AMP 2018

The 2018 Asset Management Plan for the

Town of Fort Frances

Overall Grade **D**	**Infrastructure Report Card** **The Town of Fort Frances**			
Asset Category	Asset Health (Condition)	Financial Capacity	Overall Grade	Comments
Road Network	**C**	**D**	**D**	Only 25% of the Town's Road Network is in Very Good or Good condition. The average annual capital allocation required to sustain Fort Frances's Road totals approximately **$3,266,000**. Based on Fort Frances's current annual funding of **$1,512,000**, there is an annual **deficit of $1,754,000**.
Bridges	**C**	**F**	**F**	Currently 74% of the Town's Bridges are in Very Good or Good condition. The average annual capital allocation required to sustain Fort Frances's Bridges & Culverts totals approximately **$190,000**. Based on Fort Frances's current annual funding of **$28,000** there is an annual **deficit of $162,000**.
Water System	**D**	**C**	**D**	Only 29% of the Town's Water System is in Very Good or Good condition. The average annual capital allocation required to sustain Fort Frances's Water System totals approximately **$1,464,000**. Based on Fort Frances's current annual funding of **$964,000**, there is an annual **deficit of $500,000**.
Sanitary Sewer Network	**D**	**C**	**D**	Only 24% of the Town's Sanitary Sewer Network is in Very Good to Good condition. The average annual capital allocation required to sustain Fort Frances's Sanitary Sewer Network totals approximately **$1,270,000**. Based on Fort Frances's current annual funding of **$796,000**, there is an annual **deficit of $474,000**.
Storm Sewer System	**C**	**F**	**F**	67% of the Town's Storm Sewer System is in Very Good to Good condition. The average annual capital allocation required to sustain Fort Frances's Storm Sewer System totals approximately **$998,000**. Based on Fort Frances's current annual funding of **$445,000**, there is an annual **deficit of $553,000**.

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Machinery & Equipment	**D**	**F**	**F**	Only 37% of the Town's Machinery & Equipment is in Very Good to Good condition. The average annual capital allocation required to sustain Fort Frances's Machinery & Equipment totals approximately **$333,000**. Based on Fort Frances's current annual funding of **$123,000**, there is an annual **deficit of $210,000**.
Fleet	**F**	**F**	**F**	Only 21% of the Town's Fleet are in Very Good to Good condition. The average annual capital allocation required to sustain Fort Frances's Fleet totals approximately **$385,000**. Based on Fort Frances's current annual funding of **$131,000**, there is an annual **deficit of $254,000**.
Social Housing	**C**	**F**	**F**	All of the Town's Social Housing assets are in Fair condition. The average annual capital allocation required to sustain Fort Frances's Social Housing totals approximately **$43,000**. Based on Fort Frances's current annual funding of **$6,000**, there is an annual **deficit of $37,000**.

Note: Infrastructure Report Card Rating System Description is located in Appendix A.

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1.0 Executive Summary

Municipal infrastructure provides the foundation for the economic, social and environmental health and growth of a community. We rely on infrastructure to facilitate the movement of goods and people, deliver clean drinking water and provide a high quality of life. Municipalities across Canada are responsible for ensuring that these vital services and critical infrastructure are accessible and reliable. Municipalities own and manage nearly 60% of all public infrastructure in the country. However, due to aging infrastructure and as a consequence of declining senior government grants, municipalities are struggling to meet desired levels of service. Developing a viable solution requires a strategic, innovative and sustainable solution.

As part of Public Sector Digest's (PSD) Asset Management Roadmap the Town of Fort Frances committed to taking the necessary steps towards developing a systemic, sustainable and intelligently-structured asset management program. This process involved the collaboration of PSD's industry-leading asset management team with municipal staff.

This comprehensive asset management plan (AMP) serves as the culmination of all activities undertaken as part of the Roadmap. It is an indispensable guide to asset management planning and investment into the future. Asset management is critical to extracting the highest total value from public assets at the lowest lifecycle cost. This AMP outlines both the existing state of municipal infrastructure and the Town's financial capacity to sustain existing infrastructure into the future. Furthermore, it details the outcomes of each step of the Roadmap and provides recommendations for maintaining and continuing to develop the Town's asset management program.

As analyzed in this asset management plan, the Town of Fort Frances's infrastructure portfolio comprises the following asset categories: Road Network, Bridges, Water System, Sanitary Sewer Network, Storm Sewer System, Machinery & Equipment, Fleet, and Social Housing. The replacement cost of the Town's asset portfolio is estimated to be approximately $355 million.

In recent years, staff have put a significant amount of effort into building and refining the Town's asset inventory to ensure that it represents a high level of accuracy and reliability. While much of this data has been included in the development of this Asset Management Plan there are some asset categories have been excluded until staff have full confidence in the data that is being used to inform long-term financial strategies. As a result, the Town's inventory of municipal facilities and parks will not be included in this analysis. **Section 6.9** and **6.10** provide a high-level overview of the scope of these asset categories. The Province does not require these assets to be included in the Town's Asset Management Plan until 2023. However, staff are well on track to confirming this inventory well in advance of that deadline.

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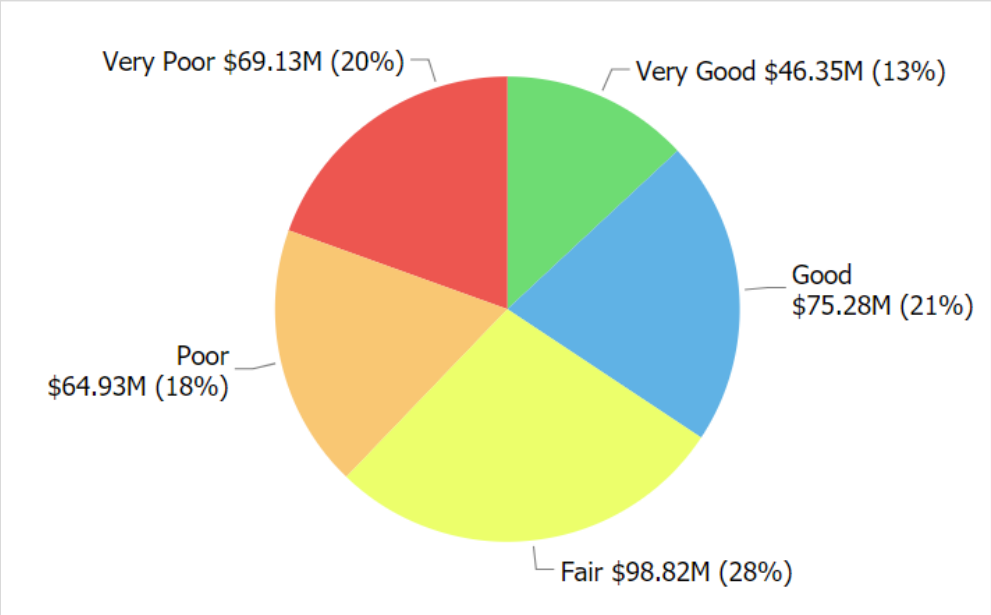
Based on updated replacement costs, and a combination of assessed and age-based condition data, 34% of assets, with a valuation of $122 million, are in Very Good to Good condition, meaning that these assets are fit for the future or adequate for now. However, 38% of municipal assets are in Poor to Very Poor condition with a valuation of $134 million, meaning that these assets are unfit for sustained service or are rapidly approaching the end of their expected service life.



Current asset condition has been made according to a combination of assessed condition data and age-based condition estimates. While municipal staff have made significant progress in collecting assessed condition data, there are still a number of asset categories that require assessment. To increase the confidence and accuracy of this information, the Town should strive to complete routine condition assessments across the entire asset portfolio on a regular cycle.

Over 70% of the assets analyzed in this AMP have at least 10 years of useful life remaining. However, 13%, with a valuation of $24 million, remain in operation beyond their estimated useful life and require immediate attention to determine a proper lifecycle strategy.

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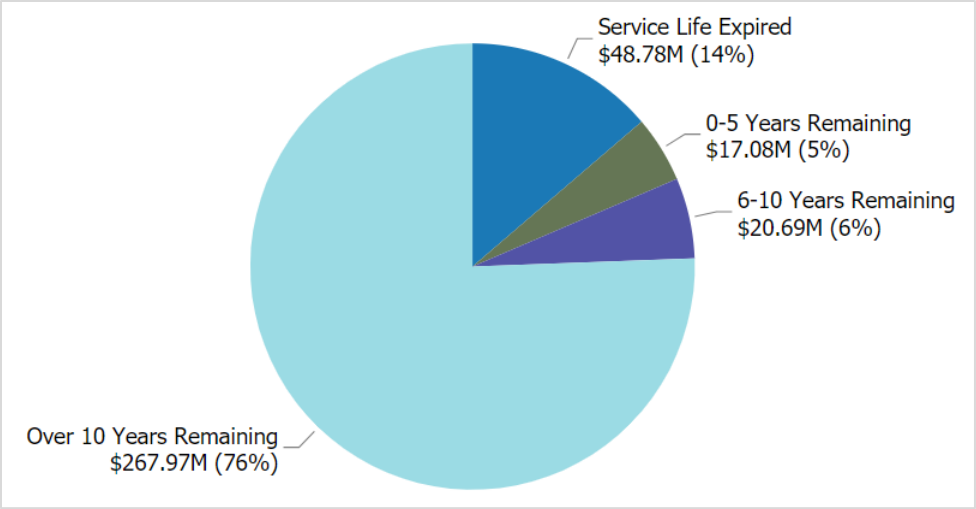

In some cases, these assets may be found to be in better condition than originally thought, and simply require the adjustment of projections about their remaining service life. In other cases, replacement or rehabilitation may be required. Municipal staff are in the process of determining appropriate asset management strategies for these high risk assets.

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

The Town's infrastructure backlog represents the investment needed today to meet previously deferred replacement needs and bring municipal assets to a state of good repair. Currently, the municipality has a combined infrastructure backlog of $47.6 million.

In order to reduce the infrastructure backlog and meet annual requirements to sustain the Town's assets, a financial strategy was developed. The following table outlines the annual infrastructure deficit identified:

Funding Source	Annual Requirement	Funding Available	Annual Deficit
Tax-Funded Assets	$5,215,000	$1,945,000	$3,270,000
Rate-Funded Assets	$2,734,000	$1,760,000	$974,000

The following table compares the total and average annual tax/rate change required to eliminate the Town's infrastructure deficit and achieve full funding across all asset categories included in the Asset Management Plan:

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Funding Source	Years Until Full Funding	Total Tax/Rate Change	Average Annual Tax/Rate Change
Tax-Funded Assets (All)	20 Years	28.1%	1.4%
Sanitary Sewer Network	15 Years	18.5%	1.2%
Water System	15 Years	18.1%	1.2%

For tax-funded assets, we recommend a 20-year plan to achieve full funding by:

a) increasing tax revenues by 1.4% each year for the next 20 years solely for the purpose of phasing in full funding to the asset categories covered in this section of the AMP
b) when realized, reallocating the debt cost reductions of $80,000
c) allocating the current gas tax and OCIF revenue as outlined
d) allocating the scheduled OCIF grant increases to the infrastructure deficit as they occur
e) increasing existing and future infrastructure budgets by the applicable inflation index on an annual basis in addition to the deficit phase-in

There are separate financial strategies for each rate-funded asset category. For the Sanitary Sewer Network, we recommend a 15-year plan to achieve full funding by:

a) increasing rate revenues by 1.2% each year for the next 15 years solely for the purpose of phasing in full funding
b) increasing future infrastructure budgets by the applicable inflation index on an annual basis

For the Water System we recommend a 15-year plan to achieve full funding by:

a) increasing rate revenues by 1.2% each year for the next 15 years solely for the purpose of phasing in full funding
b) increasing future infrastructure budgets by the applicable inflation index on an annual basis

Although our financial strategies allow the municipalities to meet its long-term funding requirements and reach fiscal sustainability, injection of additional revenues will be required to mitigate existing infrastructure backlogs.

With the release of Ontario Regulation 588/17, Ontario municipalities are responsible for implementing a wide range of asset management planning strategies and initiatives. With the completion of the Roadmap and the delivery of the AMP, the Town of Fort Frances is well-positioned to achieve regulatory compliance in advance of the timeline proposed by the Province.

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2.0 Introduction & Context

2.1 What is asset management?

Canadian municipalities are responsible for managing and maintaining a broad range of infrastructure assets for the purpose of providing value and adequate services to their citizens. This includes: roads and bridges, to facilitate movement; water, sewer and storm sewer systems to provide clean drinking water and dispose of waste or excessive rainfall; and buildings, facilities and parks to provide community and recreational spaces. The provision of these services requires a vast and costly network of infrastructure assets. 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.

Until recently, most public-sector organizations have taken an ad-hoc and informal approach to the management of infrastructure assets. Many organizations lacked a basic understanding of what they owned, where it was located, what it was worth and what condition it was in. As a result, there has been widespread mismanagement of municipal assets, often contributing to the rapid deterioration of critical infrastructure. Municipal asset management is comprised of a series of processes and practices designed to manage all assets effectively and sustainably.

The goal of a municipality engaged in asset management is to minimize the lifecycle costs of owning, operating, and maintaining assets, at an acceptable level of risk, while continuously delivering established levels of service for present and future customers. This encompasses the planning, design, construction, operation and maintenance of infrastructure used to provide municipal services. By implementing asset management processes, infrastructure needs can be prioritized over time, while ensuring timely investments to minimize repair and rehabilitation costs and maintain municipal assets now and into the future.

2.2 What are the benefits of asset management?

The Town of Fort Frances owns and manages a diverse portfolio of assets to provide residents, businesses, employees and visitors with safe access to important services, such as transportation, recreation, culture, economic development and much more. As such, it is critical that the municipality manage these assets optimally in order to produce the highest total value for taxpayers. This report will assist the municipality in the pursuit of judicious asset management of its capital assets.

Implementing the key principles and best practices of asset management can lead to a significant overhaul of organizational processes, practices and procedures. Prior to implementing these changes, an overview of the benefits of asset management is useful

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to understand why this organizational change is valuable and how it will improve outcomes for all stakeholders. The following infographic outlines why an organization should engage in the development of a robust and sustainable asset management program.

Table 1 Benefits of Asset Management

Benefits of Asset Management	
	Good governance and increased accountability
	Data-driven decision-making
	Enhanced sustainability of infrastructure
	Improved level of service and quality of life
	Accurate forecasting of infrastructure replacement and enhancement needs
	Compliance with federal and provincial regulations

2.3 What is an asset management plan?

An asset management plan (AMP) is a strategic planning document that outlines key asset data and identifies the resources and funding required to meet organizational objectives. This AMP was developed to support the Town of Fort Frances's vision for its asset management practice and programs. It provides key asset data and information about the municipality's infrastructure portfolio, asset inventory and replacement costs. This document also includes a detailed analysis of this data to determine optimized asset management strategies, the current state of infrastructure, the municipality's capital investment framework, and financial strategies to achieve fiscal sustainability while reducing and eventually eliminating funding gaps.

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

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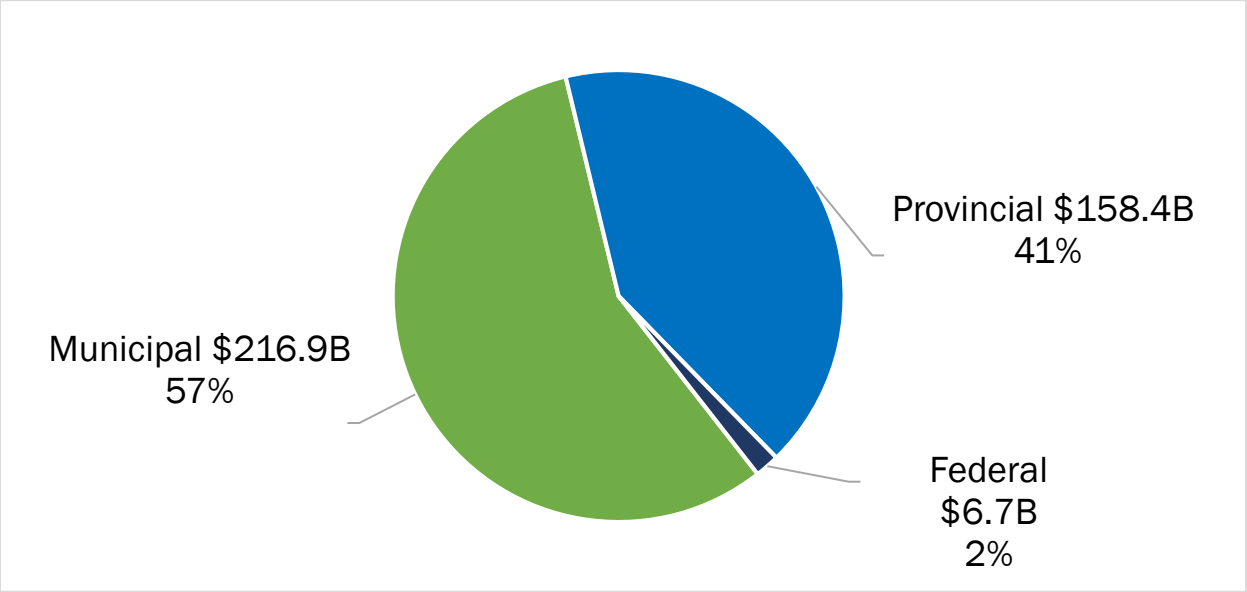
2.4 Infrastructure Ownership in Canada

Across Canada, the municipal share of public infrastructure increased from 22% in 1955 to nearly 60% in 2013. The federal government's share of critical infrastructure stock, including roads, water and wastewater, declined by nearly 80% in value since 1963.

Figure 1 Municipal Share of Public Infrastructure



Ontario's municipalities own and manage more infrastructure assets in the province than both the provincial and federal government combined. The municipality relies on these assets to provide residents, businesses, employees and visitors with safe access to important services, such as transportation, recreation, culture, economic development and much more. As such, it is critical that the municipality manage these assets optimally in order to produce the highest total value for taxpayers. This AMP will assist the municipality in the pursuit of judicious asset management of its capital assets.

2.5 Ontario Regulation 588/17

Recently, the Ontario Government has moved from incentivizing proper asset management planning – through the provision of resources like the *Building Together Guide* and asset management capacity building funding – to regulating proper asset management planning. Asset management has evolved from what began as an accounting exercise via PSAB 3150 to a holistic informed approach to infrastructure management.

Recognizing the progress that has been made to date, the Ontario Government passed the Infrastructure for Jobs and Prosperity Act (IJPA) in 2015, thereby launching the process of regulating asset management planning at the local level. As with any effort to regulate, it was important to the province to standardize planning processes while taking

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into consideration the differences in capacity and asset management maturity across municipalities. Consultations with municipal stakeholders took place over the summer months of 2016, with the province collecting feedback on its proposed regulation from municipalities of all shapes and sizes.

The update to the IJPA came into force on January 1, 2017 as O. Reg. 588/17. The requirements and their proposed timelines are listed in the following table.

Table 2 O. Reg. 588/17 Requirements

	Completion Date	Requirements
Phase 1 (Core Infrastructure Assets)	July 1, 2021	1. Current Levels of Service 2. Inventory Analysis 3. Estimated Cost and Lifecycle Activities Required to Sustain Current Levels of Service 4. **Population over 25,000**: Population and Employment Forecasts and Estimated Costs to Service Growth for the Next 10 Years
Phase 2 (All Infrastructure Assets)	July 1, 2023	1. Same Requirements as Phase 1 expanded to all infrastructure assets
Phase 3	July 1, 2024	1. Proposed Levels of Service for the Next 10 Years 2. Updated Inventory Analysis 3. Lifecycle Management Strategy 4. Financial Strategy 5. Addressing Shortfalls **6. Population Under 25,000:** Discussion of How Growth Assumptions Impacted the Lifecycle Management and Financial Strategy

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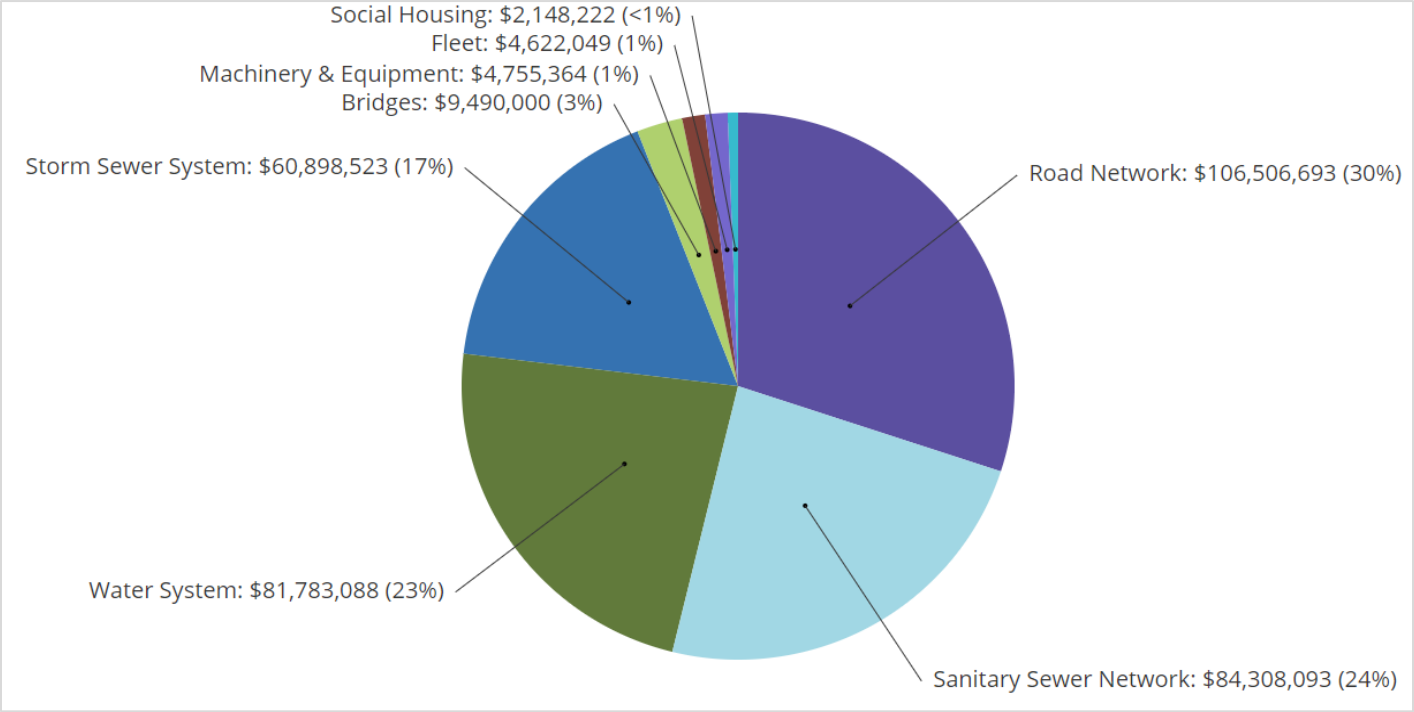
3.0 Asset Portfolio Overview

In this section, we aggregate technical and financial data across all Asset Categories analyzed in this AMP and summarize the state of the infrastructure using key asset-level and financial indicators. These indicators will provide a high-level picture of the assets that the municipality owns, historical trends in infrastructure investment and the condition and estimated useful life remaining for the municipality's assets. This data will be used as a starting point to conduct more detailed analyses on individual Asset Categories.

3.1 Asset Valuation – All Asset Categories

The asset categories analyzed in this AMP for the municipality had a total 2018 asset valuation of $355 million, of which the Road Network comprises 30%, followed by the Sanitary Sewer Network at 24%.

Figure 2 Asset Replacement Value - All Asset Categories



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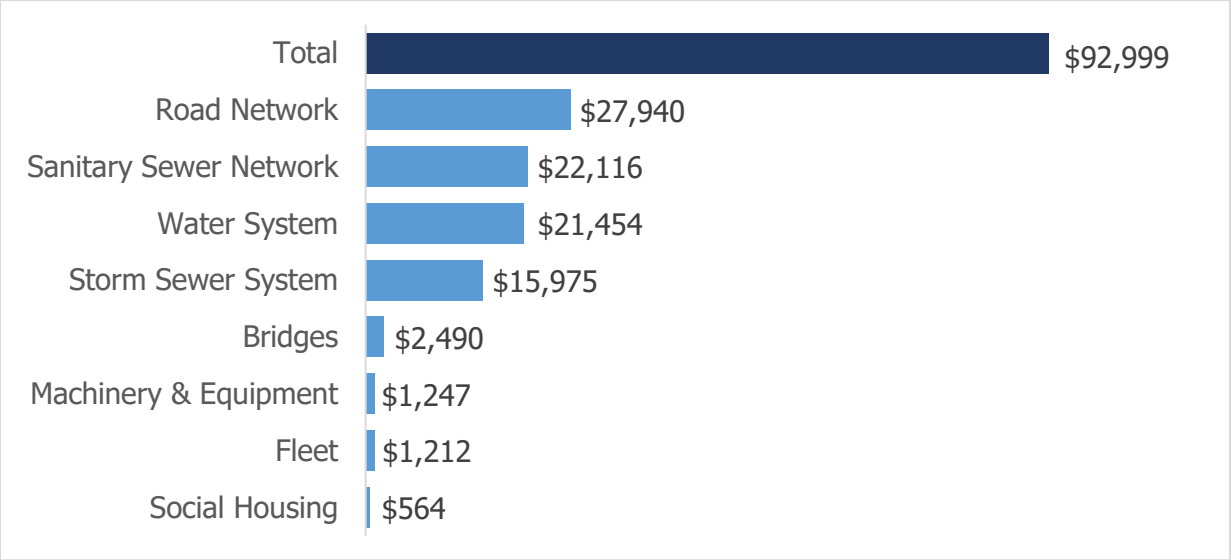
3.2 Household Asset Ownership

Asset ownership per household totals $92,999 based on 3,812 residential units.

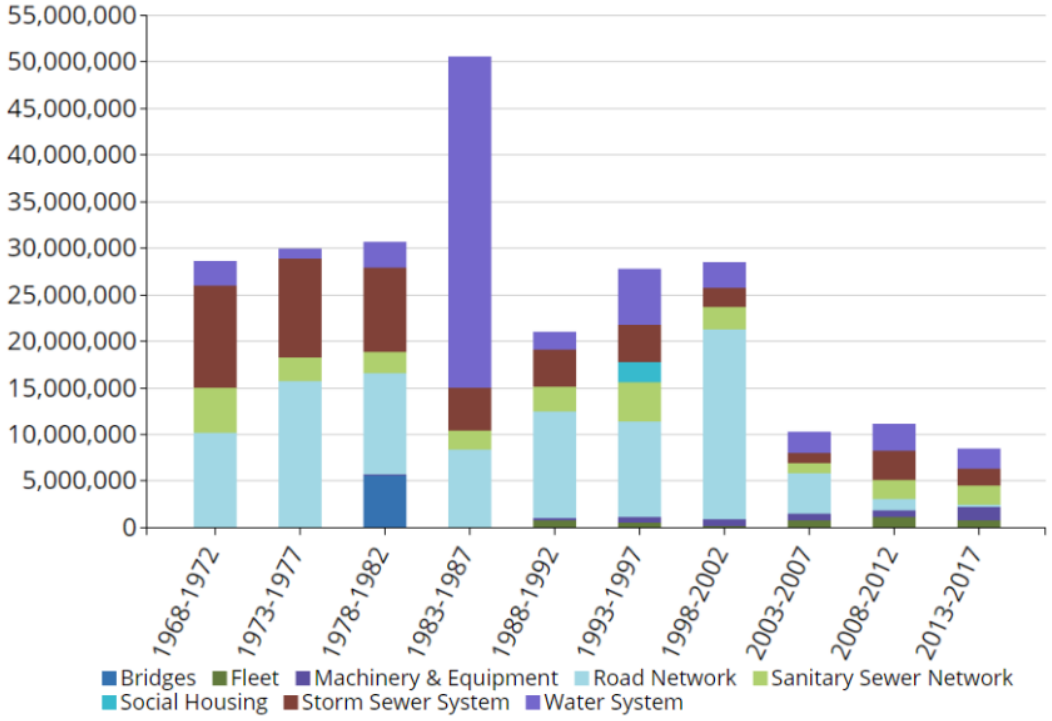
Figure 3 Household Asset Ownership – All Asset Categories



3.3 Historical Investment in Infrastructure

Using 2018 replacement costs, **Figure 4** illustrates the historical investments made in the asset categories analyzed in this AMP since 1968.

Figure 4 Historical Investment in Infrastructure - All Asset Categories



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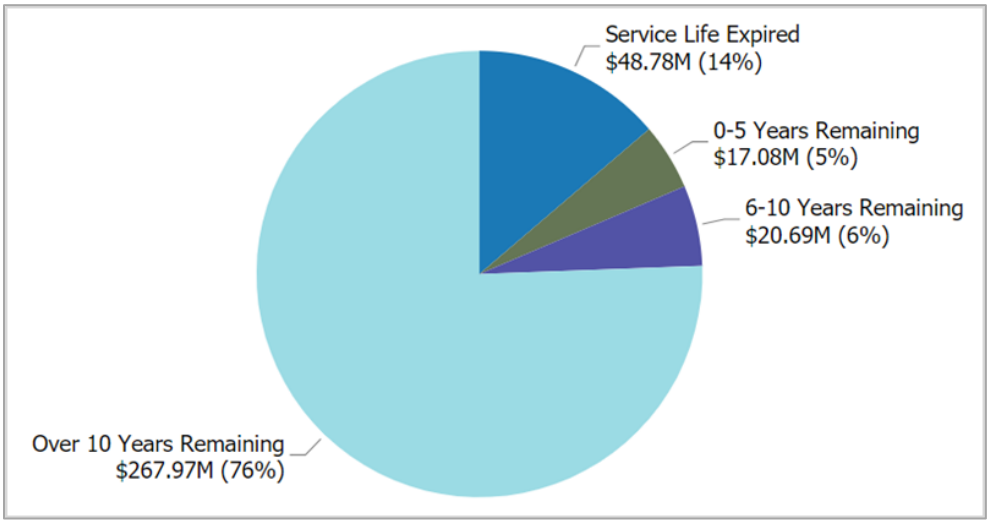
3.4 Remaining Service Life

While age is not a precise indicator of an asset's health, in the absence of assessed condition assessment data, it can serve as a high-level, meaningful approximation and help guide replacement needs and facilitate strategic budgeting.

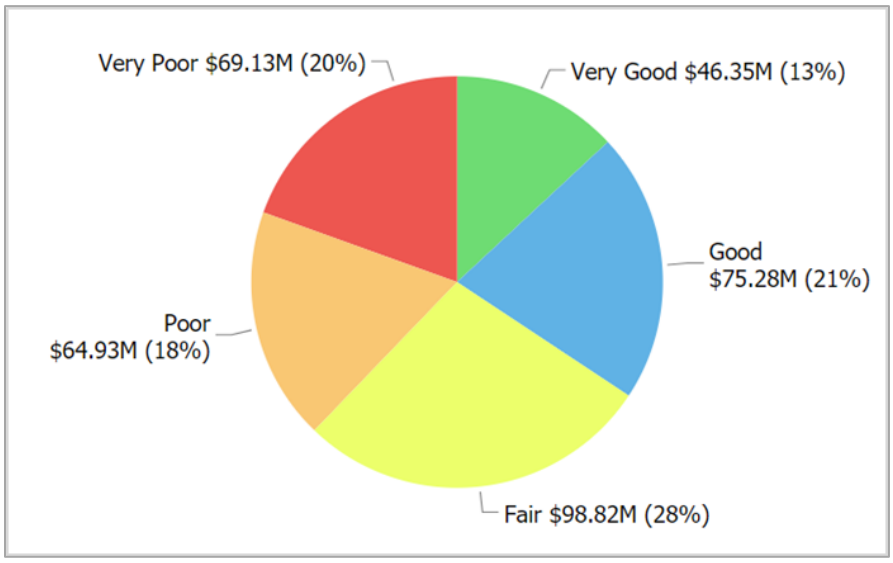
Figure 5 Remaining Service Life - All Asset Categories



3.5 Overall Asset Condition

Based on a combination of assessed and age-based condition data, 34% of assets, with a valuation of $122 million, are in Very Good to Good condition, meaning that these assets are fit for the future or adequate for now. However, 38% of municipal assets are in Poor to Very Poor condition with a valuation of $134 million, meaning that these assets are unfit for sustained service or are approaching the end of their expected service life.

Figure 6 Asset Condition – All Asset Categories



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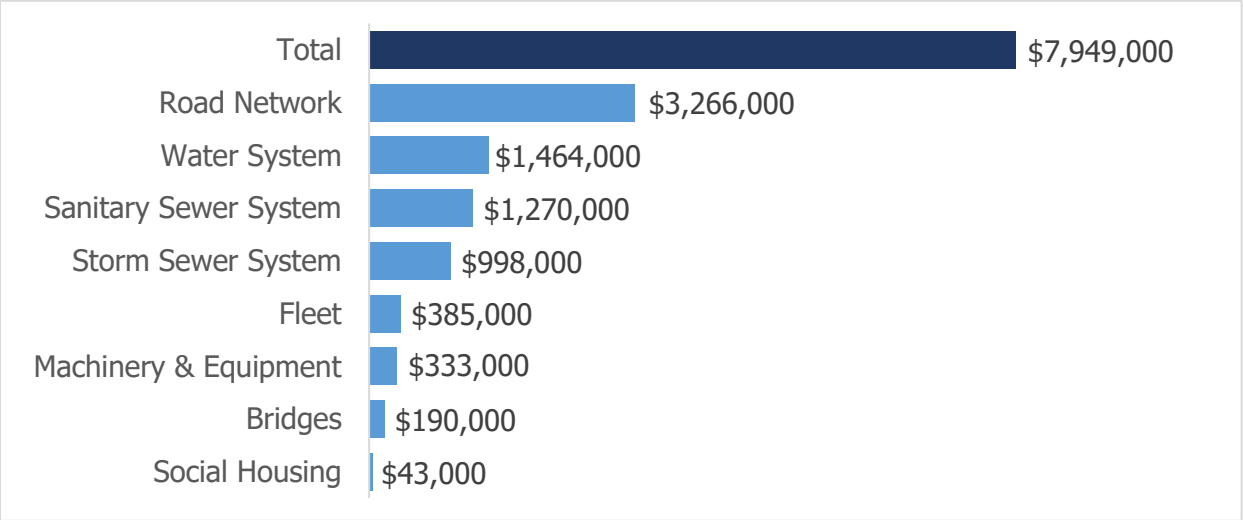
4.0 Financial Overview

4.1 Annual Requirements

The annual requirements represent the amount the municipality should allocate annually to each of its Asset Categories to meet replacement needs as they arise, prevent infrastructure backlogs and achieve long-term sustainability. In total, the municipality must allocate approximately $7.9 million annually to address capital requirements for the assets included in this AMP.

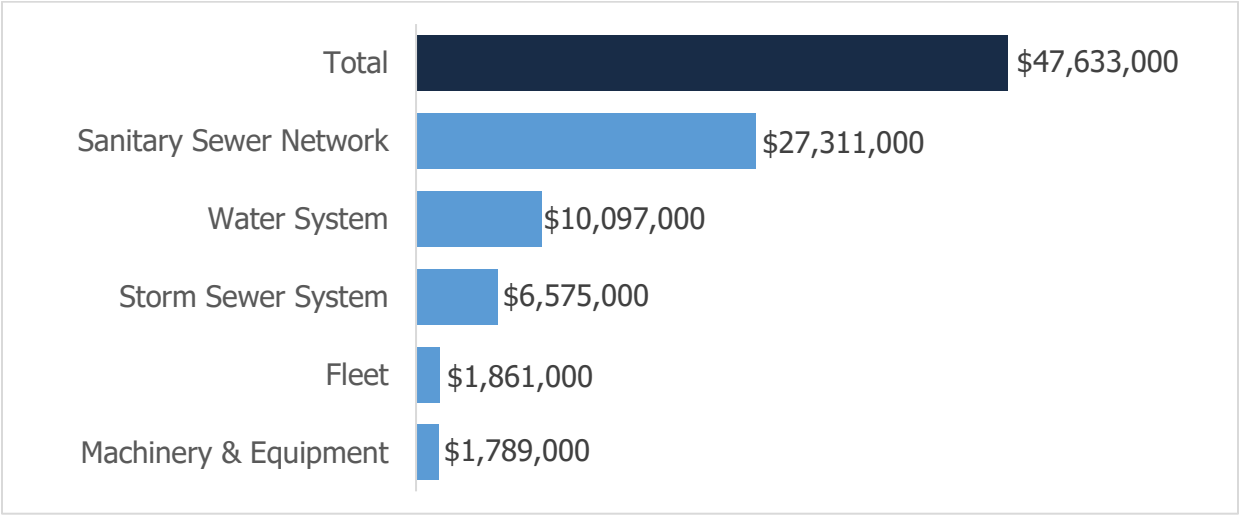
Figure 7 Annual Requirements by Asset Category



4.2 Infrastructure Backlog

The municipality has a combined infrastructure backlog of $47.6 million. The backlog represents the investment needed today to meet previously deferred replacement needs.

Figure 8 Infrastructure Backlog - All Asset Categories



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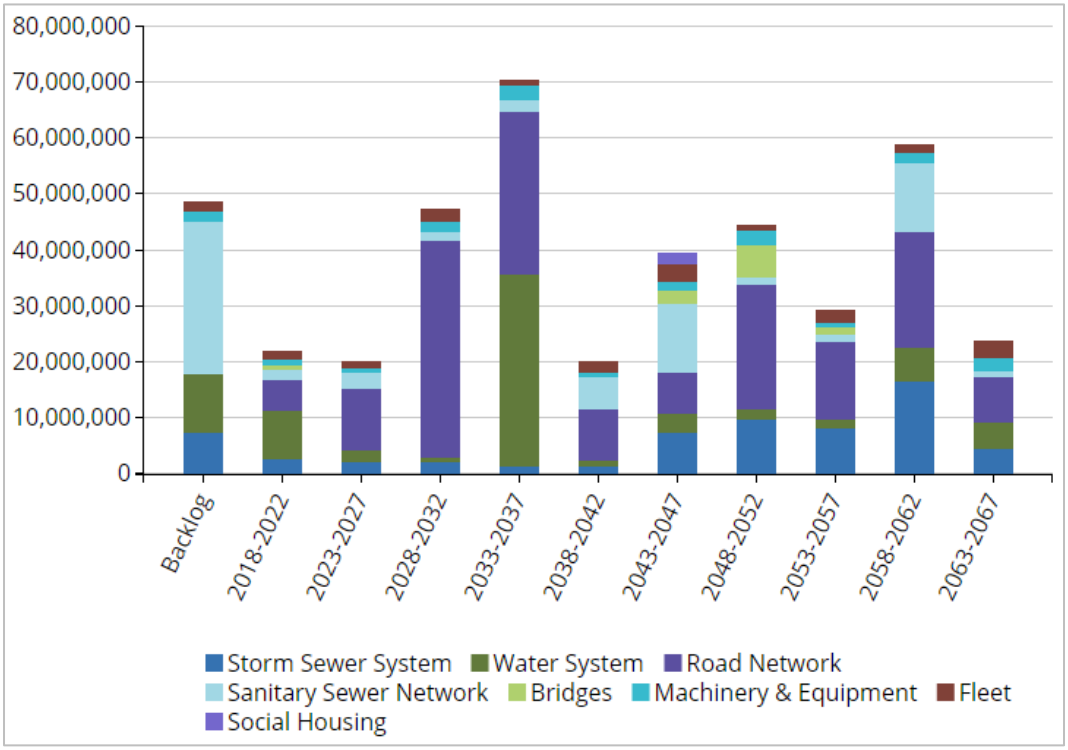
4.3 Asset Replacement Requirements

In this section, we illustrate the aggregate short-, medium-, and long-term infrastructure spending requirements for each asset category in the AMP. The backlog is the total investment in infrastructure that was deferred over previous years or decades. In the absence of observed data, the backlog represents the value of assets that remain in operation beyond their useful life.

Figure 9 Replacement Profile - All Asset Categories – End-of-Life Replacement & Lifecycle Activities



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5.0 Data and Methodology

The municipality's dataset for the asset categories analyzed in this AMP are maintained in a centralized asset inventory. This inventory includes key asset attributes and financial data, such as historical costs, in-service dates, field inspection data, asset health, and replacement costs.

5.1 Condition Data

Assets deteriorate in condition over time. Municipalities generally implement a straight-line amortization approach to model the deterioration of their capital assets and use age-based data to estimate an asset's remaining useful life. However, this approach is often a poor representation of an asset's actual condition and rate of deterioration. In the absence of condition data and customized deterioration curves, age-based estimates can be a useful approximation of when future field intervention activities and investment is required.

As available, actual field condition data was used to make recommendations more meaningful and representative of the municipality's state of infrastructure. The value of condition data cannot be overstated as it provides a more accurate representation of the state of infrastructure than does age alone.

As part of PSD's Roadmap, the Town was encouraged to collect condition data for as many assets as possible. Town staff were provided with condition assessment guidelines to ensure the consistent and uniform collection of data in addition to data gathering templates to store all assessed data for upload to the main asset inventory.

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Source of Condition Data by Asset Category **Table 3** provides an overview of the source of condition data used in the development of this AMP.

Table 3 Source of Condition Data – All Asset Categories

Asset Category	Segment	Source of Condition Data
Road Network	Paved Roads	100% Assessed
Bridges	All	100% Assessed
Water System	All	Age-based
Sanitary Sewer Network	Sanitary Mains	47% Assessed
	All Others	Age-based
Storm Sewer System	All	Age-based
Machinery & Equipment	All	Age-based
Fleet	All	Age-based
Social Housing	All	Age-based

Capturing assessed condition is far more critical for core Asset Categories (roads, bridges, water, sewer, storm etc.) than for non-core Asset Categories (Fleet, Machinery & Equipment, IT etc.). For the purposes of the Roadmap, the municipality focused on collecting condition data for only core Asset Categories. In the future, the municipality may wish to perform more detailed condition assessments on minor asset categories.

5.2 Asset Attribute Data

While asset condition data is perhaps the most important piece of data to collect, additional asset data is required to support asset management strategy development and decision-making. Asset attribute data provides greater context and clarity to the state of an asset and allows for the development of robust risk and lifecycle management strategies to prioritize projects and ultimately extend the life of assets.

Table 4 lists the asset attributes that PSD recommends collecting for core Asset Categories and the percentage of data available in the CityWide database for each attribute. This only includes core linear asset categories.

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Table 4 Asset Attribute Data – Core Asset Categories

Asset Category	Asset Attribute	% Completion in Asset Inventory
Road Network (Paved Roads)	Surface Width (m)	**100%**
	Length (m)	**100%**
	Road Class	**100%**
	Surface Material	**100%**
	Design Class	**94%**
Water System (Water Mains)	Length (m)	**100%**
	Pipe Diameter (mm)	**100%**
	Material	**100%**
Sanitary Sewer Network (Sanitary Mains)	Length (m)	**100%**
	Material	**100%**
	Pipe Diameter (mm)	**100%**
Storm Sewer System (Storm Mains)	Length (m)	**100%**
	Pipe Diameter (mm)	**97%**
	Material	**99%**

5.3 Financial Data

In this AMP, the average annual requirement is the amount, based on current replacement costs, that the Town should set aside annually so that assets can be replaced upon reaching the end of their lifecycle.

To determine current funding capacity, all existing sources of funding are identified and combined to enumerate the total available funding. These figures are then assessed against the average annual requirements, and are used to calculate the annual funding shortfall and additional financial strategies.

In addition to the annual shortfall, the majority of municipalities face significant infrastructure backlogs. The infrastructure backlog is the accrued financial investment needed in the short-term to bring the assets to a state of good repair. This amount is identified for each asset category.

5.3.1 Replacement Costs

Developing an asset investment strategy requires an estimation of the cost to replace assets that have reached the end of their service life. The replacement cost considers the

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replacement of an asset with a similar, but not necessarily identical, asset available in the current marketplace.

There are a range of methods to determine asset replacement costs – some more accurate and reliable than others.

- **Cost/Unit** – Cost is based on replacement cost/unit provided by the municipality
- **User-Defined Cost** – Cost is based on replacement costs provided by the municipality
- **CPI/NRBCPI** – Historical cost is inflated based on Consumer Price Index tables
- **Flat Rate Inflation** – Historical cost is inflated by the same percentage each year up to the current year

5.3.2 Source of Replacement Cost by Asset Category

Table 5 provides an overview of the source of replacement costs for major components within each asset category.

Table 5 Source of Replacement Cost - All Asset Categories

Asset Category	Asset Segment	Replacement Cost Source
Road Network	Paved Roads	100% Cost/Unit
Bridges	Bridges	100% User-Defined Cost
Water System	All	100% Cost/Unit
Sanitary Sewer Network	All	99% Cost/Unit 1% CPI
Storm Sewer System	Storm Sewer Mains	99% Cost/Unit 1% User-Defined Cost
Machinery & Equipment	All	87% CPI 13% User-Defined Cost
Fleet	All	96% CPI 4% User-Defined Cost
Social Housing	All	100% CPI

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5.4 Limitations and Assumptions

Several limitations continue to persist as municipalities advance their asset management practices:

- As available, we use field condition assessment data to illustrate the state of infrastructure and develop the requisite financial strategies. However, in the absence of observed data, we rely on the age of assets and their estimated useful life to estimate their physical condition.

- A second limitation is the use of inflation measures, for example using CPI/NRBCPI to inflate historical costs in the absence of actual replacement costs. While a reasonable approximation, the use of such multipliers may not be reflective of market prices and may over- or understate the value of a municipality's infrastructure portfolio and the resulting capital requirements.

- Our calculations and recommendations will reflect the best available data at the time this AMP was developed.

- The focus of this plan is restricted to capital expenditures and does not capture O&M (operating and maintenance) expenditures on infrastructure.

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6.0 State of Local Infrastructure

The State of Local Infrastructure provides a summary of Fort Frances's asset portfolio in 2018. This overview is divided into the following sections within each asset category:

Asset Inventory & Replacement Cost

The asset inventory contains a comprehensive list of all capital assets, which are organized by **Category** and **Segment**.

Categories include groups of assets that provide similar services to the community (E.g. Road Network, Water System, Machinery & Equipment)

Segments are divided into groups of assets that perform similar functions within each Category (e.g. Hydrants, Standpipes, Water Connections, Water Mains).

Developing an asset investment strategy requires an estimation of the cost to replace assets that have reached the end of their service life. The replacement cost considers replacement of the modern equivalent asset with similar (but not necessarily identical) assets which are available for procurement.

The asset inventory listing in each Category includes the following details for each Segment:

1. **Quantity –** unit of measure (kilometres, metres, units etc.)

2. **Replacement Cost Method** – describes how the replacement cost was determined using one of the following methods:
    a. Cost/Unit – Cost is based on replacement cost/unit provided by the municipality
    b. User-Defined Cost – Cost is based on replacement costs provided by the municipality
    c. CPI Tables – Historical cost of assets is inflated based on the Consumer Price Index or the Non-residential Building Construction Price Index

3. **Replacement Cost** – the total estimated cost to replace the asset

Current Asset Condition

As available, actual field condition data has been used to make recommendations more meaningful and representative of the Town's current state of infrastructure. The value of this condition data cannot be overstated as it provides a more accurate representation of the state of infrastructure than does age alone.

This section identifies whether each segment's condition data is based on assessed condition or age-based estimates of condition. It also identifies each segment's average condition rating and the percentage of service life remaining

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This AMP uses the following rating scale to determine asset condition, developed as part of the Canadian Infrastructure Report Card.

Table 6 Canadian Infrastructure Report Card - Rating Scale for Asset Condition

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

Table 7 identifies how the CIRC condition rating scale has been adapted to determine the current condition of each of the Municipality's assets. These ranges align with the condition rating criteria used in the completion of either internal or external assessments of the Township's assets. Assets that have not had condition assessments completed according to a documented condition rating criterion have their condition estimated based on their age and estimated useful life. Age-based condition estimates rely on the percentage of service life remaining as a proxy to determine current condition.

Table 7 Condition Rating Criteria by Asset Type

	Paved Roads	Water, Sanitary, Storm Mains	All Others
	% of Service Life Remaining	**% of Service Life Remaining**	**% of Service Life Remaining**
Very Good	85-100	90-100	80-100
Good	70-84	75-89	60-79
Fair	50-69	60-74	40-59
Poor	30-49	40-59	20-39
Very Poor	0-29	0-40	0-19

Estimated Useful Life & Average Age

Once an asset begins its service life it is generally expected that it will deteriorate over time and eventually require replacement. To plan for future asset replacement a municipality must identify, to the best of their ability, when replacement will be required.

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To estimate asset replacement requirements each asset is assigned an Estimated Useful Life. This value quantifies the period over which the municipality expects the asset to be available for use and remain in-service before requiring replacement or disposal. The determination of the useful life of an asset requires an element of judgment and needs appropriately qualified personnel to make the assessment.

Each asset is assigned an Estimated Useful Life according to the length of time that an asset is expected to remain in-service before requiring full replacement. This section identifies the Estimated Useful Life for each Segment in addition to the average age of assets that are currently in-service.

This section also includes the average age of assets by Segment. This data is based on the In-Service Dates provided for each asset in the Town's asset inventory.

The collection of assessed condition data can further augment the expected Service Life Remaining. Once condition is assessed it is often found that an asset may last longer, or perhaps shorter than originally estimated. This assessed condition data can either extend or decrease the Service Life Remaining for a given asset.

Risk & Criticality

With a limited amount of capital funding available to municipalities, staff must regularly make decisions about which lifecycle activities are required and which can be deferred at the lowest risk to the organization.

Ensuring that capital spending is allocated to the assets and projects with the highest risk of failure requires the development of a risk model that provides a quantitative risk rating for each asset.

For the purposes of this analysis:

$$Risk = Probability\ of\ Failure(PoF) \times Consequence\ of\ Failure(CoF)$$

This section identifies the data that has been used to determine the risk rating that has been assessed for each asset.

The risk matrix included in this section provide a visual representation of the level of risk in each asset category. Individual assets are grouped based on both their Consequence of Failure (1-5) and Probability of Failure (1-5). The assets located closer to the bottom-left of the matrix (green boxes) are less likely to fail and have lesser consequences for the municipality if they do fail. The assets located closer to the top-right of the matrix (red boxes) are at the greatest risk of failure and will have far greater consequences for the municipality if they do.

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Lifecycle Management

In this section, the lifecycle management strategy for each asset category has been identified. This details the municipality's approach to the maintenance, rehabilitation and replacement of existing infrastructure.

This can include both asset specific strategies where detailed lifecycle strategies are defined for an entire asset type, or more general strategies for the management of the entire category of assets.

Forecasted Capital Requirements

In this section, we illustrate the short, medium, and long-term infrastructure spending requirements for the Town's infrastructure.

For the asset categories which do not yet have lifecycle strategies developed, this graph will only include the cost of end-of-life replacement events. It is presumed that these assets will simply be replaced once they reach the end of their estimated useful life.

The asset categories that include assets with lifecycle management strategies will include the cost of capital rehabilitation events in addition to the cost of end-of-life replacement events.

The year-range of each graph is adjusted to include at least one full lifecycle of all assets within the asset category.

Appendix B includes the lifecycle activities that would need to be undertaken for each of the next ten years to maintain the current level of service. However, these tables do not include medium- and long-term capital requirements to replace infrastructure that will require attention beyond this ten-year period.

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6.1 Road Network

6.1.1 Asset Inventory & Replacement Cost

The following table provides the quantity and total replacement cost of the Town's Road Network inventory. Gravel and surface treated roads have been included as they comprise a significant portion of the Town's road network. However, the lifecycle management strategies for these assets consist of perpetual maintenance activities and do not require capital costs for rehabilitation activities or end-of-life replacement. These operational costs will not be considered in the financial strategy for this AMP.

All replacement costs/unit have been determined based on average costs incurred as part of recent engineering contracts.

Table 8 Asset Inventory - Road Network

Asset Segment	Quantity	Replacement Cost Method	Total Replacement Cost
Paved Roads	632,165 m^2	Cost/Unit	$106,506,693
Surface Treatment	100,671 m^2	Not Planned for Replacement	n/a
Unpaved	56,142 m^2	Not Planned for Replacement	n/a
		Total:	**$106,506,693**

6.1.2 Current Asset Condition

The following table details the source of condition data as well as the average condition rating and the average percentage of service life remaining for each asset type.

Table 9 Current Asset Condition - Road Network

Asset Segment	Condition Source	Average Condition	% of Service Life Remaining
Paved Roads	Internal Assessment (2017)	Fair	61%
Surface Treatment	Internal Assessment (2017)	Fair	45%
Unpaved	Internal Assessment (2017)	Fair	46%
	Overall:	**Fair**	**58%**

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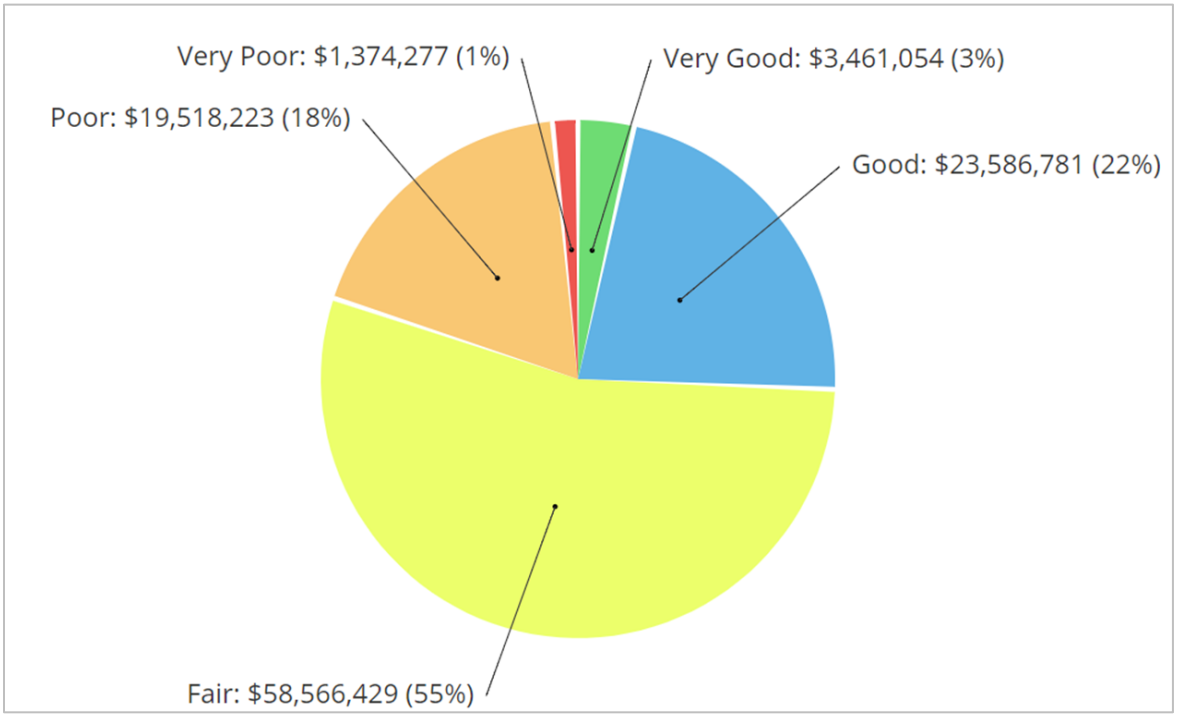
Figure 10 Current Asset Condition - Road Network



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

6.1.3 Estimated Useful Life & Average Age

The estimated useful life for Road Network assets has been assigned according to a combination of established industry standards and staff knowledge.

Table 10 Service Life Remaining - Road Network

Asset Segment	Estimated Useful Life	Average Service Life Remaining
Paved Roads	30 Years	15 Years
Surface Treatment	20 Years	11 Years
Unpaved	20 Years	10 Years

The following pie chart identifies the percentage of assets, by replacement value, that have surpassed their estimated service life and how close all other assets are to approaching their projected replacement date.

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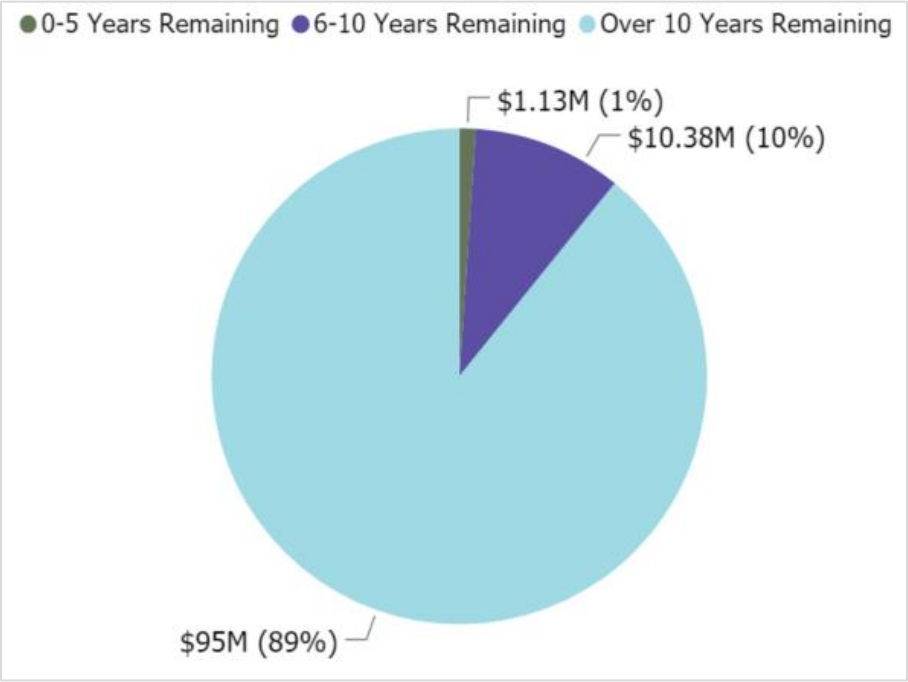
Figure 11 Service Life Remaining - Road Network



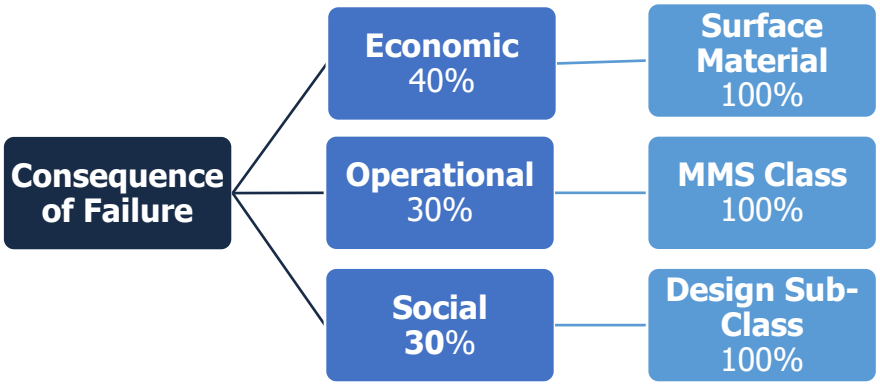
6.1.4 Risk & Criticality

Probability of Failure

The following hierarchy identifies the risk parameters used to calculate the probability of failure for the Road Network.

Consequence of Failure

The following hierarchy identifies the risk parameters used to calculate the consequence of failure for the Road Network.



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Risk Matrix

Using the above risk parameters, the following matrix visualizes the risk rating for the road network by multiplying the consequence and the probability of failure.

6.1.5 Lifecycle Management

Paved Roads

As paved roads represent a significant portion of the Town's overall asset portfolio a number of lifecycle strategies have been developed with the goal of lifecycle cost optimization in mind. By intervening at the right time in a paved roads life and completing maintenance and rehabilitation activities, staff believe that they can extend the life of these assets and achieve the lowest total cost of ownership. The following strategies have been developed and applied to paved road surfaces.

Table 11 Asphalt HL4 – Lifecycle Strategy

Event Name	Event Type	Age at Event
Crack Sealing	Maintenance	10 Years
Double Surface Treatment	Rehabilitation	20 Years
Crack Sealing	Maintenance	30 Years
Crack Sealing	Maintenance	40 Years
End-of-Life Replacement	Replacement	50 Years

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Figure 12 Asphalt HL4 – Lifecycle Strategy

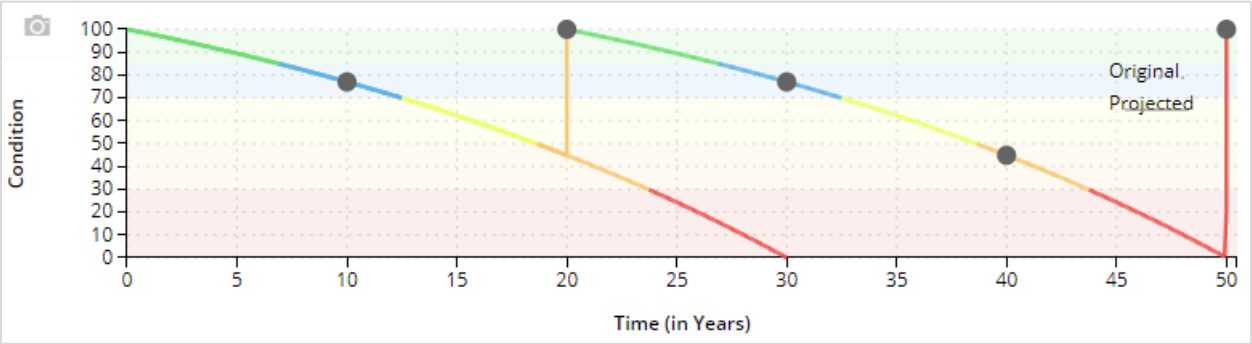
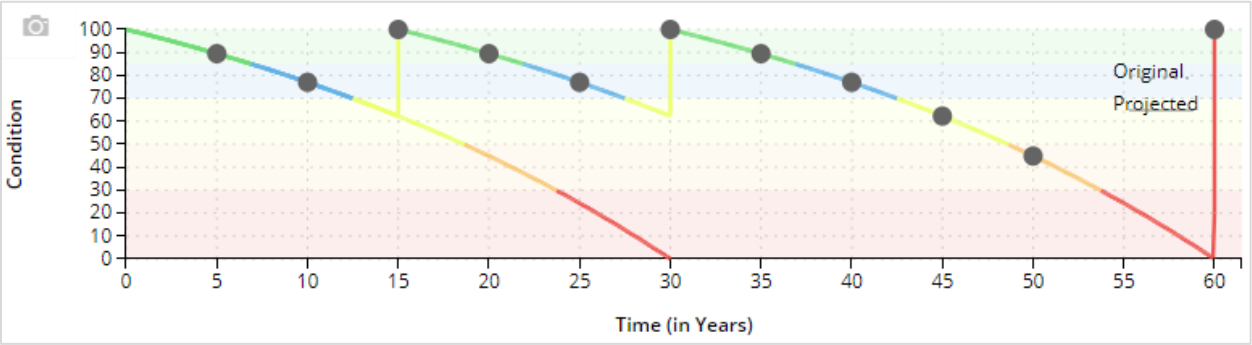


Table 12 Asphalt Superpave – Lifecycle Strategy

Event Name	Event Type	Age at Event
Crack Sealing	Maintenance	5 Years
Crack Sealing	Maintenance	10 Years
Single Surface Treatment	Rehabilitation	15 Years
Crack Sealing	Maintenance	20 Years
Crack Sealing	Maintenance	25 Years
Double Surface Treatment	Rehabilitation	30 Years
Crack Sealing	Maintenance	35 Years
Crack Sealing	Maintenance	40 Years
Crack Sealing	Maintenance	45 Years
Crack Sealing	Maintenance	50 Years
End-of-Life Replacement	Replacement	60 Years

Figure 13 Asphalt Superpave – Lifecycle Strategy



As the Town's understanding of the current cost, risk and performance of their assets evolve, these strategies should be reviewed to determine whether they are achieving the lowest total cost of ownership while still achieving the expected level of service.

6.1.6 Forecasted Capital Requirements

The following bar chart forecasts the capital requirements which include both the cost of rehabilitation and replacement events for the Town's Road Network.

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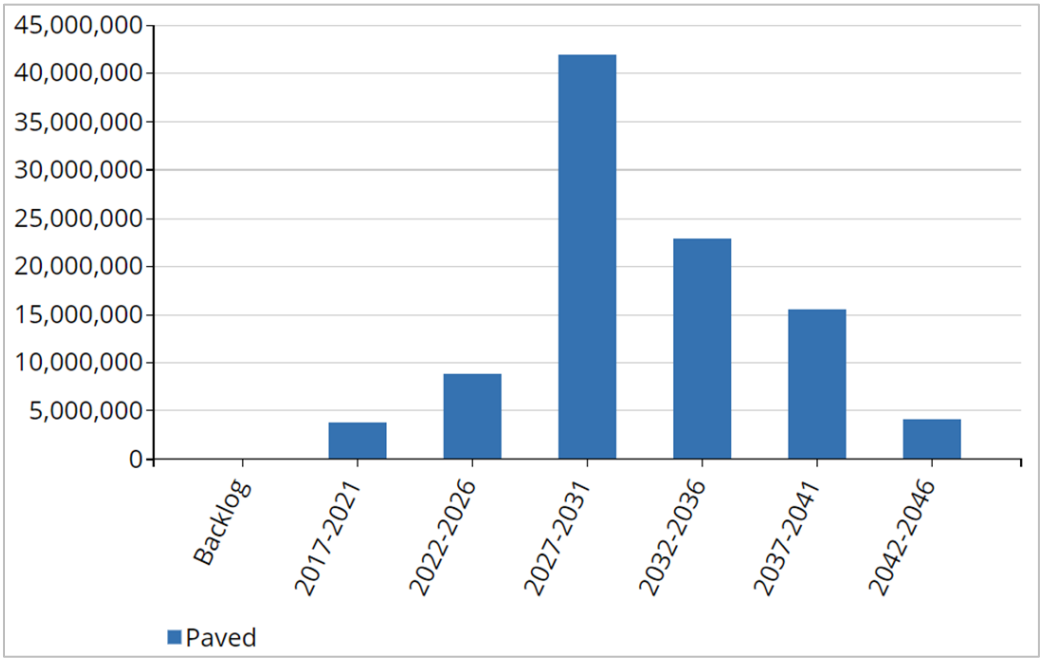
Figure 14 Forecasted Capital Requirements - Road Network



The projected capital expenditures that will need to be undertaken over the next 10 years to maintain the current levels of service can be found in Appendix B.

6.1.7 Recommendations

1. Consider expanding the Road Network inventory to include roadside appurtenances (signs, streetlights, guiderails, curb and gutter) and sidewalks

2. Continue internal condition assessment program for road surfaces according to a routine assessment schedule

3. As the Town's understanding of the probability and consequence of asset failure changes, the risk assessment framework for the Road Network should be adjusted accordingly. This may include the addition of new data or the re-weighting of existing parameters.

4. Current levels of service should be measured according to the technical and community levels of service metrics established by the Town in Section **8.1.7** and **8.1.8**

5. The municipality is underfunding its long-term requirements on an annual basis. See **Section 9.0** for a detailed financial strategy designed to achieve long-term funding requirements.

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6.2 Bridges

6.2.1 Asset Inventory & Replacement Cost

The following table provides the quantity and total replacement cost of the Town's Bridges inventory. All user-defined costs have been determined based on the results of the Town's most recent OSIM inspection.

Table 13 Asset Inventory - Bridges

Asset Segment	Quantity	Replacement Cost Method	Total Replacement Cost
Caul Bridge	1 unit	User-Defined Cost	$1,370,000
CN Underpass	1 unit	User-Defined Cost	$2,430,000
Mill Road Overpass	1 unit	User-Defined Cost	$5,690,000
		Total:	**$9,490,000**

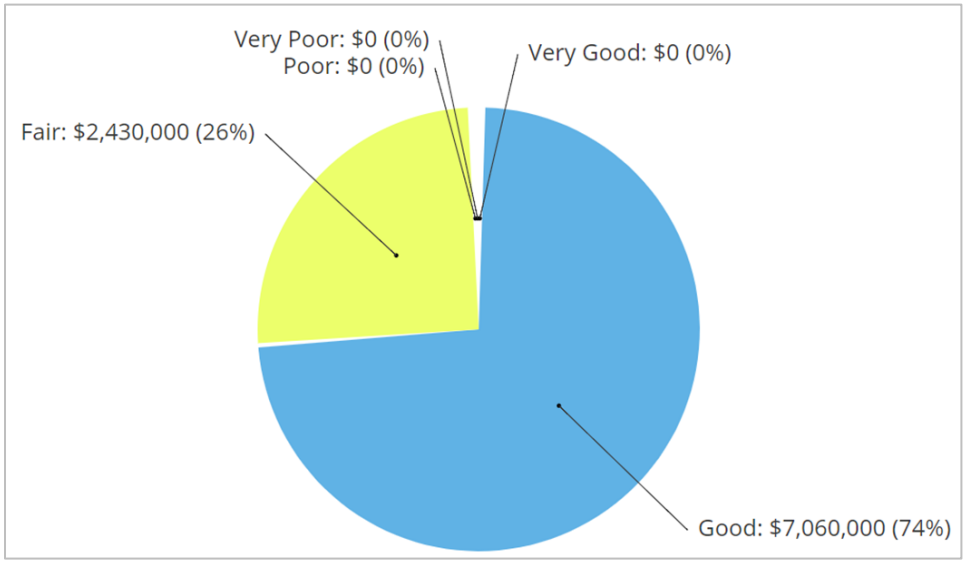
6.2.2 Current Asset Condition

The following table details the source of condition data as well as the average condition rating and the average percentage of service life remaining for each asset type.

Table 14 Current Asset Condition - Bridges

Asset Segment	Condition Source	Average Condition	% of Service Life Remaining
Caul Bridge	External Assessment (2017 OSIM)	Good	70%
CN Underpass	External Assessment (2017 OSIM)	Fair	55%
Mill Road Overpass	External Assessment (2017 OSIM)	Good	65%
	Overall:	**Good**	**64%**

Figure 15 Current Asset Condition - Bridges



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

6.2.3 Estimated Useful Life & Average Asset Age

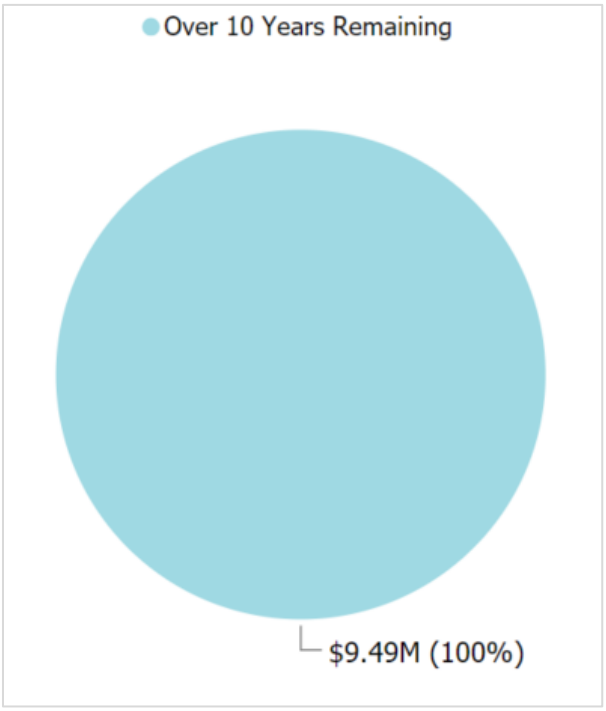
The estimated useful life for Bridges has been assigned according to a combination of established industry standards and staff knowledge.

Table 15 Service Life Remaining - Bridges

Asset Segment	Estimated Useful Life	Average Service Life Remaining
Caul Bridge	50 Years	35 Years
CN Underpass	50 Years	28 Years
Mill Road Overpass	50 Years	32 Years

The following pie chart identifies the percentage of assets, by replacement value, that have surpassed their estimated service life and how close all other assets are to approaching their projected replacement date.

Figure 16 Service Life Remaining - Bridges



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6.2.4 Risk & Criticality

Probability of Failure

The following hierarchy identifies the risk parameters used to calculate the probability of failure for Bridges.

Consequence of Failure

The following hierarchy identifies the risk parameters used to calculate the consequence of failure for Bridges.

Risk Matrix

Using the above risk parameters, the following matrix visualizes the risk rating for each asset by multiplying the consequence and the probability of failure.

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6.2.5 Lifecycle Management

The following lifecycle management strategies identify the current approach of Public Works staff to maintenance, rehabilitation and replacement of existing infrastructure. These strategies have been determined to be an effective management approach to maintain the current level of service expected by the community.

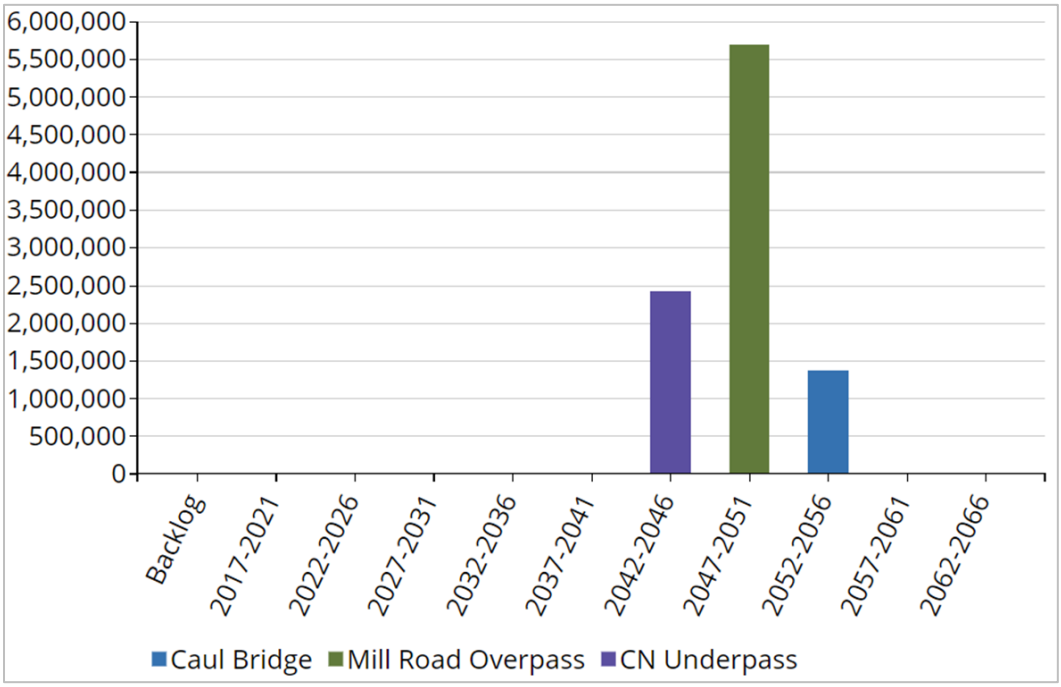
In Ontario, the Ontario Structure Inspection Manual dictates how regularly municipal bridges and culverts with a span of over 3 metres should be inspected. Every 2 years municipalities are required to have a licensed structure inspector perform a detailed inspection of each structure that meets the criteria. Upon the completion of this biannual inspection the municipality is provided with a report detailing the current condition of each structure and the lifecycle activities required to maintain, rehabilitate or even replace when necessary.

Town staff rely on the findings in this report to identify required lifecycle activities over short- and long-term timeframes. These inspections will continue, and staff will endeavour to carry out all recommended lifecycle activities according to the inspection report provided.

6.2.6 Forecasted Capital Requirements

The following bar chart forecasts the capital requirements for the replacement of the Town's Bridges.

Figure 17 Forecasted Capital Requirements - Bridges



The projected capital expenditures that will need to be undertaken over the next 10 years to maintain the current levels of service can be found in Appendix B.

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6.2.7 Recommendations

1. The Town should continue to inspect Bridges with a span greater than or equal to 3 metres every two years according to the requirements outlined in the Ontario Structure Inspection Manual

2. As condition assessments are completed, this data should be uploaded into the asset inventory and be incorporated into asset management planning and decision-making

3. The lifecycle management strategy for Bridges should continue to be driven by the recommendations by the engineers that complete routine OSIM inspections

4. As the Town's understanding of the probability and consequence of asset failure changes, the risk assessment framework for Bridges should be adjusted accordingly. This may include the addition of new data or the re-weighting of existing parameters.

5. Current levels of service should be measured according to the technical and community levels of service metrics established by the Town in **Section 8.1.7** and **8.1.8**

6. The municipality is underfunding its long-term requirements on an annual basis. See **Section 9.0** for a detailed financial strategy designed to achieve long-term funding requirements.

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6.3 Water System

6.3.1 Asset Inventory & Replacement Cost

The following table provides the quantity and total replacement cost of the Town's Water System.

The replacement cost/units for water mains, hydrants and water valves have been determined based on average costs incurred as part of recent engineering contracts. Water mains and valves have been assigned a per metre replacement cost based on the pipe material and diameter that it is expected to be replaced with.

Table 16 Asset Inventory - Water System

Asset Segment	Quantity	Replacement Cost Method	Total Replacement Cost
Hydrants	366 units	Cost/Unit	$8,001,163
Water Mains	70,564 m	Cost/Unit	$38,956,967
Water Tower	1 unit	CPI Tables	$4,720,758
Water Treatment Plant	1 unit	CPI Tables	$27,047,811
Water Valves	710 units	Cost/Unit	$3,056,389
		Total:	**$81,783,088**

6.3.2 Current Asset Condition

The following table details the source of condition data as well as the average condition rating and the average percentage of service life remaining for each asset type.

Table 17 Current Asset Condition - Water System

Asset Segment	Condition Source	Average Condition	% of Service Life Remaining
Hydrants	Age-based	Poor	32%
Water Mains	Age-based	Poor	56%
Water Tower	Age-based	Fair	44%
Water Treatment Plant	Age-based	Poor	35%
Water Valves	Age-based	Poor	34%
	Overall:	**Poor**	**42%**

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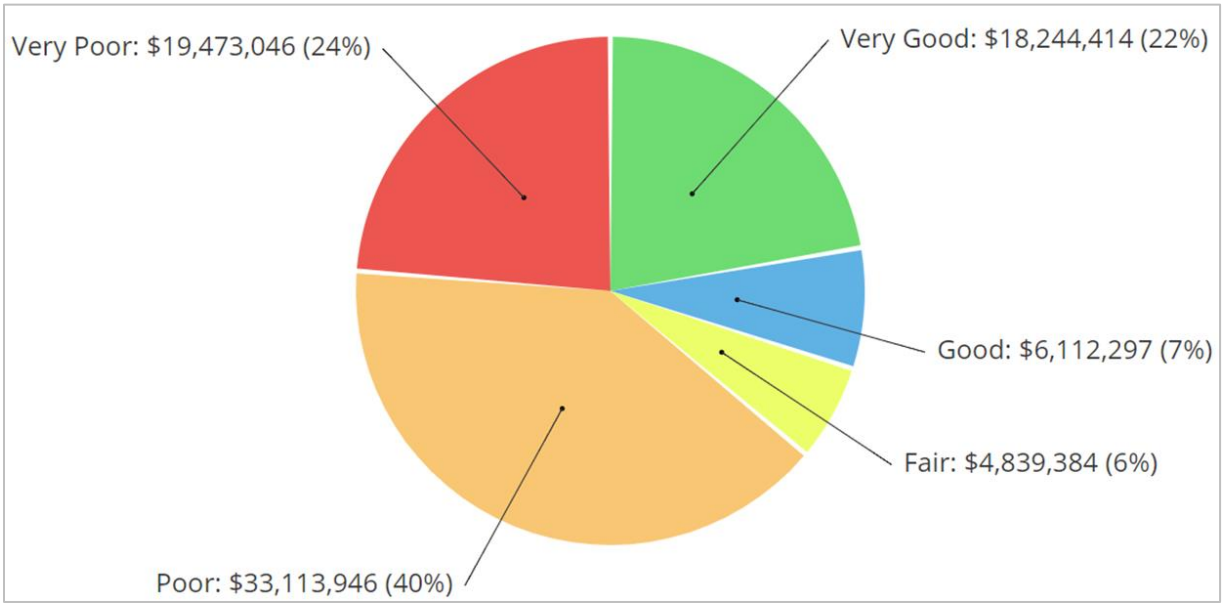
Figure 18 Current Asset Condition - Water System



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

6.3.3 Estimated Useful Life & Average Asset Age

The estimated useful life for Water System has been assigned according to a combination of established industry standards and staff knowledge.

Table 18 Service Life Remaining - Water System

Asset Segment	Estimated Useful Life	Average Service Life Remaining
Hydrants	40 Years	9 Years
Water Mains	50-80 Years	37 Years
Water Tower	50 Years	22 Years
Water Treatment Plant	50 Years	17 Years
Water Valves	40 Years	3 Years

The following pie chart identifies the percentage of assets, by replacement value, that have surpassed their estimated service life and how close all other assets are to approaching their projected replacement date.

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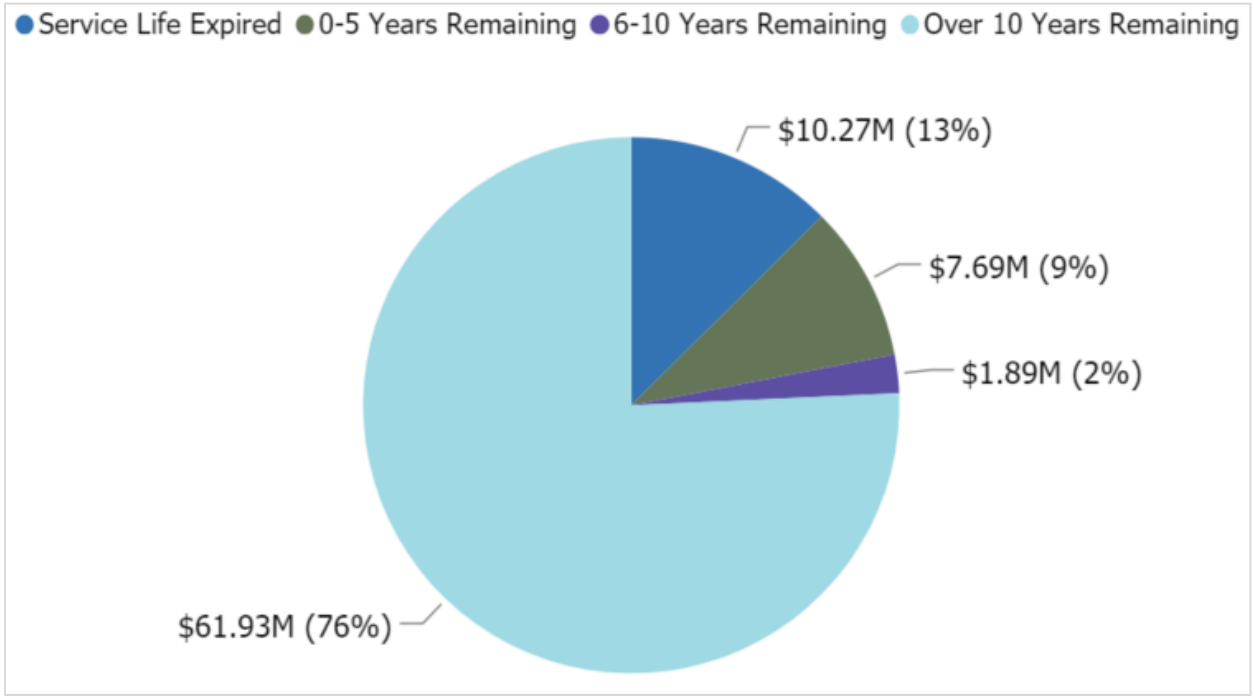
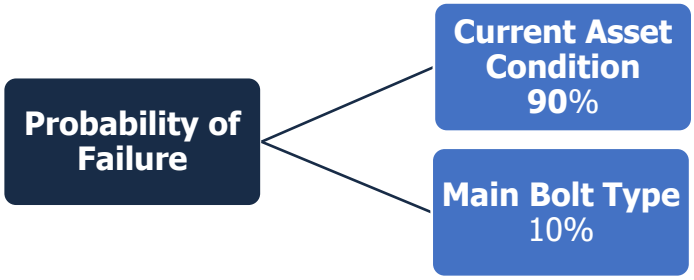
Figure 19 Service Life Remaining - Water System



6.3.4 Risk & Criticality

Probability of Failure

The following hierarchy identifies the risk parameters used to calculate the probability of failure for water mains.



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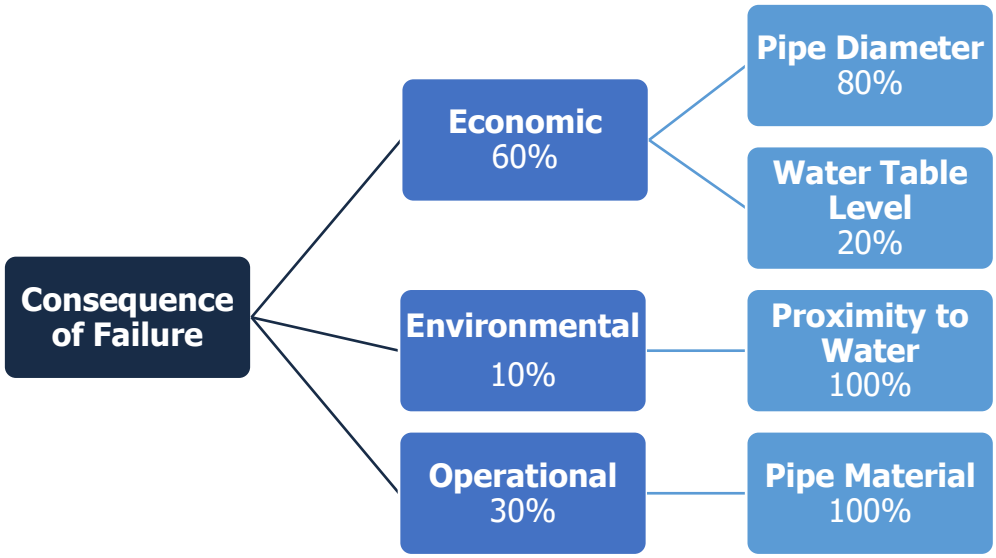
Consequence of Failure

The following hierarchy identifies the risk parameters used to calculate the consequence of failure for water mains.



Risk Matrix

Using the above risk parameters, the following matrix visualizes the risk rating for each asset by multiplying the consequence and the probability of failure.

Consequence	Probability 1	2	3	4	5
5	0 Assets - $0	0 Assets - $0	0 Assets - $0	0 Assets - $0	0 Assets - $0
4	7 Assets 1,224 m $877,891	0 Assets - $0	0 Assets - $0	0 Assets - $0	0 Assets - $0
3	17 Assets 890 m $646,256	5 Assets 1,072 m $749,272	0 Assets - $0	1 Asset 205 m $127,699	4 Assets 919 m $573,630
2	307 Assets 30,822 m, unit(s) $17,026,064	25 Assets 3,648 m $1,942,507	5 Assets 1,520 m $778,616	81 Assets 12,524 m $6,575,761	57 Assets 11,498 m $6,448,469
1	70 Assets 5,726 m, unit(s) $2,949,942	1 Asset 130 m $66,626	1 Asset 68 m $34,686	2 Assets 196 m $98,899	1 Asset 122 m $60,650

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6.3.5 Lifecycle Management

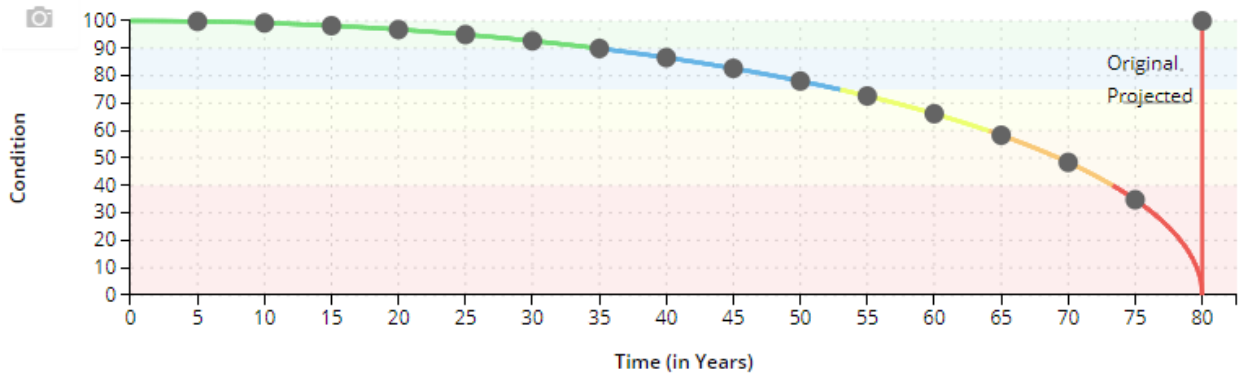
The Town of Fort Frances has outlined its approach to water infrastructure maintenance, rehabilitation and renewal as part of its Drinking Water Quality Management System (DWQMS) Operational Plan. It has been prepared to meet the requirements of the Municipal Drinking Water Licensing Program and the Safe Drinking Water Act.

The Town's water system consists of several sections of 2-bolt water mains. This main type is considered to have a higher probability of failure. To address the potential adverse impacts of failure, the Town is exploring available treatment options that minimize cost, risk and impacts to service performance.

With the scarcity of contractors available to the Town that offer trenchless re-lining services for water mains, the Town's current strategy consists primarily of maintenance events (flushing) to ensure that service disruptions are minimized.

Table 19 Water Mains - Lifecycle Strategy

Event Name	Event Type	Age at Event
Flushing	Maintenance	Every 5 Years
End-of-life Replacement	Replacement	80 Years



As the Town's understanding of the current cost, risk and performance of their assets evolve, these strategies should be reviewed to determine whether they are achieving the lowest total cost of ownership while still achieving the expected level of service.

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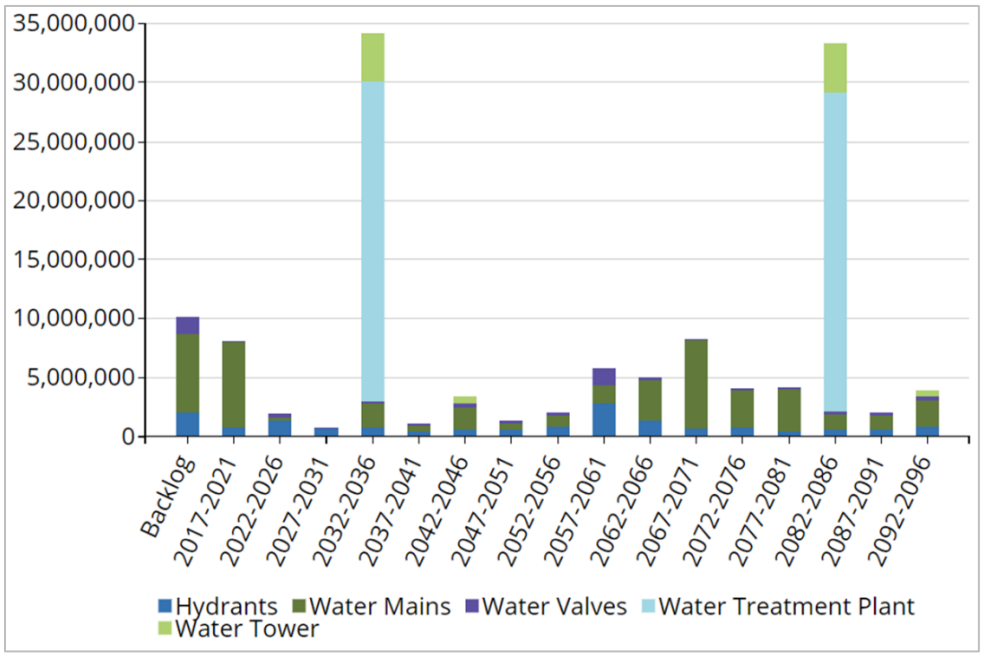
6.3.6 Forecasted Capital Requirements

The following bar chart forecasts the capital requirements for the replacement of the Town's Water System.

Figure 20 Forecasted Capital Requirements - Water System



The projected capital expenditures that will need to be undertaken over the next 10 years to maintain the current levels of service can be found in Appendix B.

6.3.7 Recommendations

1. The Town should continue to update the DWQMS to ensure that the Water System meets all regulatory requirements. Where deficiencies and opportunities are identified, the Town should identify a lifecycle management strategy that combines maintenance, rehabilitation and replacement activities that aim to maintain the current level of service provided.

2. As the Town's understanding of the probability and consequence of asset failure changes, the risk assessment framework for the Water System should be adjusted accordingly. This may include the addition of new data or the re-weighting of existing parameters.

3. Current levels of service should be measured according to the technical and community levels of service metrics established by the Town in **Section 8.1.7** and **8.1.8**

4. The municipality is underfunding its long-term requirements on an annual basis. See **Section 9.0** for a detailed financial strategy designed to achieve long-term funding requirements.

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6.4 Sanitary Sewer Network

6.4.1 Asset Inventory & Replacement Cost

The following table provides the quantity and total replacement cost of the Town's Sanitary Sewer Network.

The replacement cost/unit for sewer mains, manholes and valves has been determined based on average costs incurred as part of recent engineering contracts. Sewer mains and valves have been assigned a per metre replacement cost based on the pipe material and diameter that it is expected to be replaced with.

Table 20 Asset Inventory - Sanitary Sewer Network

Asset Segment	Quantity	Replacement Cost Method	Total Replacement Cost
Lift Stations	6 units	CPI Tables	$2,149,323
Sanitary Manholes	630 units	Cost/Unit	$15,046,448
Sanitary Sewer Mains	57,249 m	Cost/Unit	$54,062,423
Sanitary Valves	16 units	Cost/Unit	$129,866
Treatment Plant	1 unit	CPI Tables	$12,920,034
		Total:	**$84,308,093**

6.4.2 Current Asset Condition

The following table details the source of condition data as well as the average condition rating and the average percentage of service life remaining for each asset type.

Table 21 Current Asset Condition - Sanitary Sewer Network

Asset Segment	Condition Source	Average Condition	% of Service Life Remaining
Lift Stations	Age-based	Fair	50%
Sanitary Manholes	Age-based	Very Poor	12%
Sanitary Sewer Mains	Assessed (2013-2017) & Age-based	Poor	46%
Sanitary Valves	Age-based	Poor	38%
Treatment Plant	Age-based	Very Poor	0%[1]
	Overall:	**Poor**	**30%**

[1] With recent rehabilitation efforts, the actual condition of the Wastewater Treatment Plant is expected to be much better than "Very Poor". In the absence of available assessed condition data, this report relies on the age-based condition of the facility. Once assessed condition data is available the Town will integrate this data into future iterations of its AMP.

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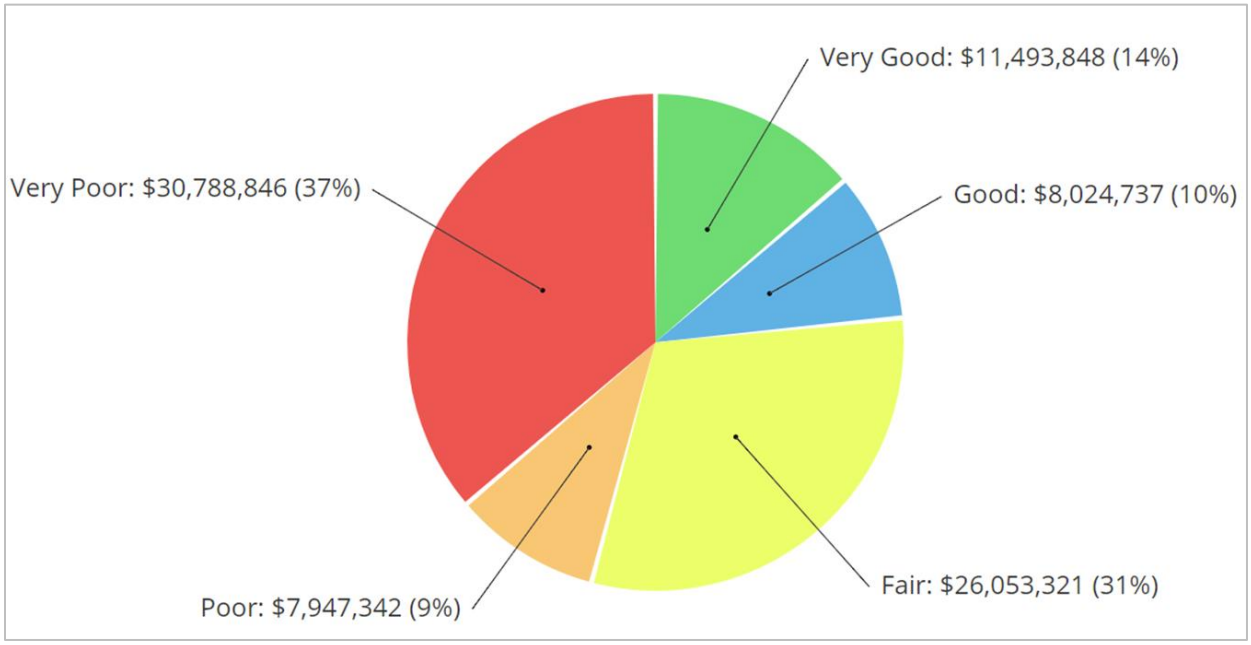
Figure 21 Current Asset Condition - Sanitary Sewer Network



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

6.4.3 Estimated Useful Life & Average Asset Age

The estimated useful life for Sanitary Sewer Network has been assigned according to a combination of established industry standards and staff knowledge.

Table 22 Service Life Remaining - Sanitary Sewer Network

Asset Segment	Estimated Useful Life	Average Service Life Remaining
Lift Stations	50 Years	25 Years
Sanitary Manholes	40 Years	(13 Years)
Sanitary Sewer Mains	80 Years	28 Years
Sanitary Valves	40 Years	7 Years
Treatment Plant	50 Years	(4 Years)

The following pie chart identifies the percentage of assets, by replacement value, that have surpassed their estimated service life and how close all other assets are to approaching their projected replacement date.

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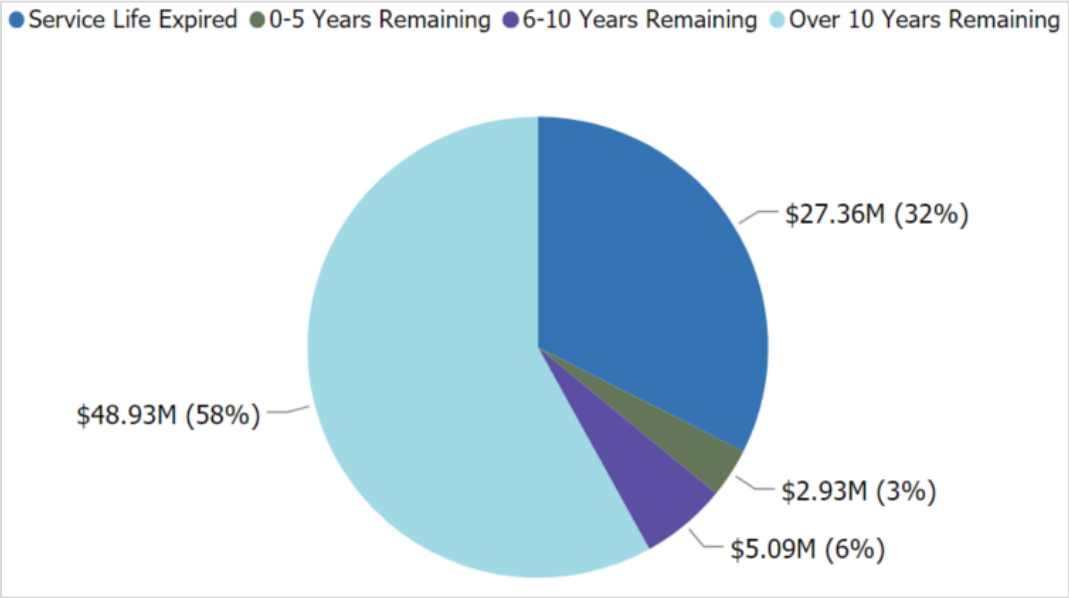
Figure 22 Service Life Remaining - Sanitary Sewer Network



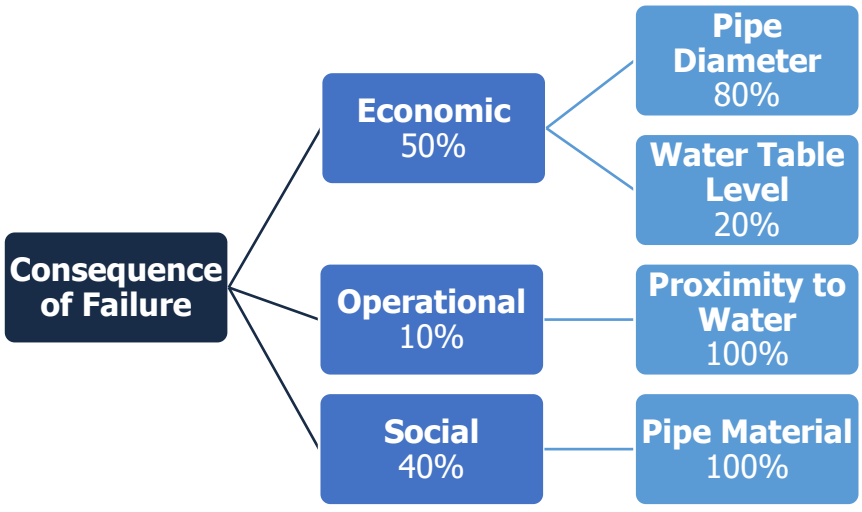
6.4.4 Risk & Criticality

Probability of Failure

The following hierarchy identifies the risk parameters used to calculate the probability of failure for all Sanitary Sewer Network assets.

Consequence of Failure

The following hierarchy identifies the risk parameters used to calculate the consequence of failure for Sanitary Sewer Mains.



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Risk Matrix

Using the above risk parameters, the following matrix visualizes the risk rating for each asset by multiplying the consequence and the probability of failure.

6.4.5 Lifecycle Management

The Town's lifecycle management strategy for the Sanitary Sewer Network includes maintenance, rehabilitation and renewal events. The following lifecycle strategy has been developed for sanitary sewer mains and incorporated into this AMP to help forecast capital requirements over the short-, medium- and long-term:

Table 23 Lifecycle Strategy - Sanitary Sewer Mains

Event Name	Event Type	Age at Event
Flushing & Cleaning	Maintenance	Every 5 Years
CCTV Inspection	Preventative Maintenance	Every 10 Years
Re-lining	Rehabilitation	80 Years
End-of-life Replacement	Replacement	160 Years

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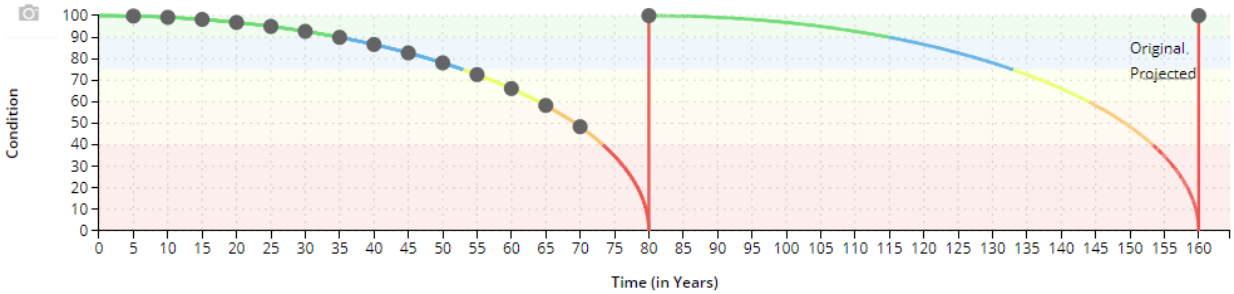
Figure 23 Lifecycle Strategy - Sanitary Sewer Mains

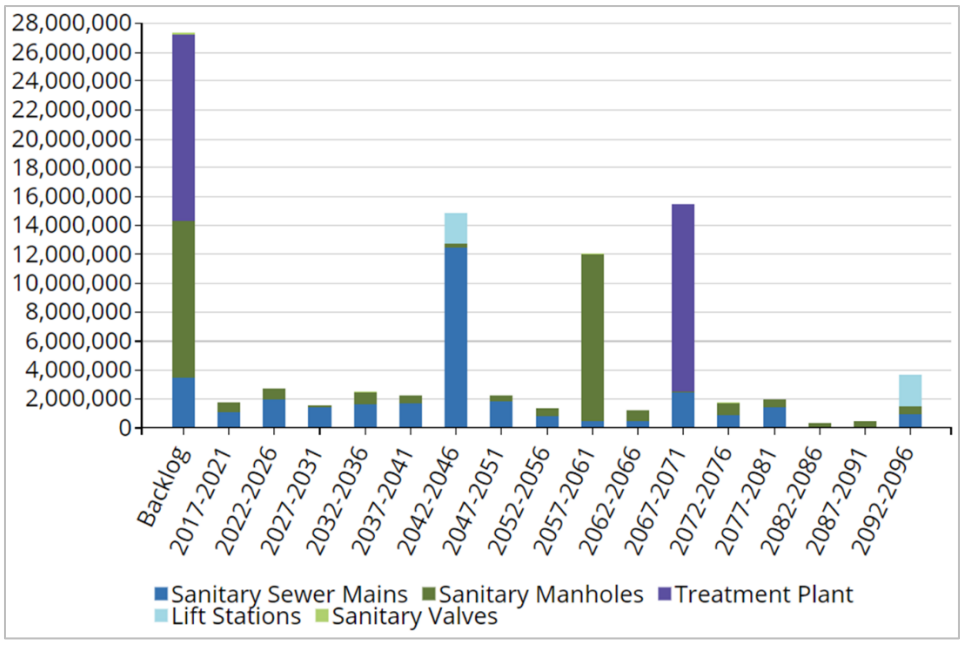


As the Town's understanding of the current cost, risk and performance of their assets evolve, these strategies should be reviewed to determine whether they are achieving the lowest total cost of ownership while still achieving the expected level of service.

6.4.6 Forecasted Capital Requirements

The following bar chart forecasts the capital requirements for rehabilitation and replacement of the Town's Sanitary Sewer Network.

Figure 24 Forecasted Capital Requirements - Sanitary Sewer Network



The projected capital expenditures that will need to be undertaken over the next 10 years to maintain the current levels of service can be found in Appendix B.

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6.4.7 Recommendations

1. The Town's CCTV inspection strategy (every 10 years) should include an assessed condition value for each inspected pipe segment. This assessed condition value should be uploaded into the centralized asset registry to increase the accuracy and reliability of long-term needs forecasting

2. Due to the presence of a large backlog, the Town may consider accelerating the condition assessment program through the use of zoom-camera technology – a cheaper alternative that could quickly provide updated condition across the entire sanitary sewer main network

3. As the Town's understanding of the probability and consequence of asset failure changes, the risk assessment framework for the Sanitary Sewer Network should be adjusted accordingly. This may include the addition of new data or the re-weighting of existing parameters.

4. Current levels of service should be measured according to the technical and community levels of service metrics established by the Town in **Section 8.1.7** and **8.1.8**

5. The municipality is underfunding its long-term requirements on an annual basis. See **Section 9.0** for a detailed financial strategy designed to achieve long-term funding requirements.

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6.5 Storm Sewer System

6.5.1 Asset Inventory & Replacement Cost

The following table provides the quantity and total replacement cost of the Town's Storm Sewer System.

The replacement cost/unit for all storm sewer system components except for lift stations has been determined based on average costs incurred as part of recent engineering contracts. Storm sewer mains, catch basin leads, ditch inlets and outfalls have been assigned a per metre replacement cost based on the pipe material and diameter that it is expected to be replaced with.

Table 24 Asset Inventory - Storm Sewer System

Asset Segment	Quantity	Replacement Cost Method	Total Replacement Cost
Catchbasin Leads	9987 m	Cost/Unit	$4,623,255
Catchbasin Manholes	373 units	Cost/Unit	$5,713,640
Catchbasins	892 units	Cost/Unit	$5,416,697
Ditch Inlets	557 m	Cost/Unit	$405,939
Lift Stations	1 unit	CPI Tables	$399,381
Outfalls	1950 m	Cost/Unit	$1,752,386
Storm Mains	38495 m	Cost/Unit	$36,336,143
Storm Manholes	317 units	Cost/Unit	$6,251,082
		Total:	**$60,898,523**

6.5.2 Current Asset Condition

The following table details the source of condition data as well as the average condition rating and the average percentage of service life remaining for each asset type.

Table 25 Current Asset Condition - Storm Sewer System

Asset Segment	Condition Source	Average Condition	% of Service Life Remaining
Catchbasin Leads	Age-based	Good	60%
Catchbasin Manholes	Age-based	Very Poor	19%
Catchbasins	Age-based	Poor	23%
Ditch Inlets	Age-based	Poor	25%
Lift Stations	Age-based	Very Good	87%
Outfalls	Age-based	Fair	42%
Storm Mains	Age-based	Good	85%
Storm Manholes	Age-based	Poor	22%
	Overall:	**Fair**	**45%**

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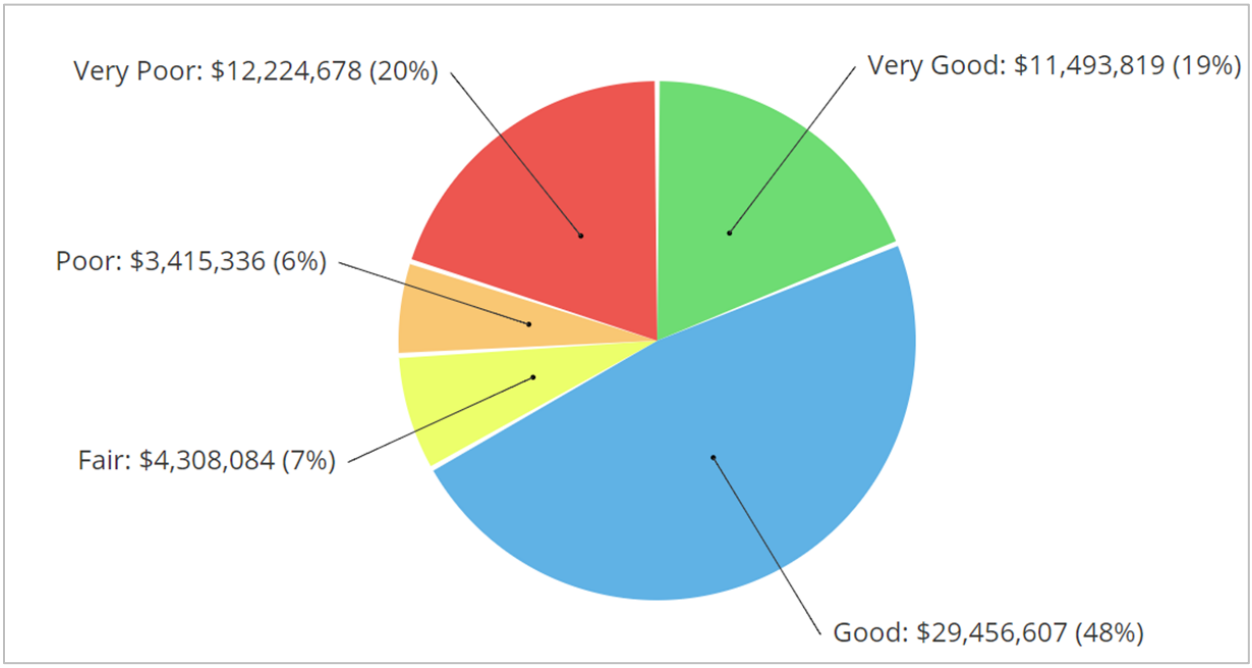
Figure 25 Current Asset Condition - Storm Sewer System



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

6.5.3 Estimated Useful Life & Average Asset Age

The estimated useful life for Storm Sewer System has been assigned according to a combination of established industry standards and staff knowledge.

Table 26 Service Life Remaining - Storm Sewer System

Asset Segment	Estimated Useful Life	Average Service Life Remaining
Catchbasin Leads	80 Years	48 Years
Catchbasin Manholes	40 Years	5 Years
Catchbasins	40 Years	6 Years
Ditch Inlets	40 Years	7 Years
Lift Stations	50 Years	43 Years
Outfalls	50-80 Years	22 Years
Storm Mains	80 Years	45 Years
Storm Manholes	40 Years	5 Years

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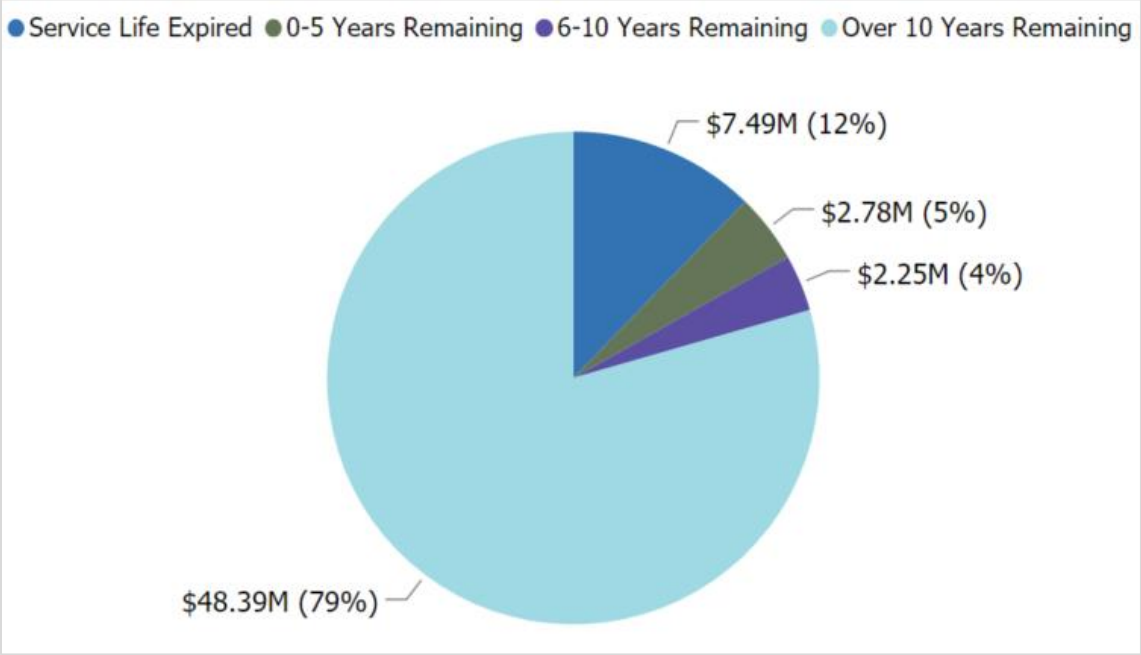
The following pie chart identifies the percentage of assets, by replacement value, that have surpassed their estimated service life and how close all other assets are to approaching their projected replacement date.

Figure 26 Service Life Remaining - Storm Sewer System



6.5.4 Risk & Criticality

Probability of Failure

The following hierarchy identifies the risk parameters used to calculate the probability of failure for all storm sewer mains.

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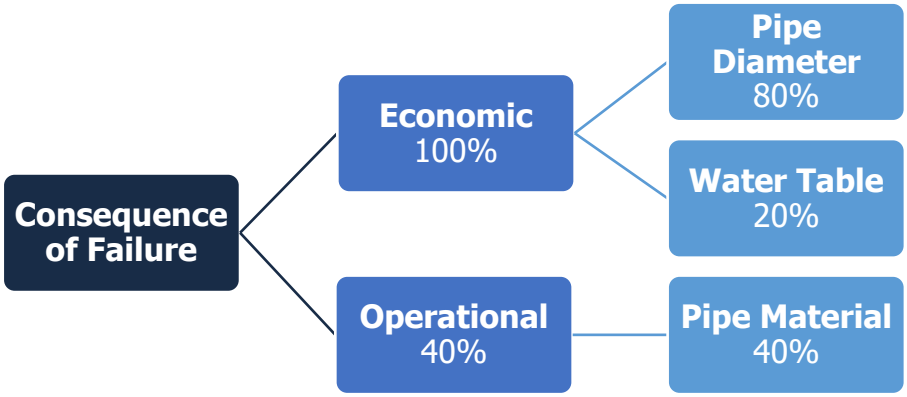
Consequence of Failure

The following hierarchy identifies the risk parameters used to calculate the consequence of failure for storm sewer mains.



Risk Matrix

Using the above risk parameters, the following matrix visualizes the risk rating for each asset by multiplying the consequence and the probability of failure.

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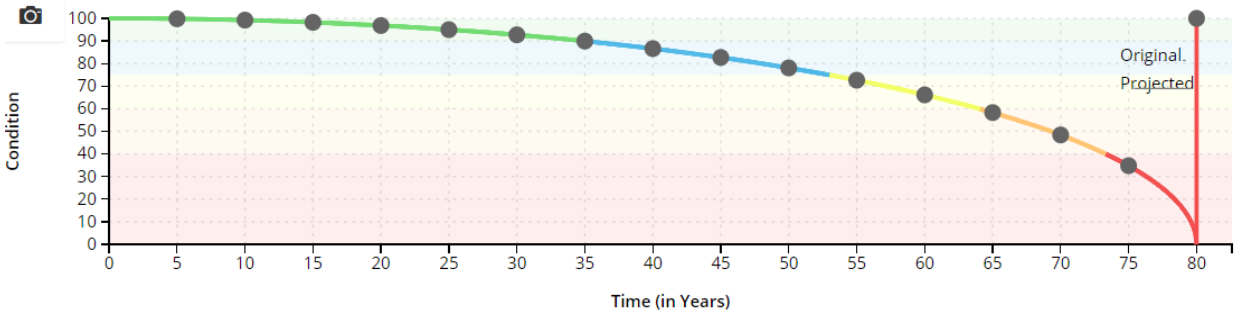
6.5.5 Lifecycle Management

The Town's lifecycle management strategy for the Storm Sewer System includes maintenance, rehabilitation and renewal events. The following lifecycle strategy has been developed for sanitary sewer mains and incorporated into this AMP to help forecast capital requirements over the short-, medium- and long-term:

Table 27 Lifecycle Strategy – Storm Sewer Mains

Event Name	Event Type	Age at Event
Flushing & Cleaning	Maintenance	Every 5 Years
End-of-life Replacement	Replacement	80 Years

Figure 27 Lifecycle Strategy – Storm Sewer Mains



As the Town's understanding of the current cost, risk and performance of their assets evolve, these strategies should be reviewed to determine whether they are achieving the lowest total cost of ownership while still achieving the expected level of service.

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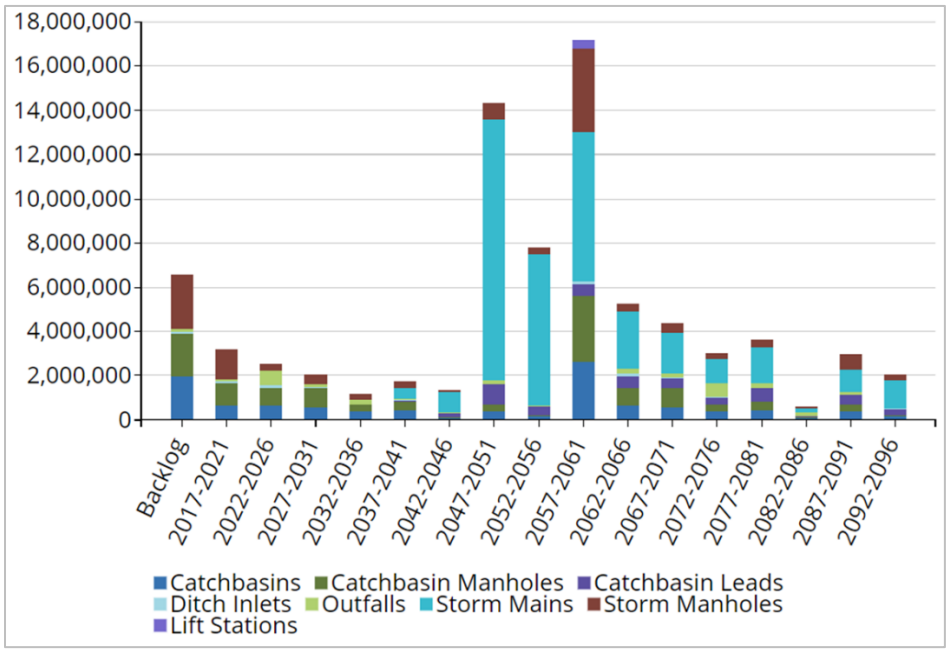
6.5.6 Forecasted Capital Requirements

The following bar chart forecasts the capital requirements for end-of-life replacement of the Town's Storm Sewer System.

Figure 28 Forecasted Capital Requirements - Storm Sewer System



The projected capital expenditures that will need to be undertaken over the next 10 years to maintain the current levels of service can be found in Appendix B.

6.5.7 Recommendations

1. The Town should develop and implement a routine condition assessment schedule for the Storm Sewer System. Storm Mains are considered to be in a good state of repair, meaning assessments may only be beneficial on components that are beginning to approach their end of life or have been identified as problem areas.

2. As the Town's understanding of the probability and consequence of asset failure changes, the risk assessment framework for the Storm Sewer System should be adjusted accordingly. This may include the addition of new data or the re-weighting of existing parameters.

3. Current levels of service should be measured according to the technical and community levels of service metrics established by the Town in **Section 8.1.7** and **8.1.8.**

4. The municipality is underfunding its long-term requirements on an annual basis. See **Section 9.0** for a detailed financial strategy designed to achieve long-term funding requirements.

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6.6 Machinery & Equipment

6.6.1 Asset Inventory & Replacement Cost

The following table provides the quantity and total replacement cost of the Town's Machinery & Equipment inventory.

All replacement costs have been determined through the inflation of each assets historical cost to today's value.

Table 28 Asset Inventory - Machinery & Equipment

Asset Segment	Quantity	Replacement Cost Method	Total Replacement Cost
Airport Equipment	9 unit	CPI Tables & User-Defined Cost	$745,125
Fire Emergency Services Equipment	50 units	CPI Tables & User-Defined Cost	$545,388
Parks and Recreation Equipment	18 units	CPI Tables & User-Defined Cost	$377,620
Public Works Equipment	45 units	CPI Tables	$3,080,653
		Total:	**$4,748,786**

6.6.2 Current Asset Condition

The following table details the source of condition data as well as the average condition rating and the average percentage of service life remaining for each asset type.

Table 29 Current Asset Condition - Machinery & Equipment

Asset Segment	Condition Source	Average Condition	% of Service Life Remaining
Airport Equipment	Age-based	Poor	37%
Fire Emergency Services Equipment	Age-based	Poor	28%
Parks and Recreation Equipment	Age-based	Fair	55%
Public Works Equipment	Age-based	Fair	46%
	Total:	**Poor**	**38%**

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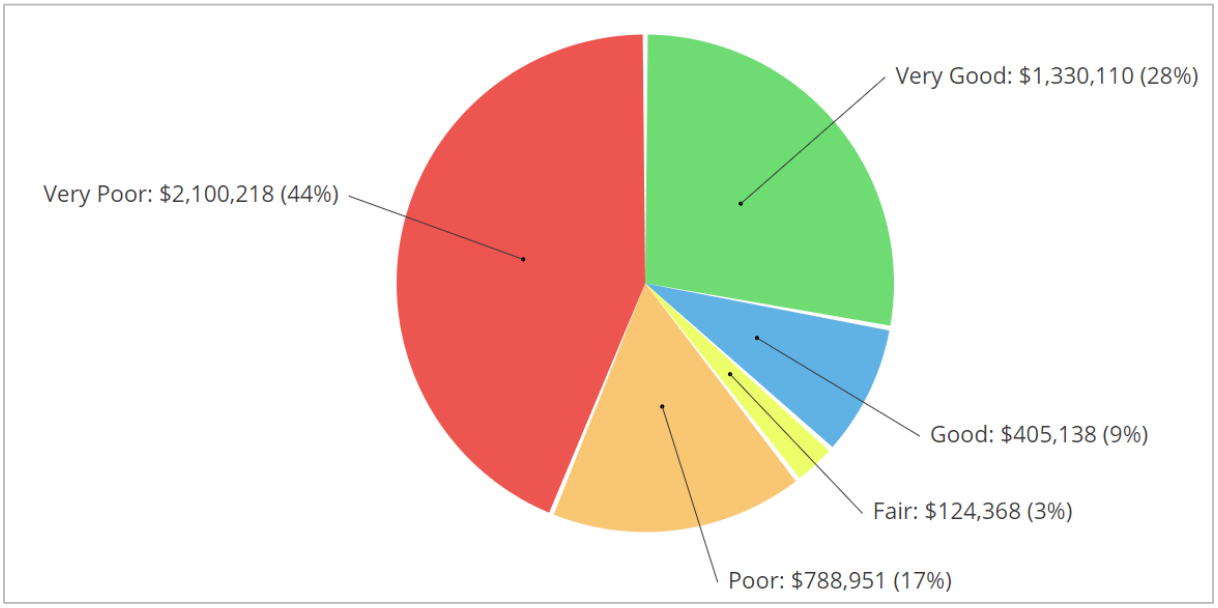
Figure 29 Current Asset Condition - Machinery & Equipment



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

6.6.3 Estimated Useful Life & Average Asset Age

The estimated useful life for Machinery & Equipment has been assigned according to a combination of established industry standards and staff knowledge.

Table 30 Service Life Remaining - Machinery & Equipment

Asset Segment	Estimated Useful Life	Average Service Life Remaining
Airport Equipment	15 Years	2 Years
Fire Emergency Services Equipment	10-25 Years	(3 Years)
Parks and Recreation Equipment	7-15 Years	4 Years
Public Works Equipment	10-15 Years	0 Years

The following pie chart identifies the percentage of assets, by replacement value, that have surpassed their estimated service life and how close all other assets are to approaching their projected replacement date.

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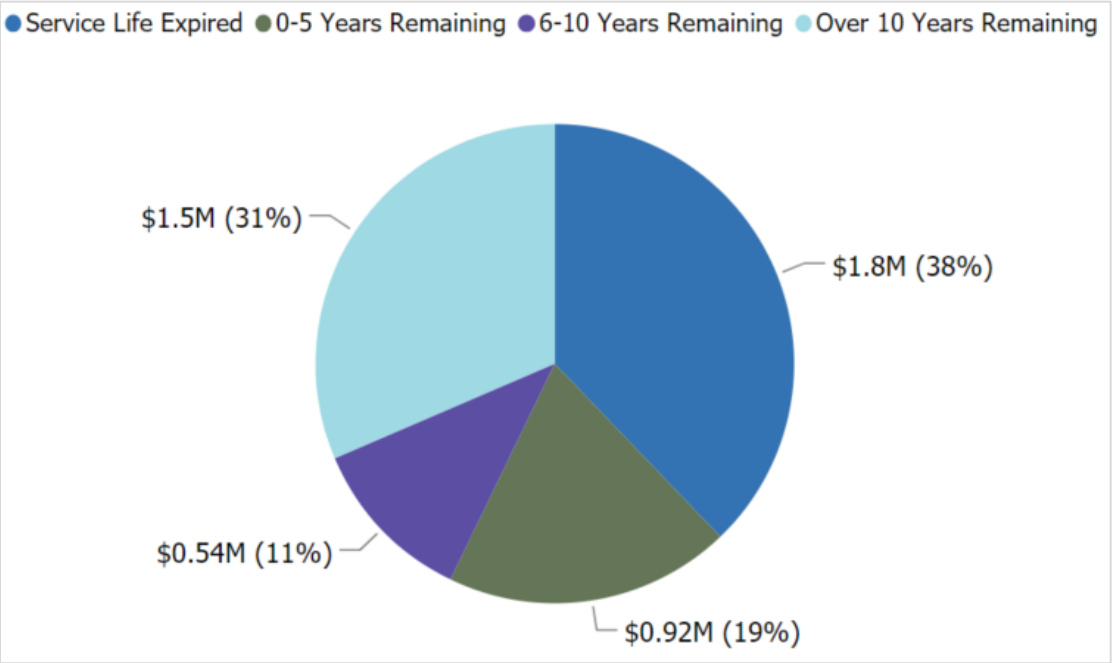
Figure 30 Service Life Remaining - Machinery & Equipment



6.6.4 Risk & Criticality

Probability of Failure

The following hierarchy identifies the risk parameters used to calculate the probability of failure for Buildings.

Consequence of Failure

The following hierarchy identifies the risk parameters used to calculate the consequence of failure for Buildings.

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Risk Matrix

Using the above risk parameters, the following matrix visualizes the risk rating for each asset by multiplying the consequence and the probability of failure.

6.6.5 Lifecycle Management

Machinery & Equipment assets do not typically need a detailed lifecycle strategy including maintenance, rehabilitation and replacement activities. Although regular maintenance is required to ensure the proper operation of all fleet assets, these costs do not factor into the capital costs included in the overall financial strategy. For the purposes of this AMP the lifecycle strategy for these assets will simply include end-of-life replacement.

As the Town's understanding of the current cost, risk and performance of their assets evolve, these strategies should be reviewed to determine whether they are achieving the lowest total cost of ownership while still achieving the expected level of service.

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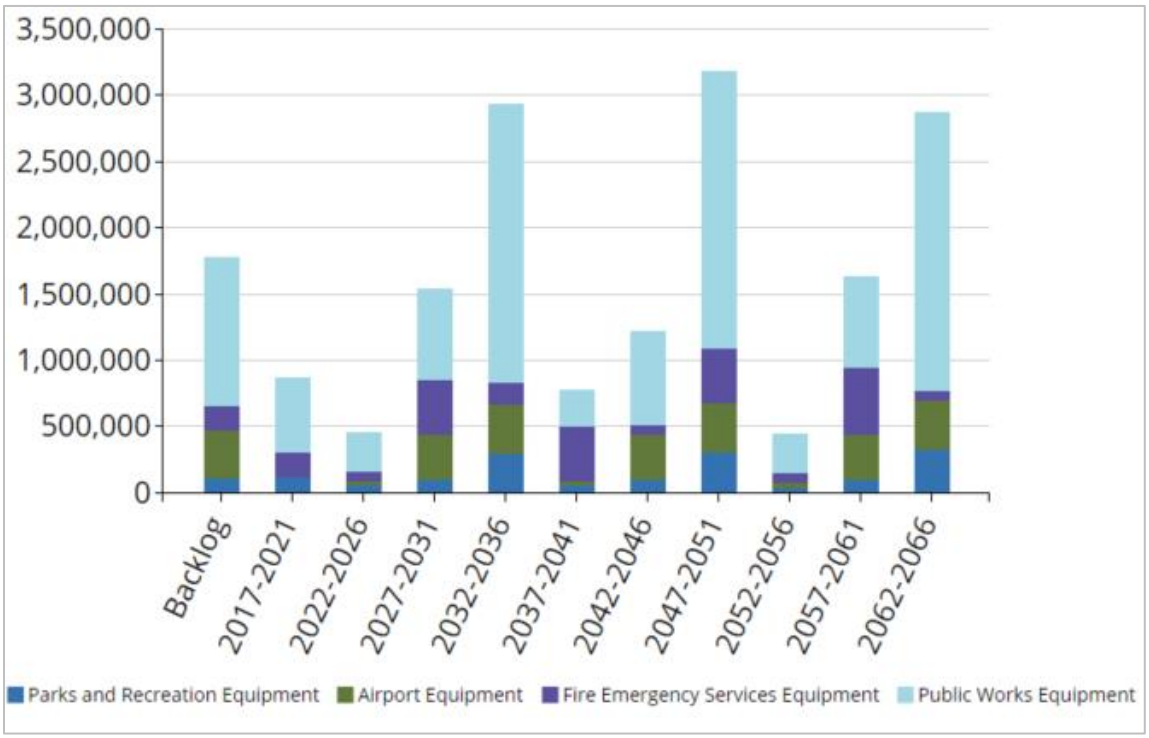
6.6.6 Forecasted Capital Requirements

The following bar chart forecasts the capital requirements for replacement of the Town's Machinery & Equipment.

Figure 31 Forecasted Capital Requirements - Machinery & Equipment



The projected capital expenditures that will need to be undertaken over the next 10 years to maintain the current levels of service can be found in Appendix B.

6.6.7 Recommendations

- The Town should develop and implement a routine condition assessment schedule for Machinery & Equipment. At this time 55% of assets are considered to be in 'Very Poor' or 'Poor" condition. These assets should be assessed by staff to determine whether there are any immediate lifecycle requirements.

- The Town should work to identify the performance metrics and qualitative descriptions that will be used to measure current levels of service for Machinery & Equipment. These metrics and descriptions should be developed prior to the development of the Town's next AMP

- The municipality is underfunding its long-term requirements on an annual basis. See **Section 9.0** for a detailed financial strategy designed to achieve long-term funding requirements.

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6.7 Fleet

6.7.1 Asset Inventory & Replacement Cost

The following table provides the quantity and total replacement cost of the Town's Fleet inventory.

All replacement costs have been determined through the inflation of each assets historical cost to today's value.

Table 31 Asset Inventory - Fleet

Asset Segment	Quantity	Replacement Cost Method	Total Replacement Cost
Airport	2 units	CPI Tables	$344,990
Community Service	9 units	CPI Tables & User-Defined Cost	$423,514
Fire	5 units	CPI Tables	$1,553,098
Parks	11 units	CPI Tables	$366,476
Planning & Development	2 units	CPI Tables	$67,068
Public Works	21 units	CPI Tables	$1,866,903
		Total:	**$4,622,049**

6.7.2 Current Asset Condition

The following table details the source of condition data as well as the average condition rating and the average percentage of service life remaining for each asset type.

Table 32 Current Asset Condition - Fleet

Asset Segment	Condition Source	Average Condition	% of Service Life Remaining
Airport	Age-based	Very Poor	0%
Community Service	Age-based	Fair	42%
Fire	Age-based	Fair	44%
Parks	Age-based	Poor	26%
Planning & Development	Age-based	Very Poor	0%
Public Works	Age-based	Very Poor	13%
	Overall:	**Poor**	**23%**

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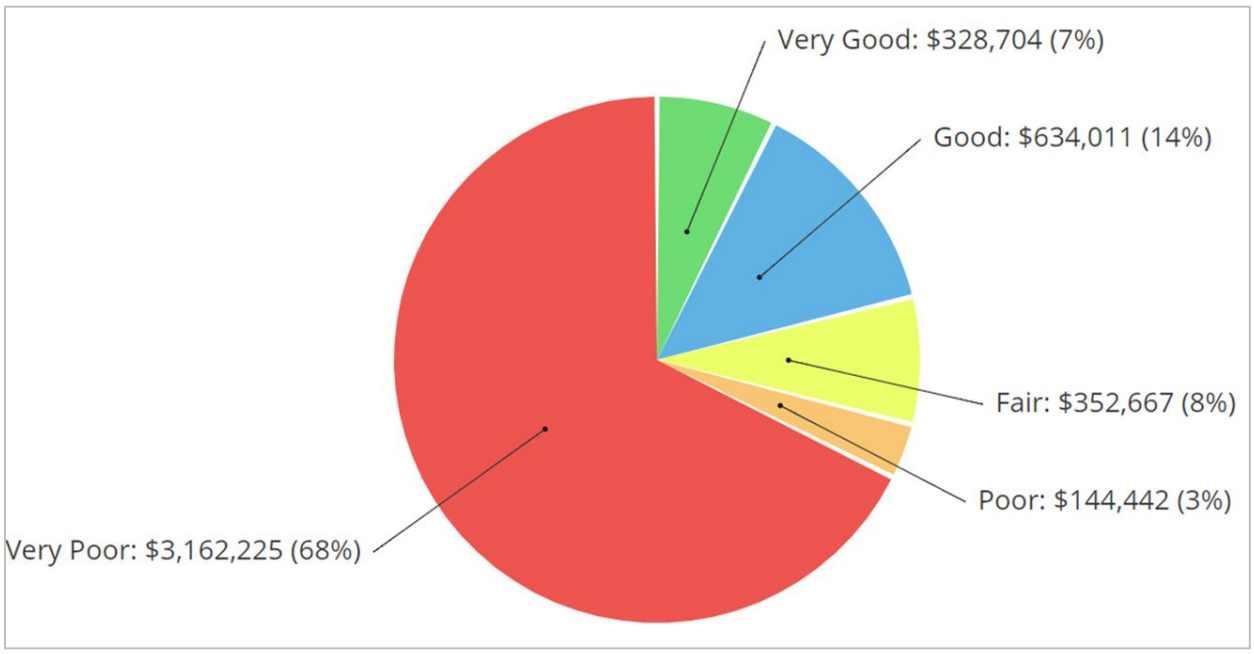
Figure 32 Current Asset Condition - Fleet



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

6.7.3 Estimated Useful Life & Average Asset Age

The estimated useful life for Fleet has been assigned according to a combination of established industry standards and staff knowledge.

Table 33 Service Life Remaining - Fleet

Asset Segment	Estimated Useful Life	Average Service Life Remaining
Airport	12-15 Years	(6 Years)
Community Service	7-12 Years	(1 Year)
Fire	12-25 Years	6 Years
Parks	7 Years	(2 Years)
Planning & Development	7 Years	0 Years
Public Works	7-12 Years	(1 Year)

The following pie chart identifies the percentage of assets, by replacement value, that have surpassed their estimated service life and how close all other assets are to approaching their projected replacement date.

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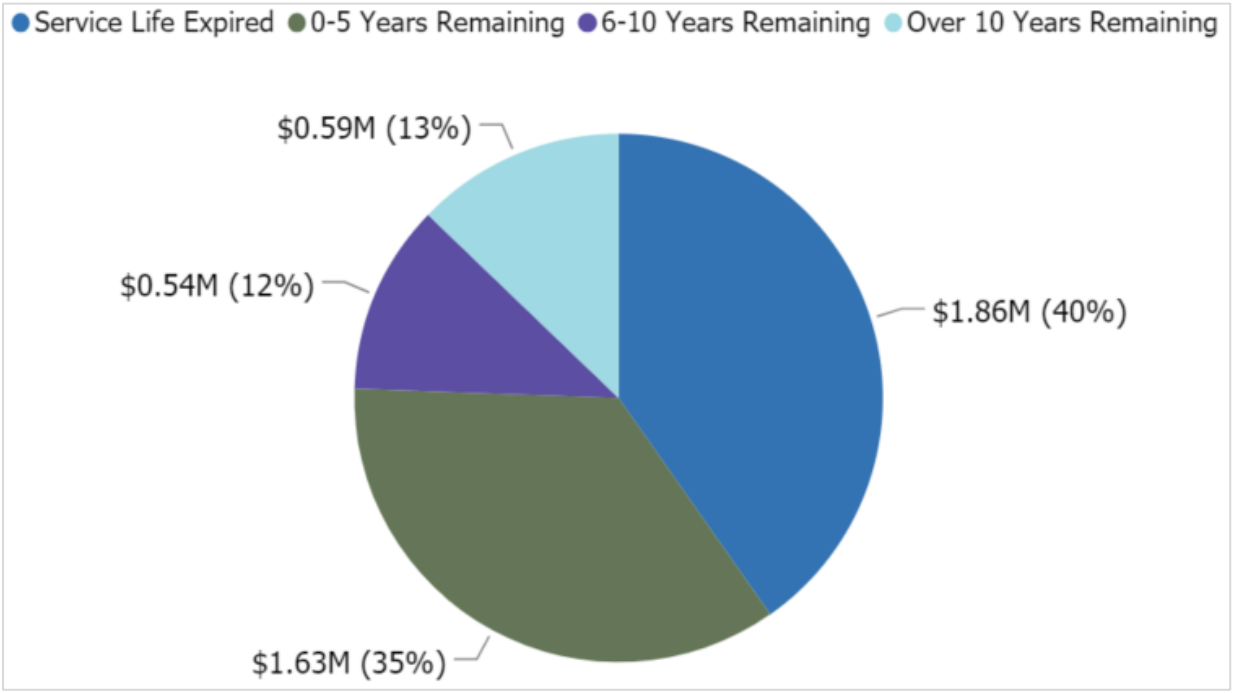
Figure 33 Service Life Remaining – Fleet



6.7.4 Risk & Criticality

Probability of Failure

The following hierarchy identifies the risk parameters used to calculate the probability of failure for Buildings.

Consequence of Failure

The following hierarchy identifies the risk parameters used to calculate the consequence of failure for Buildings.

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Risk Matrix

Using the above risk parameters, the following matrix visualizes the risk rating for each asset by multiplying the consequence and the probability of failure.

6.7.5 Lifecycle Management

Fleet assets do not typically need a detailed lifecycle strategy including maintenance, rehabilitation and replacement activities. Although regular maintenance is required to ensure the proper operation of all fleet assets, these costs do not factor into the capital costs included in the overall financial strategy. For the purposes of this AMP the lifecycle strategy for these assets will simply include end-of-life replacement.

As the Town's understanding of the current cost, risk and performance of their assets evolve, these strategies should be reviewed to determine whether they are achieving the lowest total cost of ownership while still achieving the expected level of service.

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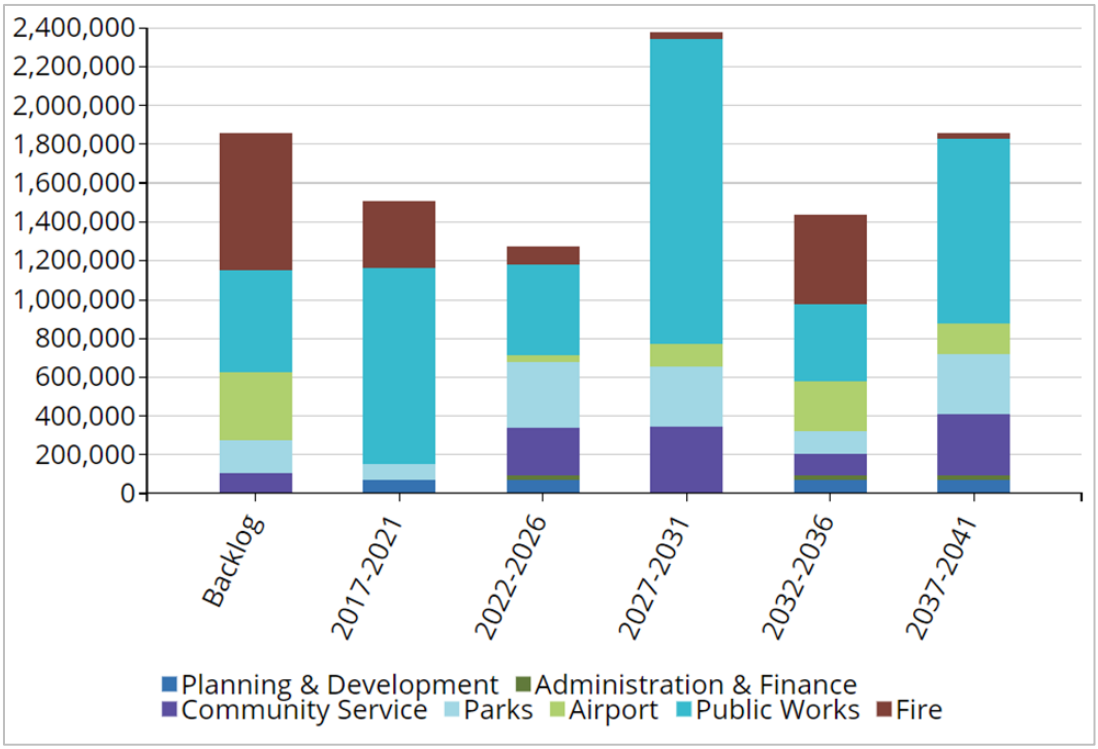
6.7.6 Forecasted Capital Requirements

The following bar chart forecasts the capital requirements for rehabilitation and replacement of the Town's Fleet.

Figure 34 Forecasted Capital Requirements - Fleet



The projected capital expenditures that will need to be undertaken over the next 10 years to maintain the current levels of service can be found in Appendix B.

6.7.7 Recommendations

1. Considering that the relatively poor condition of the Town's Fleet is based on age-based estimated of condition, staff should consider implementing a condition assessment program to provide an updated condition rating that can be used for long-term capital planning.

2. The Town should work to identify the performance metrics and qualitative descriptions that will be used to measure current levels of service for Fleet. These metrics and descriptions should be developed prior to the development of the Town's next AMP.

3. The municipality is underfunding its long-term requirements on an annual basis. See **Section 9.0** for a detailed financial strategy designed to achieve long-term funding requirements.

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6.8 Social Housing

6.8.1 Asset Inventory & Replacement Cost

The following table provides the quantity and total replacement cost of the Town's Social Housing inventory.

All replacement costs have been determined through the inflation of each assets historical cost to today's value.

Table 34 Asset Inventory - Social Housing

Asset Segment	Quantity	Replacement Cost Method	Total Replacement Cost
Non Profit Housing - Victoria	1 unit	CPI Tables	$1,280,320
Non Profit Housing - Christie	1 unit	CPI Tables	$867,902
		Total:	**$2,148,222**

6.8.2 Current Asset Condition

The following table details the source of condition data as well as the average condition rating and the average percentage of service life remaining for each asset type.

Table 35 Current Asset Condition - Social Housing

Asset Segment	Condition Source	Average Condition	% of Service Life Remaining
Non Profit Housing - Victoria	Age-based	Fair	51%
Non Profit Housing - Christie	Age-based	Fair	51%
	Overall:	**Fair**	**51%**

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

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6.8.3 Estimated Useful Life & Average Asset Age

The estimated useful life for Social Housing has been assigned according to a combination of established industry standards and staff knowledge.

Table 36 Service Life Remaining - Social Housing

Asset Segment	Estimated Useful Life	Average Service Life Remaining
Non Profit Housing - Victoria	50 Years	25 Years
Non Profit Housing - Christie	50 Years	25 Years

The following pie chart identifies the percentage of assets, by replacement value, that have surpassed their estimated service life and how close all other assets are to approaching their projected replacement date.

6.8.4 Risk & Criticality

Probability of Failure

The following hierarchy identifies the risk parameters used to calculate the probability of failure for Buildings.

Consequence of Failure

The following hierarchy identifies the risk parameters used to calculate the consequence of failure for Buildings.

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Risk Matrix

Using the above risk parameters, the following matrix visualizes the risk rating for each asset by multiplying the consequence and the probability of failure.

6.8.5 Lifecycle Management

Social Housing assets do not typically need a detailed lifecycle strategy including maintenance, rehabilitation and replacement activities. Although regular maintenance is required to ensure the proper operation of these facilities, these costs do not factor into the capital costs included in the overall financial strategy. For the purposes of this AMP the lifecycle strategy for these assets will simply include end-of-life replacement.

As the Town's understanding of the current cost, risk and performance of their assets evolve, these strategies should be reviewed to determine whether they are achieving the lowest total cost of ownership while still achieving the expected level of service.

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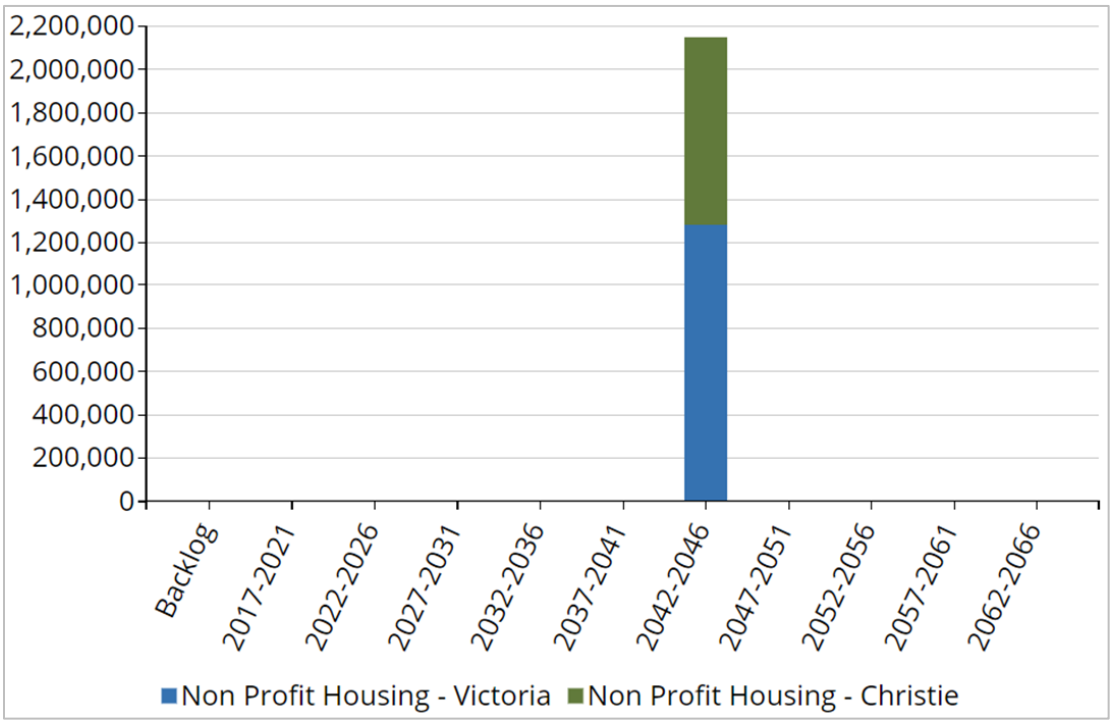
6.8.6 Forecasted Capital Requirements

The following bar chart forecasts the capital requirements for rehabilitation and replacement of the Town's Social Housing.

Figure 35 Forecasted Capital Requirements - Social Housing



The projected capital expenditures that will need to be undertaken over the next 10 years to maintain the current levels of service can be found in Appendix B.

6.8.7 Recommendations

1. Staff should focus on the development of a component-based inventory for all social housing units which includes assessed condition data.

2. The Town should work to identify the performance metrics and qualitative descriptions that will be used to measure current levels of service for Social Housing. These metrics and descriptions should be developed prior to the development of the Town's next AMP

3. The municipality is underfunding its long-term requirements on an annual basis. See **Section 9.0** for a detailed financial strategy designed to achieve long-term funding requirements.

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6.9 Facilities

6.9.1 Asset Inventory Development

The Town is currently working towards developing an accurate and reliable inventory of all municipal facilities including a detailed listing of all components within each facility.

As a result, facilities will not be included in this version of the Town's AMP but will be included in future AMPs.

The following table includes an incomplete listing of the current facilities that the Town owns and is responsible for maintaining. Staff will continue to collect and refine the asset inventory of municipally-owned facilities and update this list accordingly.

Airport	Museum
Children's Complex	Public Works
Civic Centre	Sister Kennedy Centre
East End Hall	Sorting Gap Marina
Fire Hall	Tourist Information Centre
Library	Wastewater Treatment Plant
Memorial Sports Centre	Water Treatment Plant

Although the financial strategy in this AMP does not include the costs associated with the rehabilitation and replacement of these facilities, the Town should be mindful that these assets represent a significant overall portion of the Town's asset portfolio and will require adequate investment to ensure that an acceptable level of service is provided to the community.

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6.10 Parks and Recreation

6.10.1 Asset Inventory Development

Similar to the facilities inventory the Town is currently working towards developing an accurate and reliable inventory of all parks and recreation assets.

As a result, these assets will not be included in this version of the Town's AMP but will be included in future AMPs.

The following table includes a listing of the current parks & recreation areas that the Town owns and is responsible for maintaining:

East Rink	Market Square
Front Street Park	McIrvine Road Park
Legain Park	McIrvine Rink
Lillie Ave Park	North Rink
Lions Park	Phair Park
Marina Playground	Point Park
Marina Private Docks	St. Francis Sports Field
Marina Riverfront	

Although the financial strategy in this AMP does not include the costs associated with the rehabilitation and replacement of these assets, the Town should be mindful that they represent a significant overall portion of the Town's asset portfolio and will require adequate investment to ensure that an acceptable level of service is provided to the community.

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7.0 Asset Management Strategies

After outlining the State of Local Infrastructure, the next step of an AMP is to identify the procedures and practices that will support the Town's organizational objectives, and derive maximum value from its assets. Good asset management requires a focus on continuous program improvement based on industry best practice. This involves strategies for data collection and condition assessment, strategies for the analysis of collected data (lifecycle and risk) and strategies for performance measurement (levels of service).

This section contains information and best practices that will inform the Town's asset management strategies, outline Roadmap activities and their deliverables, and provide strategic recommendations for the continuous improvement of program activities and outputs.

7.1 Non-Infrastructure Solutions & Requirements

The municipality should explore, as requested through the provincial requirements, which non-infrastructure solutions should be incorporated into the budgets for its infrastructure services. Non-infrastructure solutions are such items as studies, policies, condition assessments, consultation exercises, etc., that could potentially extend the life of assets or lower total asset program costs in the future without a direct investment into the infrastructure.

Typical solutions for a municipality include linking the asset management plan to the strategic plan, growth and demand management studies, infrastructure master plans, better integrated infrastructure and land use planning, public consultation on levels of service and condition assessment programs. As part of future asset management plans, a review of these requirements should take place, and resources should be dedicated to these items.

It is recommended, under this category of solutions, that the municipality develop and implement holistic condition assessment programs for all Asset Categories. This will advance the understanding of infrastructure needs, improve budget prioritization methodologies and provide a clearer path of what is required to achieve sustainable infrastructure programs.

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7.2 State of Maturity Report

7.2.1 Introduction

Improving your asset management practices requires a structured and coordinated approach to the individual components of an asset management program. As a first step, it is important to gauge the current state of practice related to asset management at the municipality. A thorough gap analysis helps to determine where to focus efforts in order to build a strong asset management program. In other words, you need to know where you stand before you can figure out the best way to move forward.

The first phase of PSD's Roadmap involved a comprehensive, organization-wide assessment of asset management programs and practices within the Town. The development of the State of Maturity Report involved two key components: the Asset Management Self-Assessment Test (AMSAT) and a series of stakeholder interviews. The final State of Maturity Report outlined the organization's overall state of maturity, proficiency ratings along the six key components of asset management, and recommendations to improve the Town's asset management program.

7.2.2 Asset Management Self-Assessment Test

The Asset Management Self-Assessment Test, implemented in a survey format, relies on a series of questions across specific categories that have been established through international standards and best practice identified as the requirements of a successful asset management program. The results of the AMSAT are then aggregated to provide a performance rating (Basic, Intermediate, Advanced) across six key components. The following table summarizes the Town's results and compares them to the national average of communities surveyed:

Table 37 AMSAT Results

Asset Management Component	Proficiency Level	National Average
Organizational Cognisance	Advanced	Intermediate
Organizational Capacity	Basic	Intermediate
Infrastructure Data/Information	Basic	Intermediate
Asset Management Strategies	Basic	Basic
Financial Strategies	Basic	Basic
Level of Service	Basic	Basic

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7.2.3 Stakeholder Interviews

As a supplement to the AMSAT, additional information was gathered through a series of in-depth interviews with departmental staff who are either directly involved in or support the delivery of an asset category. The results were used for clarification of the features of the organization's asset management program along with who is responsible for managing and delivering the activities involved in the asset management process.

7.2.4 Highlights from the State of Maturity Report

Workshop Date: March 16th, 2017

Organizational Cognizance

In recent years, AM has become a priority at the Council level, partly due to the development of the first Asset Management Plan in 2013 to meet the provincial requirement, and AM as a program is starting to be prioritized by the senior management level down through the municipality. AM has also been linked to the Town's list of Strategic Planning Initiatives (*Item #16 – The Investigation of Accelerating Infrastructure Renewal Programs*) and is being used to advance the overall infrastructure and financial planning of the Town.

Organizational Capacity

There is significant staff knowledge present for the day to day management of individual infrastructure categories, however, limited knowledge of advanced asset management techniques and practices. Also, the human resource availability and adequacy for the purpose of asset management is currently trending from a basic to an intermediate level.

Asset Management Strategies

In general, across all asset categories, life cycle activity analysis is performed in Fort Frances at the project planning stage and not at the network need analysis stage within the municipality. In other words, there is no consistent framework that determines when a piece of infrastructure should have a rehabilitation intervention applied (e.g., resurfacing a road or re-lining a sewer main) as opposed to full reconstruction.

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Financial Strategies

The financial strategies within Fort Frances are currently developing with initial infrastructure life cycle requirements acquired through the 2013 AMP and current accounting protocols. However, while there has been reasonable analysis of short- and long-term capital and operating/maintenance requirements for capital assets, it is premised on an incomplete understanding of overall asset performance given the absence of field condition records.

Levels of Service

Similar to most municipalities throughout Canada, there are currently no holistic level of service models in place at the municipality for the various capital asset categories.

7.2.5 Advancing the Town's State of Maturity

Municipal asset management is an ever-evolving discipline that requires organizations to adapt to emerging regulations and continue to advance internal capabilities. The five key competencies above are areas that the Town should continue to evaluate on a regular basis to determine what areas are seeing advances and which need additional attention.

7.3 Asset Inventory Data

7.3.1 Introduction

An asset management program is only as strong as the data and information available in an organization's asset inventory. Without detailed and accurate asset data, the ability to analyze and evaluate the Town's state of the infrastructure is limited. Data gathering is a resource-intensive process, requiring sufficient human resources capacity and a significant amount of time to develop and maintain. However, committing resources to data collection will result in exponential benefits to the Town's asset management program. Better data results in greater data confidence and ultimately more reliable asset management and financial strategies.

7.3.2 Assessing Data Maturity

As a starting point, it is critical to understand the current state of your data collection practices. From there it is possible to develop techniques and strategies that ensure that your asset management program is being supported by detailed, consistent and complete data. A detailed data maturity assessment will evaluate and analyze the state of your organization's data collecting practices. This will help to identify what asset component data has been collected and what needs to be collected in order to increase the quality of your data and allow for more accurate and advanced analysis.

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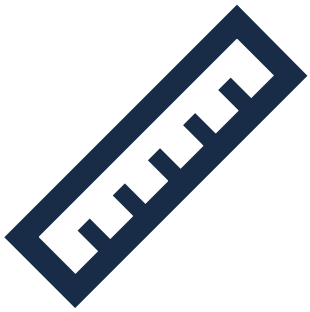
7.3.3 Ongoing Data Collection

Without plans in place for the ongoing collection of asset data and information the ability of an organization to undertake advanced forecasting and analysis will be limited. It is critical that the Town continue to provide resources for the continuing collection of data and the regular updating and maintenance of the Town's asset registry.

7.3.4 Recommendations

- Implement programs and protocols for the continuous collection and maintenance of asset data
- Centralize and consolidate all infrastructure related data (inventory, condition, needs, prioritized requirements, financial data and GIS data) into the CityWide software database, the main asset registry database
- Implement a data governance policy that outlines a consistent corporate approach to database maintenance and management including data handling procedures, roles and responsibilities

7.4 Condition Assessment Programs & Guidelines



7.4.1 Introduction

The foundation of good asset management practice is comprehensive and reliable information on the current condition of your infrastructure. Municipalities need to have a clear understanding of the performance and condition of their assets, and all management decisions regarding future expenditures and field activities should be based on this knowledge.

Asset condition is a measure of the physical state of an asset or the ability of an asset to meet its required utility or level of service. An incomplete or limited understanding about the condition of a given asset can lead to substandard asset management decision-making. While there will be a point where asset rehabilitation or replacement is beneficial, it is important that field intervention activities are conducted at the optimal time to maximize the value of existing assets, and to reduce the threat of service disruption. Accurate and reliable condition data will help to prevent premature and costly rehabilitative or replacement activities, and ensure that lifecycle activities occur at the right time to maximize asset value and useful life.

7.4.2 Establishing Condition Assessment Programs & Guidelines

In practice, integrating condition assessments into your asset management program requires a systematic and coordinated approach to asset data collection. Standardized condition assessment guidelines and data gathering templates will ensure that all collected asset data is comprehensive and comparable. Ultimately, this will lead to increased confidence in the quality of your data and provide a stronger basis for decision-making. Condition assessment guidelines serve as a reference for field employees

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responsible for collecting condition data. This document includes all component and asset level data required, element listing and code guidelines as well as specific instructions for determining asset condition.

Condition assessment can involve different forms of analysis including subjective opinion, mathematical models, or variations thereof, and can be completed through a very detailed or very cursory approach. When establishing the condition of an entire asset category, the cursory approach (metrics such as very good, good, fair, poor, very poor) is used. This will be a less expensive and time-consuming approach when applied to thousands of assets, yet will still provide actionable data. Condition ratings derived from this model use the grading system described in the following table:

Table 38 Canadian Infrastructure Report Card 2016 - Condition Grading System

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

7.4.3 Assessed Condition Data vs. Age-based Data

Measuring asset condition can be a time consuming, labour-intensive and costly practice. However, there is strong evidence that the benefits of implementing condition assessment programs will outweigh any additional costs. In 2015, PSD published a study in partnership with the Association of Municipalities of Ontario (AMO). The report, *The State of Ontario's Roads and Bridges: An Analysis of 93 Municipalities*, enumerated the infrastructure deficits, annual investment gaps, and the physical state of roads, bridges and culverts with a 2013 replacement value of $28 billion.

A critical finding of the report was the dramatic difference in the condition profile of the assets when comparing age-based estimates and actual field inspection observations. For each asset category, field data based condition ratings were significantly higher than age-based condition ratings, with paved roads, culverts, and bridges showing an increase in score (0-100) of +29, +30, and +23 points respectively (**Figure 36**). In other words, age-based measurements may be underestimating the condition of assets by as much as

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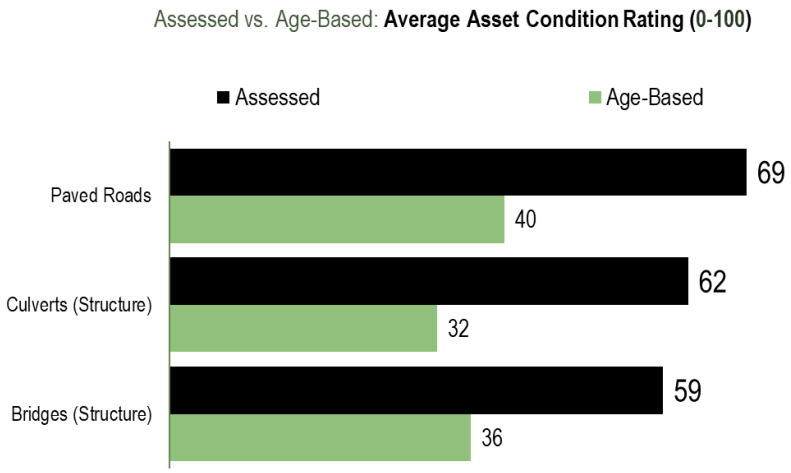
30%. The implication of this finding is that municipalities are making asset management decisions based on inaccurate data, and as a result, are likely making ineffective lifecycle maintenance and replacement decisions.

Figure 36 Assessed vs Age-based Condition Rating



This report represents a strong statistical justification for the use of condition assessments over age-based estimates. Not only will condition-based data provide a more accurate representation of asset condition, it will also provide a stronger basis for making asset management decisions and achieving the lowest total cost of ownership.

7.4.4 PSD's Condition Assessment Programs and Protocols

Workshop Date: March 17th, 2017

On March 17th, 2017 PSD staff held an on-site workshop to guide Town staff in gathering condition data and asset attribute data for all major Asset Categories. The delivery of this workshop included hands-on training displaying how to effectively capture and store condition data as well as guidance for determining asset condition.

The Condition Assessment Documentation Package included internal condition assessment guidelines for the following Asset Categories:

1. **Facilities**
2. **Parks & Natural Areas**
3. **Road Network**
4. **Right-of-Way Appurtenances**
5. **Sidewalks**
6. **Watermains**

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7. **Curb & Gutter**

The Town was also provided with Request for Proposal (RFP) specifications if condition assessments were preferred to be conducted by external consultant. These specifications were included for the following Asset Categories:

1. **Facilities**
2. **Parks & Natural Areas**
3. **CCTV Sanitary Sewers**
4. **Road Network**
5. **Right-of-way Appurtenances**
6. **Zoom Storm Sewers**

After this workshop, the Town was given the task of collecting as much relevant and useful asset data as possible within the Roadmap project scope. The collection of additional data allows for more advanced evaluation and analysis of lifecycle and financial requirements. Throughout the Roadmap, PSD worked alongside the Town to ensure that data was collected as per their recommendations, and uploaded into the asset inventory in the proper format.

7.4.5 Recommendations

- Work towards gathering assessed condition on the Town's entire network of infrastructure assets and implementing routine condition assessment program for all Asset Categories that were not completed during the Roadmap
- All future asset condition assessments should be synchronised with CityWide records in order for captured overall condition ratings to be stored within the CityWide database
- The use of zoom camera should be explored as an alternative inspection process for the wastewater and storm sewer mains

7.5 Risk Management and Project Prioritization

7.5.1 Introduction

For an organization that manages a vast and diverse inventory of capital assets deciding which capital projects to fund can be an intimidating task. There is rarely enough money available to complete all required infrastructure projects. Generally, infrastructure needs exceed municipal financial resources and capacity. This resource scarcity means projects and investments must be prioritized according to their relative importance and risk of failure in order to ensure vital services and critical infrastructure continue to be provided to the community.

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Traditionally, municipalities have prioritized capital projects according to a "worst-first" approach, in which the assets in the worst condition are the highest priority for rehabilitation or replacement. However, this approach fails to account for the fact that some assets are more important to the delivery of vital services and the provision of critical infrastructure than others. As a result, many assets that should be prioritized to prevent service disruption, are left to deteriorate

7.5.2 Risk Management

A municipality's assets are often the leading edge of its exposure to external risk. As such, it is important that policies, processes and procedures are put in place in order to manage and mitigate organizational risk exposure. Minimizing risk exposure, and using a risk-based analysis to drive asset management decision-making and capital project prioritization helps to prevent consequential asset failure and major service disruption. A robust risk management framework allows you to determine the probability and consequence of failure at both the asset category and individual asset level, and use that data to optimize capital funding decisions.

7.5.3 Economic, Social and Environmental Risks

The creation of a robust risk management framework requires the development of risk profiles that take into account three different types of risk: economic, social and environmental. This is often referred to as the "triple bottom line" of assets. These three types of risk can be defined as follows:

Table 39 Triple Bottom Line of Asset Risk

	Economic	The monetary consequences of asset failure for the organization and its customers
	Social	The consequences of asset failure on the social dimensions of the community
	Environmental	The consequence of asset failure on an asset's surrounding environment

7.5.4 Calculating Asset Risk

Integrating a risk management framework into your asset management program requires the translation of risk potential into a quantifiable format. This will allow you to compare and analyze individual assets across your entire asset portfolio. From an asset

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management perspective, risk is a function of the probability of failure and, the consequence of failure.

$$Risk = Probability\ of\ Failure(PoF) \times Consequence\ of\ Failure(CoF)$$

The following table defines both the probability of failure and consequence of failure and the data that could be used to calculate them.

Table 40 Risk Equation Explanation

	Probability of Failure	Consequence of Failure
Definition	The probability of failure directly correlates to the condition of the asset.	The consequence of failure relates to the economic, social and environmental impact of failure.
Data/Parameters	• Asset condition • % of asset life consumed • Known operational issues • Other parameters contributing to asset deterioration (e.g. traffic counts, soil types)	• **Economic**: Cost of rehabilitation or replacement • **Social**: Number of people or critical service affected • **Environmental**: Impact of failure on surrounding environment

The strength of a risk management framework depends on the reliability and availability of asset attribute data. The integration of meaningful asset attribute data that represents the economic, social and environmental risks will provide increased confidence in capital project decision-making and support evidence-based budget deliberations. While more data does not necessarily mean better outcomes, the careful selection of risk parameters that take into account the triple bottom line of assets, can optimize asset management decision-making.

7.5.5 Risk Report Summary

Workshop Date: August 28th, 2017

On August 28th, 2017 PSD delivered a workshop on developing a risk management framework in the Town of Fort Frances. PSD worked alongside staff at the Town to develop risk parameters that allow for the calculation of both the consequence and probability of asset failure. The following table summarizes which asset types had customized risk profiles developed and uploaded into the CityWide database.

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Table 41 Overview of Risk Models Developed by Asset Category

Asset Category	Asset Type	Risk Parameters
Road Network	Road Surface	Condition Road Surface Material MMS Class Design Sub-Class
Sanitary Sewer Network	Sanitary Mains	Condition Pipe Diameter Water Table Proximity to Waterbody Pipe Material
Storm Sewer System	Storm Sewer Mains	Condition Pipe Diameter Water Table Pipe Material
Water System	Water Mains	Condition Pipe Type Water Table Pipe Material Proximity to Waterbody Pipe Diameter

7.5.6 Project Prioritization

One of the benefits of implementing a risk management framework is that it allows you to prioritize capital projects based on the greatest risk of failure. This is not always the asset that is in the worst condition. The implementation of the developed risk management framework enables the municipality to create reports that rank assets according to the highest risk and consequence of failure.

7.5.7 Asset Category Risk Matrices

Once both the probability of failure and the consequence of failure has been calculated for each asset the results can be aggregated to obtain a high-level view of asset risk at an organizational level and for each major asset category. Risk matrices provide a valuable overview of asset risk and serve as an important medium to communicate where, and to what extent, risk is present within your asset portfolio.

The following matrices provide a visual representation of the level of risk in each asset category. Individual assets are grouped based on both their **Consequence of Failure (1-5)** and **Probability of Failure (1-5)**. The assets located closer to the bottom-left of the matrix (green boxes) are less likely to fail and have lesser consequences for the municipality if they do fail. The assets located closer to the top-right of the matrix (red

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boxes) are at the greatest risk of failure and will have far greater consequences for the municipality if they do.

7.5.8 Recommendations

- Complete risk model development and assessment for minor Asset Categories including fleet, IT, Land Improvements etc.
- Integrate climate change risk assessment into risk management framework (exposure, vulnerability, resilience, adaptation)

7.6 Lifecycle Activity Framework

7.6.1 Introduction

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. This 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. In order to ensure that municipal assets are performing as expected and meeting the needs of your customers, it is important to establish a strategy to proactively manage the deterioration of your assets.

7.6.2 Lifecycle Activity Management

Lifecycle activity management is the practice of managing the deterioration of your assets through the implementation of a maintenance, rehabilitation and replacement strategy. An asset lifecycle strategy will ensure that you are doing the right thing to the right asset at the right time. Effective lifecycle activity management can extend the service life of assets and ensure that assets continue to meet service and performance requirements at the lowest total cost of ownership.

Figure 37 provides an example of the benefits of lifecycle activity management over the service life of an asset.

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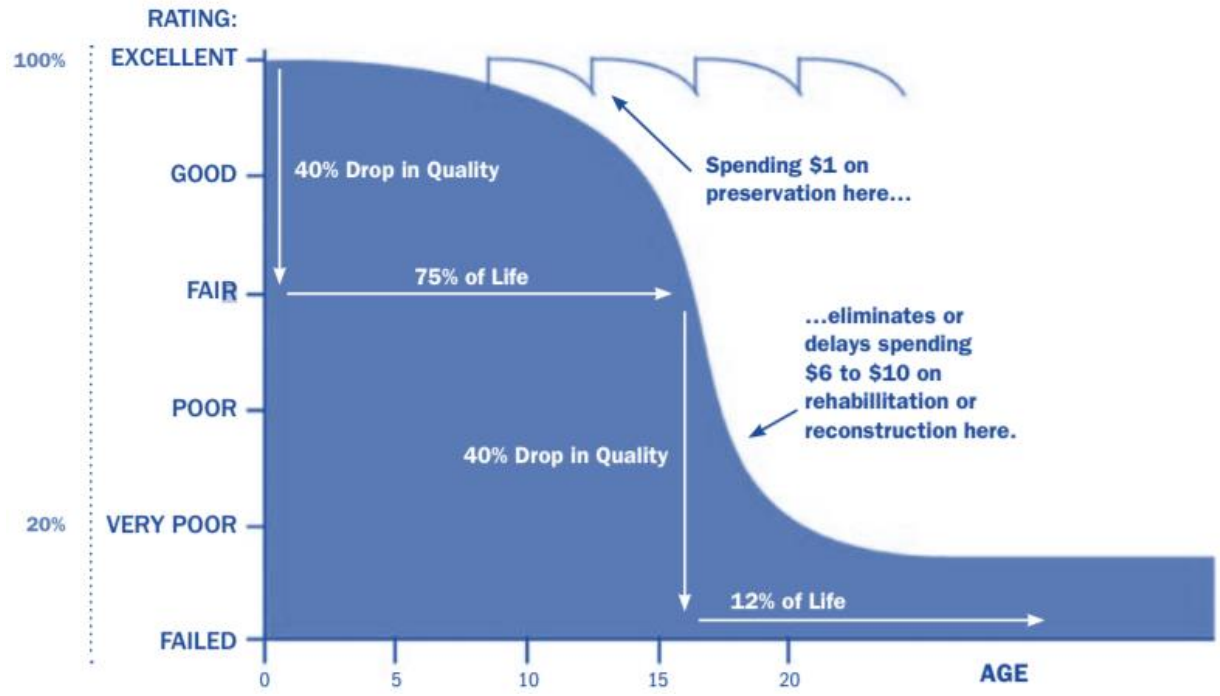
Figure 37 Deterioration Curve Outlining Benefits of Lifecycle Activities (Canadian Infrastructure Report Card 2016)



7.6.3 Developing a Lifecycle Activity Strategy

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

Table 42 Cost of Lifecycle Activity Types

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

Depending on initial lifecycle management strategies, asset performance can be sustained through a combination of preventative maintenance and rehabilitation, but at

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some point reconstruction or replacement is required. Understanding what effect these activities will have on the lifecycle of an asset, and their cost, will enable you to make better decisions about caring for your assets.

7.6.4 Lifecycle Strategy and Asset Profile Development

Workshop Date: August 29th, 2017

On August 29th, 2017, PSD consultants and Town of Fort Frances staff collaborated to develop customized lifecycle strategies that optimize maintenance, rehabilitation and replacement activities for major infrastructure assets. At this time the Town has developed lifecycle strategies for both road surfaces and sanitary mains that have been used in this AMP to more accurately identify long-term capital requirements.

7.6.5 Recommendations

- Continue to develop and refine lifecycle strategies for core Asset Categories including roads, bridges, water, sewer, and storm
- Integrate lifecycle strategies based on any upcoming studies or reports (e.g. Road Needs Study, OSIM inspections)
- Update asset-specific deterioration curves as more reliable and accurate data becomes available

7.7 Climate Change

7.7.1 Introduction

The impacts of climate change present a momentous challenge to municipal infrastructure. As temperatures and sea levels rise, and extreme weather events occur with greater frequency, it is critical that municipalities attempt to understand the emerging threat of climate change and develop strategies to ensure that vital services and critical infrastructure continue to operate as expected. This will require consideration of four key factors of climate change (exposure, vulnerability, resilience and adaptation) at every stage of an asset's lifecycle.

7.7.2 Threat of Climate Change

Globally, there has been a significant increase in weather-related loss events resulting in property damage and/or bodily injury (**Figure 38**). Municipal infrastructure is at particular risk to meteorological, hydrological and climatological events leading to an increasing rate of asset deterioration, failure and service disruption.

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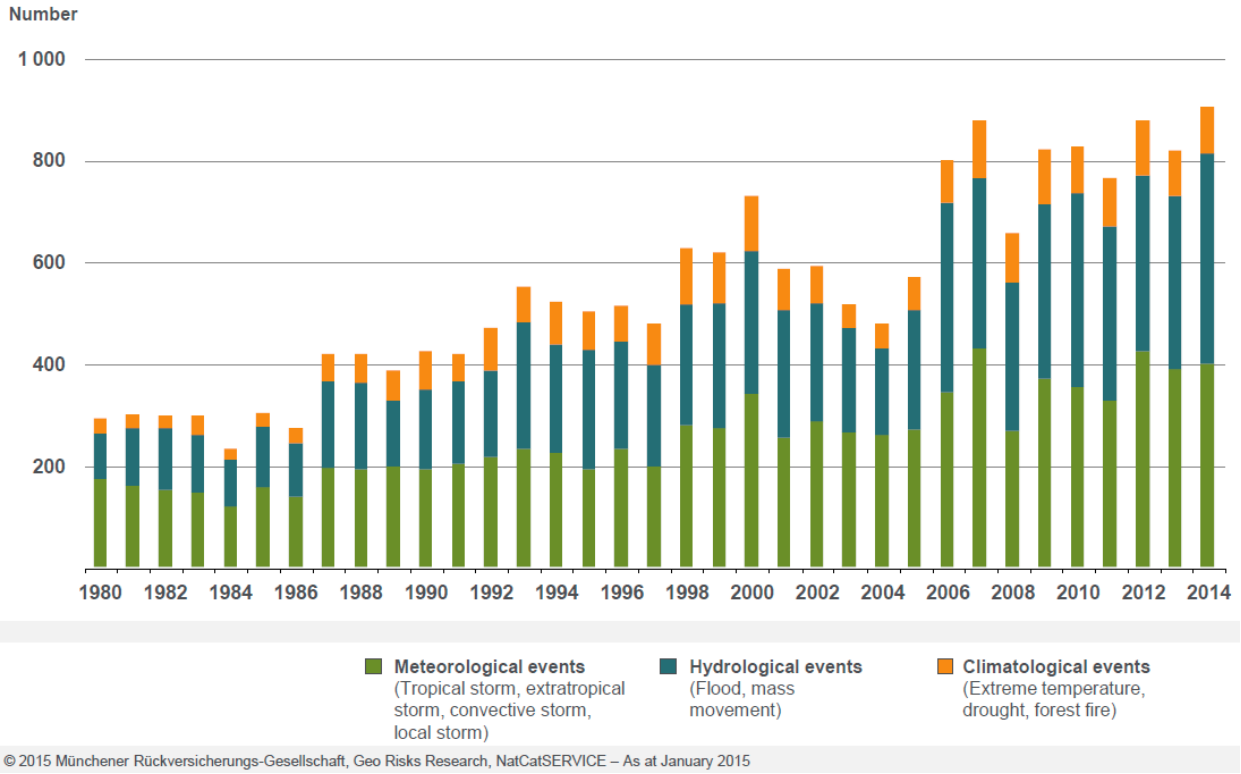
Figure 38 Weather related loss events worldwide 1980-2014



According to *Canada's Sixth National Report on Climate Change 2014* the type of climate threats that are most likely to impact the Town's infrastructure include:

Higher Average Annual Temperature

- Between 1948 and 2012, the annual average air surface temperature over Canada's landmass has increased by about 1.7ºC, approximately twice the global average.
- Average summer temperatures to rise by 2-4ºC with more warming in the winter
- Increase in instances of heatwaves
- Increase in average rainfall

Increase in Total Annual Precipitation

- There will be significant changes in precipitation between seasons, with winters becoming wetter and summer becoming drier
- Increased rate of ice and windstorms

Increase in Frequency of Extreme Weather Events

- It is expected that the frequency and severity of extreme weather events will change
- In some geographical areas, extreme weather events will occur with greater frequency and severity than others

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7.7.3 Exposure & Vulnerability

Climate change exposure is the nature and degree to which a system is exposed to significant climate variations. Exposure is a combination of the probable range of a climate stressor and the physical characteristics of a geographical location. For example, for a coastal facility, its height above sea level correlates to the exposure of the asset to rising sea levels caused by the onset of climate change. Understanding the exposure of existing infrastructure, and integrating climate change exposure into the planning and design process of asset management is a critical step towards minimizing the impacts the expected threats of climate change.

The Intergovernmental Panel on Climate Change (IPCC) defines vulnerability as "the degree to which a system is susceptible, and unable to cope with, adverse effects of climate change, including climate variability and extremes". Vulnerability considers the structural strength, integrity and function of assets or asset systems in terms of the potential for damage or functional disruption as a result of climate stressors.

7.7.4 Resilience & Adaptation

Resilience is used to refer to the capacity of a system to absorb disturbance without losing essential function. In the context of physical assets or asset systems, it is the ability of a system to continue to operate as a result of a built-in redundancy. For example, a Road Network's ability to operate despite the loss of a single road or bridge, or the relative ease with which it can be replaced. The context for resilience is a combination of physical constraints on repair or replacement, socio-economic limitations and system redundancy.

The IPCC defines adaptation as "the adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities". Adaptive strategies fall into three categories: protect, accommodate and retreat. In a coastal region, a protection strategy might aim to protect assets from flooding by constructing hard or soft structures by installing sea walls, beach nourishment or wetland restoration. Accommodation may call for preparing for periodic flooding by having operational plans inplace. Retreat involves no attempt to protect the asset. Under these conditions a facility or structure may be abandoned completely. Although applied specifically to coastal examples, these adaptive strategies may be generalised to all types of asset and asset geographical locations.

7.7.5 Expected Impact of Climate Change on Infrastructure

The International Institute for Sustainable Development identified the following impacts of climate change on municipal infrastructure in Canada:

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Table 43 Impacts of Climate Change on Infrastructure (International Institute for Sustainable Development)

	Greater frequency of freeze-thaw cycles leading to thermal cracking, rutting, frost heave and thaw weakening
	Soil instability, ground movement and slope instability
	Triggered instability of embankments and pavement structures
	Shortened life expectancy of highways, roads and rail
	Drier conditions affecting the lifecycle of bridges and culverts
	Reduced structural integrity of building components through mechanical, chemical and biological degradation
	Increased corrosion and mold growth
	Damaged or flooded structures
	Reduced service life and functionality of components and systems
	Increased repair, maintenance, reserve fund contingencies and energy costs
	Increased water demand and pressure on infrastructure
	Loss of potable water
	Increased risk of flooding; storm sewer infrastructure more frequently exceeded
	Rupture of drinking water lines, sewage lines and sewage storage tanks
	Saltwater intrusion in groundwater aquifers

7.7.6 Recommendations

- Consider the impact of climate change on the estimated useful life of all assets
- Adjust lifecycle activity strategies for assets that are particularly exposed or vulnerable to the impacts of climate change
- Develop policies that outline a commitment to consider the impact of climate change on existing infrastructure and future development
- Include climate change considerations into the design and planning phase of asset lifecycle
- Integrate impacts of climate change into risk management frameworks
- Develop disaster mitigation plans in the event of infrastructure failure

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8.0 Levels of Service Framework

8.1.1 Introduction

The primary responsibility of a municipality is to ensure that they are providing adequate and sustainable services to their community. This outcome is generally supported by organizational objectives, mission statements and official plans that outline the rationale for these activities.

To ensure that organizational objectives align with expected service outcomes, it is necessary to develop a process for the systematic measurement, monitoring and evaluation of an organization's level of service. A level of service can be defined as a description of the service output for an activity or service area against which performance may be measured. To put it simply, a level of service is a measure of what a municipality is providing to its community.

8.1.2 Performance Measurement

Performance measurement is a key component of an effective level of service strategy. It allows you to analyze how well you are meeting the needs and expectations of your stakeholders, and identify where there are gaps that need to be addressed. Developing realistic levels of service using meaningful key performance indicators (KPIs) is instrumental in managing citizen expectations, identifying areas requiring higher investments, driving organizational performance and securing the highest value for money from public assets.

To facilitate this process, it is useful to develop a framework for tracking and evaluating the levels of service being provided. This will require the translation of organizational objectives and expected service outcomes into key performance indicators that reflect evolving demand on infrastructure, the organization's fiscal capacity and overall organizational objectives. A centralized database that outlines levels of service along with the KPIs that will allow you to assess whether a level of service is being met will assist with this process. The Town should then collect data on its current performance for the chosen KPIs and establish targets that reflect the current fiscal capacity of the municipality, its corporate and strategic goals, and changes in demographics that may place additional demand on service areas.

8.1.3 Guiding Principles and Core Values

As a guide to developing and measuring levels of service, it is useful to understand what the public values in the provision of municipal services. **Table 44** provides an overview of the values that the municipality should strive to accommodate when delivering services

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to the public. These are based on the values that the public generally expects to be delivered when a service is being provided to them.

Table 44 Core Values Guiding Levels of Service

Value	Description
Accessible	Services are available and accessible for customers who require them.
Reliable	Services are provided with minimal service disruption and are available to customers in line with needs and expectations.
Safe	Services are delivered such that they minimize health, safety and security risks.
Regulatory	Services meet regulatory requirements of all levels of government.
Affordable	Services are suitable for the intended function (fit for purpose).
Sustainable	Services are designed to be used efficiently and long-term plans are in place to ensure that they are available to all customers into the future.

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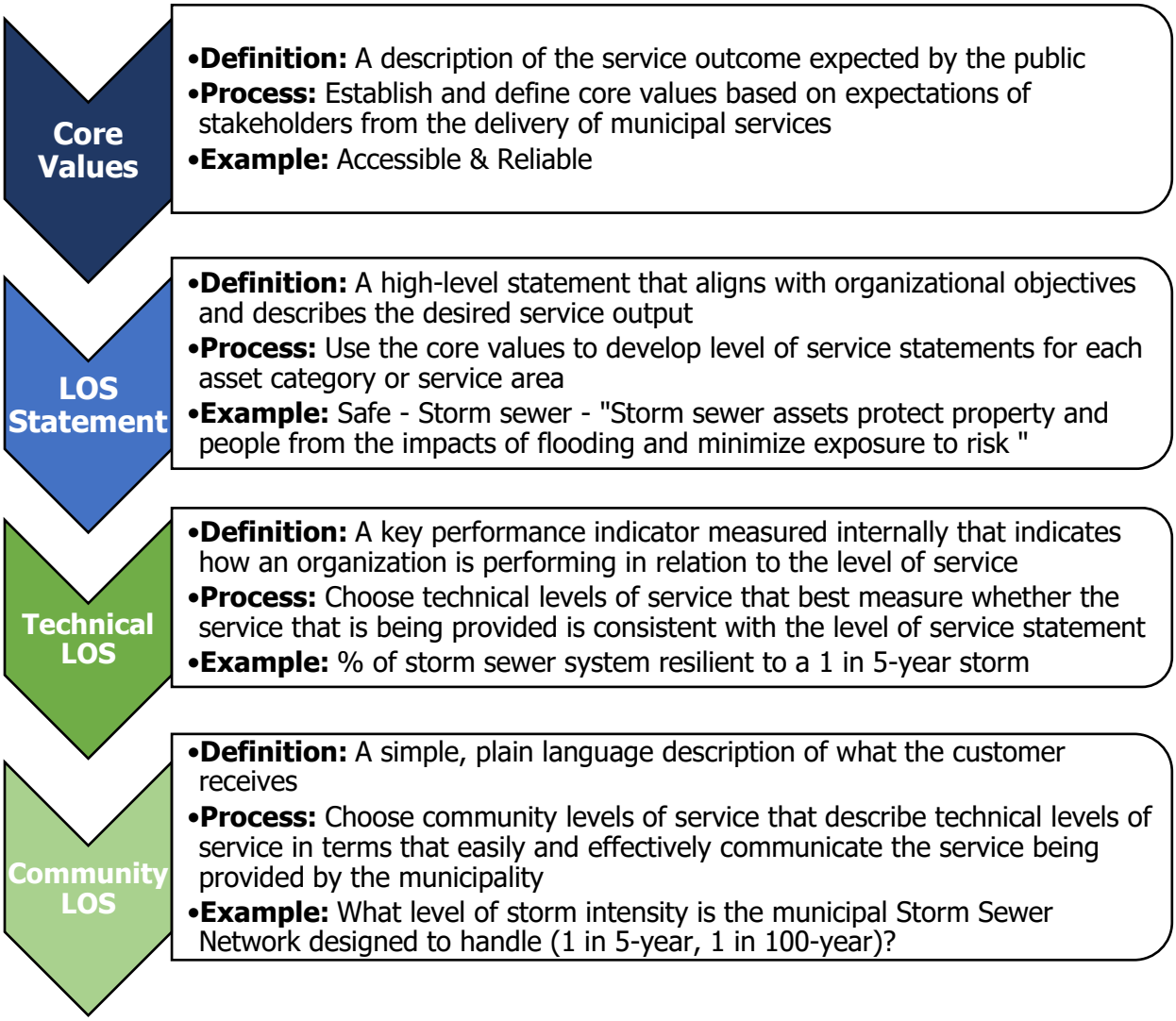
8.1.4 Defining and Establishing Levels of Service

Figure 39 provides a basic guide to establishing levels of service.

Figure 39 Guide to Establishing Levels of Service



8.1.5 Selecting Technical Levels of Service

Deciding which KPIs to use when establishing technical levels of service is not a science, but there are a few key considerations to take into account. A good rule to follow in determining the best indicators is to use **SMART** system developed by the Institute of Public Works Engineering Australasia:

KPIs should cover a **Specific** aspect of service, be **Measurable**, and have a clear plan for achieving targets (**Achievable**). They should also be **Relevant** to the level of service and strategic objective, and have a clear timeframe for when targets will be achieved (**Timebound**).

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8.1.6 Levels of Service Workshop

Workshop Date: August 22nd, 2018

On August 22nd, 2018 PSD met with Town staff to develop a customized levels of service framework. The initial presentation and discussion covered the importance of levels of service in an asset management program and the role that it should play in decision-making moving forward. From there the workshop focused on developing meaningful level of service statements, technical and customer levels of service (included in the State of Local Infrastructure) that take into consideration the availability of data and the ability of these indicators to provide actionable data.

The Workshop concluded with an interview of Town staff on the various internal and external factors and trends that may affect their ability to provide expected levels of service in the future. The results of this interview are summarized in the following section.

8.1.7 Technical Levels of Service

The following tables outline the performance measures that the Town has selected to measure the current technical level of service provided to the community. This has been developed in preparation for the requirements outlined in O.Reg. 588/17. At this time, staff are working towards measuring and collecting the data required to fill in this framework. This work will be completed prior to the development of the Town's next AMP by July 1, 2021.

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Table 45 Technical Levels of Service - Water System

Asset Category	Core Value	Performance Measure	Current Level of Service
Water System	Accessible & Reliable	% of properties connected to the municipal water system	TBD
		% of properties where fire flow is available	TBD
		# of connection-days per year due to water main breaks compared to the total number of properties connected to the municipal water system	TBD
	Safe & Regulatory	# of connection-days per year where a boil water advisory notice is in place compared to the total number of properties connected to the municipal water system	TBD
		# of water quality customer complaints	TBD
	Affordable	(Annual residential water bill / average household income) * 100	1.52%
		O&M Cost (includes treatment and distribution)/ pipe km length	TBD
	Sustainable	% of the water system that is in good or very good condition	29%
		% of the water system that is in poor or very poor condition	64%
		DWQMS reviewed annually	Yes

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Table 46 Technical Levels of Service - Sanitary Sewer Network

Asset Category	Core Value	Performance Measure	Current Level of Service
Sanitary Sewer Network	Accessible & Reliable	% of properties connected to the municipal wastewater system	TBD
		% of sanitary sewers flushed annually	TBD
		# of sanitary sewer main backups	TBD
	Safe & Regulatory	# 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	TBD
		# of connection-days per year due to wastewater backups compared to the total number of properties connected to the municipal wastewater system	TBD
		# of effluent violations per year due to wastewater discharge compared to the total number of properties connected to the municipal wastewater system	TBD
	Affordable	(Average annual residential sewer bill / average household income) * 100	1.52%
		O&M Cost (includes treatment and collection) / km pipe length	TBD
	Sustainable	% of the sanitary sewer network that is in good or very good condition	24%
		% of the sanitary sewer network that is in poor or very poor condition	46%

Table 47 Technical Levels of Service - Storm Sewer System

Asset Category	Core Value	Performance Measure	Current Level of Service
Storm Sewer System	Accessible & Reliable	# of customer complaints of surface flooding due to storm events	TBD
		% of storm sewer mains inspected	TBD
		% of catch basins cleaned	TBD
	Safe & Regulatory	% of properties in municipality resilient to a 100-year storm	TBD
		% of the municipal stormwater management system resilient to a 5-year storm	TBD
	Affordable	O&M Cost / km of stormsewer and urban ditches	TBD
	Sustainable	% of the stormwater system that is in good or very good condition	67%
		% of the stormwater system that is in poor or very poor condition	26%

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Table 48 Technical Levels of Service Road Network

Asset Category	Core Value	Performance Measure	Current Level of Service
Road Network	Accessible & Reliable	Lane-km of arterial roads (MMS classes 1 and 2) per land area (km/km^2)	TBD
		Lane-km of collector roads (MMS classes 3 and 4) per land area (km/km^2)	TBD
		Lane-km of local roads (MMS classes 5 and 6) per land area (km/km^2)	TBD
	Safe & Regulatory	# of customer complaints related to the road network	TBD
		# of customer complaints related to the sidewalk network	TBD
	Affordable	O&M costs for paved roads / lane-km (excluding winter control)	TBD
		O&M costs for unpaved roads / lane-km (excluding winter control)	TBD
		Winter control costs / lane-km	TBD
	Sustainable	% of the road network that is in good or very good condition	25%
		% of the road network that is in poor or very poor condition	19%
		Average pavement condition index for paved roads in the municipality	60% - Good
		Average surface condition for unpaved roads in the municipality (e.g. excellent, good, fair, poor)	46% - Fair

Table 49 Technical Levels of Service - Bridges

Asset Category	Core Value	Performance Measure	Current Level of Service
Bridges	Accessible & Reliable	% of bridges in the municipality with loading or dimensional restrictions	0%
		# of unplanned bridge closures	0%
	Safe & Regulatory	% of bridges inspected every two years	100%
	Affordable	O&M costs for bridges / household	TBD
	Sustainable	Average bridge condition index value for bridges in the municipality	64%

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8.1.8 Community Levels of Service

The following tables outline the qualitative descriptions that the Town has selected to measure the current community level of service provided to the community. This has been developed in preparation for the requirements outlined in O.Reg. 588/17. At this time, staff are working towards measuring and collecting the data required to fill in this framework. This work will be completed prior to the development of the Town's next AMP by July 1, 2021.

Table 50 Community Levels of Service - Water System

Asset Category	Core Value	Qualitative Description	Current Level of Service
Water System	Accessible & Reliable	Description, which may include maps, of the user groups or areas of the municipality that are connected to the municipal water system	TBD
		Description, which may include maps, of the user groups or areas of the municipality that have fire flow	TBD
		Description of boil water advisories and service interruptions	TBD
	Safe & Regulatory	Description of customer satisfaction with water quality	TBD
	Affordable	What is the bi-monthly residential water bill?	$478.08
	Sustainable	When was the last time that the Town's DWQMS was reviewed?	July 2018

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Table 51 Community Levels of Service - Sanitary Sewer Network

Asset Category	Core Value	Qualitative Description	Current Level of Service
Sanitary Sewer Network	Accessible & Reliable	Description, which may include maps, of the user groups or areas of the municipality that are connected to the municipal wastewater system	TBD
	Safe & Regulatory	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	TBD
		Description of the frequency and volume of overflows in combined sewers in the municipal wastewater system that occur in habitable areas or beaches	TBD
		Description of how stormwater can get into sanitary sewers in the municipal wastewater system, causing sewage to overflow into streets or backup into homes	TBD
		Description of how sanitary sewers in the municipal wastewater system are designed to be resilient to stormwater infiltration	TBD
		Description of the effluent that is discharged from sewage treatment plants in the municipal wastewater system	TBD
	Affordable	What is the amount of the bi-monthly residential sewer bill?	$478.08
	Sustainable	When was the last time that the AMP was reviewed?	TBD

Table 52 Community Levels of Service Storm Sewer System

Asset Category	Core Value	Qualitative Description	Current Level of Service
Storm Sewer System	Accessible & Reliable	Description, which may include map, of the user groups or areas of the municipality that are protected from flooding, including the extent of protection provided by the municipal stormwater management system	TBD
	Safe & Regulatory	What level of storm intensity is the municipal stormwater network designed to handle (e.g. 1 in 5-year)?	TBD
	Affordable	What is the O&M cost to maintain the stormwater network per household?	TBD
	Sustainable	When was the last time that the AMP was reviewed?	TBD

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Table 53 Community Levels of Service - Storm Sewer System

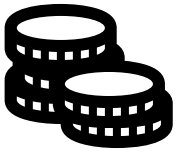
Asset Category	Core Value	Qualitative Description	Current Level of Service
Road Network	Accessible & Reliable	Description, which may include maps, of the road network in the municipality and its level of connectivity	TBD
	Safe & Regulatory	Description of minimum maintenance standards for road network (road surfaces and sidewalks)	TBD
	Affordable	What is the O&M cost to maintain the road network per household?	TBD
	Sustainable	Description or images that illustrate the different levels of road class pavement condition	TBD

Table 54 Community Levels of Service - Bridges

Asset Category	Core Value	Qualitative Description	Current Level of Service
Bridges	Accessible & Reliable	Description of the traffic that is supported by municipal bridges (e.g. heavy transport vehicles, motor vehicles, emergency vehicles, pedestrians, cyclists)	TBD
	Safe & Regulatory	Description of the OSIM inspection process	TBD
	Affordable	What is the O&M cost to maintain bridges per household?	TBD
	Sustainable	When was the last time the AMP was reviewed?	TBD

8.2 Trends Impacting Levels of Service

The provision of desired levels of service is not simply a matter of proper asset management. There are a wide range of internal and external factors that may impact the ability of a municipality to provide reliable public services. As part of the Levels of Service Workshop, PSD interviewed Town staff to gain greater insight into the challenges and opportunities facing the municipality now and into the future. The following sections summarize the results of this interview:



Fiscal Capacity

Maintaining municipal infrastructure and providing desired levels of service requires the allocation of adequate financial resources. Fiscal capacity and budget constraints are a constant concern for staff across all departments attempting to manage the maintenance and rehabilitation of municipal infrastructure. While there is a keen understanding of the benefits of a

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proactive approach to managing the lifecycle of infrastructure assets, there is often not enough funding to engage in more proactive maintenance, rehabilitation and replacement activities leading most municipalities to take a reactive approach to managing their assets.

Managing the infrastructure deficit and aligning the current reinvestment rates to the target reinvestment rates is a key concern, not only for the Town of Fort Frances, but for all municipalities. Moreover, with the advent of social media, residents have become more scrutinizing of their Town's infrastructure in comparison to neighbouring towns and have developed high and often unattainable expectations. With a lack of adequate funding available to complete all required capital and operating activities, it is critical that Town staff develop and support a network-wide risk assessment framework to prioritize infrastructure projects and ensure that limited funds are dispersed effectively to achieve the greatest benefit to the community and manage their growing expectations.

Municipalities typically have few means at their disposal to raise adequate and sustainable funding to meet operational and capital requirements. As a result, they are heavily dependent on both provincial and federal grant programs to maintain and replace municipal infrastructure. Any fluctuations in annual grant funding secured can have a dramatic impact on provided services.

Staff have noted that their reliance on grant funding, especially for underfunded assets such as roads, storm sewers, and bridges is a major vulnerability; the Town will be applying for OCIF top-up funding for their roads as they are in a worse condition then their underground infrastructure. They also noted that due to delayed responses with the FCM grant applications, they were unable to complete projects such as the zoom-camera program in time. Nevertheless, staff attempt to apply for as many available grant funding programs as possible, and in the absence of reliable grant funding programs, the Town will have to explore how existing revenue sources can be leveraged to ensure that existing municipal infrastructure is adequately maintained.

Aging Infrastructure

The condition and performance of municipal infrastructure assets directly correlates to the quality of services a municipality can deliver to its residents. Aging and deteriorating assets increasingly remain in service past their estimated service lives due to a lack of fiscal capacity to replace or rehabilitate as needed. Staff expressed particular concern about the current state of underground infrastructure with water and wastewater assets being in poor condition. Due to age and deterioration, there is concern that a significant portion of this infrastructure will need to be replaced soon and that planning will be required to ensure that adequate funding is allocated to address these needs. Typically, Council is less inclined to see these types of projects as particularly attractive which may further contribute to their continued underfunding. In addition to underground infrastructure, there is also concern about the current condition of buildings and community facilities

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since these assets are dealt with on a primarily reactive measure. Additional capital investment may be required in order to meet both the existing desires of citizens and as a tool to attract population growth and economic activity.

Climate Change and Weather Events

Forecasting for infrastructure needs based on climate change remains an imprecise science. However, broader environmental and weather patterns have a clear and direct impact on the reliability of critical infrastructure services. As such, it is important that the impacts of weather events on municipal infrastructure are accounted for in the development of asset management strategies. In recent years, the town of Fort Frances has experienced a higher rate of extreme rainfall causing damage to core infrastructure. These events have in turn placed more pressure on the operational mitigation and maintenance of assets; thereby allocating less funding and resources for capital projects. In the future, collecting climate change and weather data will allow the Town to set up mitigation plans and allocate the proper funding to fortify their systems from often unpredictable environmental events thereby shifting from a reactive to a proactive approach.

Demographic Change and Expected Growth

Municipal demographics can also serve as an infrastructure demand driver, and as a result, can change how a municipality decides to allocate its resources. Population growth is also a significant demand driver for existing assets and may require the municipality to construct new infrastructure to parallel community expectations. The Town has experienced a decline in population forecasts, and therefore, has yet to implement any growth strategies to deal with capacity issues or infrastructure usage. However, Staff had indicated that the Town has a majority aging community which will affect the types of services the Town and Council prioritize such as snow removal/winter management and accessibility of sidewalks and roads. Over time, growth projections should be accounted for in short-, medium- and long-term capital projections to better identify the costs associated with population growth.

Community Expectations

The general public will often have their own opinions about how a public service should be delivered. Municipal staff are tasked with balancing requests from the public with the reality of available funding to provide the best service possible at the lowest total cost. This can be a difficult task as there is often a significant gap between expectations and reality. Town staff remarked that there has been a noticeable increase in service expectations in recent years, in line with the advent of social media. This has been particularly noteworthy for snow removal, parks and recreation programming and facilities. Managing these expectations can be a tricky task, but it can also be made easier through the development

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of a level of service framework and the use of community and technical levels of service to better communicate the scope and resources required to provide adequate services to the community. Overall, no noticeable changes have been recognized across the different services that the Town offers, except for a decrease in water usage with the loss of a major industrial customer.

Organizational Change and Capacity

Managing municipal assets and delivering public services requires adequate organizational capacity. The availability of staff to facilitate these projects is a concern for many municipalities. Succession planning has become one of the key challenges that an aging municipal workforce faces as senior staff progress towards possible retirement. The loss of knowledge and experience that accompanies staff departures can have a dramatic impact on the ability of an organization to continue operations and provide services to the level that's previously been expected.

In recent years the Town has experienced a high rate of turnover at both the senior and middle management level, with most management positions seeing turnover in the past five years. This issue is not confined to management as many of the Town's operators are also new and are not yet subject matter experts with a keen grasp on the condition of the assets. As managers and operational staff leave the organization it is critical that the knowledge and experience of these employees is preserved and/or transferred to existing staff who can take on these roles and ensure that levels of service are managed consistently and effectively. This is extremely critical considering the recent changes to the Minimum Maintenance Standards (MMS) that will affect how operators maintain some of the assets and services that the Town offers. Fortunately, staff remarked that there are succession planning strategies in place and that the Town's middle management team is full of young, capable individuals.

8.3 Recommendations

- Begin to measure current levels of service as part of a comprehensive performance measurement framework
- Once current levels of service have been measured, establish target levels of service
- Evaluate levels of service on an annual basis and adjust targets in collaboration with Council in an effort to balance community expectations, cost, risk and performance
- Communicate provided levels of service with the public and engage in public consultation to identify emerging perceptions and priorities

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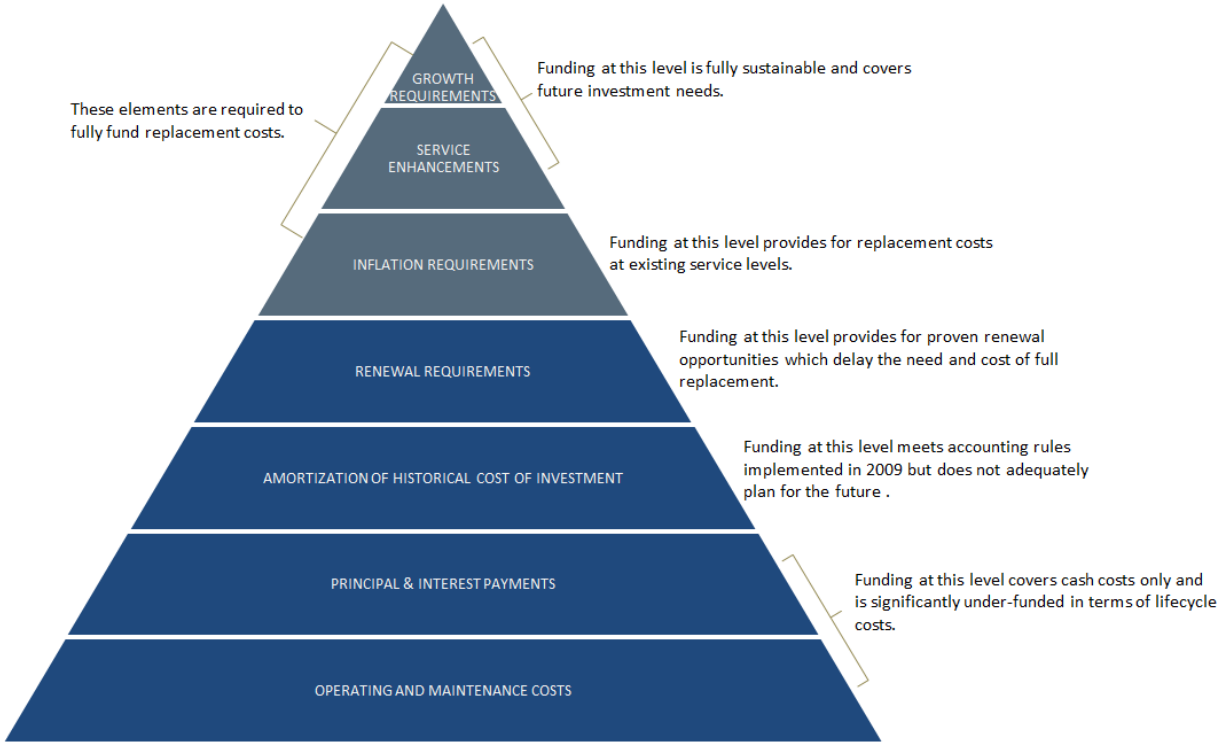
9.0 Financial Strategy

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

9.1 Financial Strategy Overview

The following pyramid depicts the various cost elements and resulting funding levels that should be incorporated into a financial strategy based on best practices.



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)

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2. Use of traditional sources of municipal funds:
    a. Tax levies
    b. User fees
    c. Reserves
    d. Debt

3. Use of non-traditional sources of municipal funds:
    a. Reallocated budgets
    b. Partnerships
    c. Procurement methods

4. Use of Senior Government Funds:
    a. Gas tax
    b. Annual grants

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

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

1. 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.

This financial strategy includes recommendations that avoid long-term funding deficits.

9.2 Funding Objective

We have developed two scenarios that would enable Fort Frances to achieve full funding within 5 to 20 years for the following assets:

1. **Tax Funded Assets**: Road Network, Bridges, Storm Sewer System, Machinery & Equipment, Social Housing and Fleet

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2. **Rate Funded Assets**: Sanitary Sewer Network, Water System

Note: For the purposes of this AMP, we have excluded the category of gravel roads since gravel roads are a perpetual maintenance asset and end of life replacement calculations do not normally apply. If gravel roads are maintained properly, they, in essence, could last forever.

The two scenarios are as follows:

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

2. **Lifecycle Activities Scenario:** Based on the assumption that lifecycle activities are performed at the optimal time to extend the estimated useful life of assets at the lowest cost; assets are replaced at the end of the extended estimated useful life.

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

9.3 Financial Profile: Tax Funded Assets

9.3.1 Current Funding Position – End of Life Scenario

Table 55 and **Table 56** outline, by asset category, Fort Frances' average annual asset investment requirements, current funding positions, and funding increases required to achieve full funding on assets funded by taxes.

Table 55 Summary of Infrastructure Requirements & Current Funding Available

Asset Category	Average Annual Investment Required	2018 Annual Funding Available					Annual Deficit/Surplus
		Taxes	Gas Tax	OCIF	Taxes to Reserves	Total Funding Available	
Road Network	3,550,000	517,000	573,000	422,000	0	1,512,000	2,038,000
Storm Sewer System	998,000	145,000	0	0	0	145,000	853,000
Bridges	190,000	28,000	0	0	0	28,000	162,000
Social Housing	43,000	6,000	0	0	0	6,000	37,000
Machinery & Equipment	333,000	123,000	0	0	0	123,000	210,000
Fleet	385,000	131,000	0	0	0	131,000	254,000
Total:	**5,499,000**	**950,000**	**573,000**	**422,000**	**0**	**1,945,000**	**3,554,000**

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Under the end of life scenario, the average annual investment requirement for the above categories is $5,499,000. Annual revenue currently allocated to these assets for capital purposes is $1,945,000 leaving an annual deficit of $3,554,000. To put it another way, under an end of life scenario, these infrastructure classes are currently funded at 35% of their long-term requirements.

9.3.2 Full Funding Requirements – End of Life Scenario

In 2018, Fort Frances had annual tax revenues of $10,403,000. As illustrated in **Table 56**, without consideration of any other sources of revenue or cost containment strategies, full funding would require the following tax change over time:

Table 56 Tax Change Required for Full Funding – End of Life Scenario

Asset Category	Tax Change Required for Full Funding
Road Network	19.6%
Storm Sewer System	8.2%
Bridges	1.6%
Social Housing	0.4%
Machinery & Equipment	2.0%
Fleet	2.4%
Total:	**34.2%**

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

Fort Frances's formula based OCIF grant is scheduled to grow from $422,000 in 2018 to $683,000 in 2020.

As illustrated in **Table 74**, Fort Frances's debt payments for these asset categories will be decreasing by $84,000 over the next 5 years and by $84,000 over the next 10 years. Although not shown in the table, debt payment decreases will be $84,000 and $84,000 over the next 15 and 20 years respectively.

Our analysis of this scenario includes capturing the above changes and allocating them to the infrastructure deficit outlined above.

Table 57 outlines this concept and presents a number of options:

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Table 57 Effect of Changes in OCIF Funding and Reallocating Decreases in Debt Costs

	Without Capturing Changes				With Capturing Changes			
	5 Years	10 Years	15 Years	20 Years	5 Years	10 Years	15 Years	20 Years
Infrastructure Deficit	3,554,000	3,554,000	3,554,000	3,554,000	3,554,000	3,554,000	3,554,000	3,554,000
Change in Debt Costs	N/A	N/A	N/A	N/A	-84,000	-84,000	-84,000	-84,000
Change in OCIF Grants	N/A	N/A	N/A	N/A	-260,000	-260,000	-260,000	-260,000
Resulting Infrastructure Deficit:	**3,554,000**	**3,554,000**	**3,554,000**	**3,554,000**	**3,210,000**	**3,210,000**	**3,210,000**	**3,210,000**
Resulting Tax Increase Required	34.2%	34.2%	34.2%	34.2%	30.9%	30.9%	30.9%	30.9%
Annually:	6.8%	3.4%	2.3%	1.7%	6.2%	3.1%	2.1%	1.5%

9.3.3 Current Funding Position – Lifecycle Activities Scenario

As described in this report, investing in a lifecycle activity strategy (as opposed to an end of life replacement strategy) would enable Fort Frances to lower its average annual capital requirements by $284,000. The table below summarizes the difference:

Table 58 Annual Capital Requirements Comparison - End of Life vs Lifecycle Activities

	Annual Capital Requirements		
	End of Life	Lifecycle Activities	Change
Road Network	3,550,000	3,266,000	284,000
Storm Sewer System	998,000	998,000	0
Bridges	190,000	190,000	0
Social Housing	43,000	43,000	0
Machinery & Equipment	333,000	333,000	0
Fleet	385,000	385,000	0
Total:	**5,499,000**	**5,215,000**	**284,000**
Note:			
Change is net of annual cost of lifecycle activities			

Table 59 and **Table 60** restate, by asset category, Fort Frances's average annual asset investment requirements, current funding positions, and funding increases required to

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achieve full funding on assets funded by taxes under the lifecycle activities scenario. The bottom line difference to the information presented in the end of life scenario is that annual requirements and the annual deficit both decrease by $284,000. Current funding remains unchanged.

Table 59 Summary of Infrastructure Requirements & Current Funding Available - Lifecycle Activities Scenario

Asset Category	Average Annual Investment Required	2018 Annual Funding Available					Annual Deficit/Surplus
		Taxes	Gas Tax	OCIF	Taxes to Reserves	Total Funding Available	
Road Network	3,266,000	517,000	573,000	422,000	0	1,512,000	1,754,000
Storm Sewer System	998,000	145,000	0	0	0	145,000	853,000
Bridges	190,000	28,000	0	0	0	28,000	162,000
Social Housing	43,000	6,000	0	0	0	6,000	37,000
Machinery & Equipment	333,000	123,000	0	0	0	123,000	210,000
Fleet	385,000	131,000	0	0	0	131,000	254,000
Total:	**5,215,000**	**950,000**	**573,000**	**422,000**	**0**	**1,945,000**	**3,270,000**

Under the lifecycle activities scenario, the average annual investment requirement for the above categories is $5,215,000. Annual revenue currently allocated to these assets for capital purposes is $2,945,000 leaving an annual deficit of $3,270,000. To put it another way, under a lifecycle activities scenario, these infrastructure classes are currently funded at 37% of their long-term requirements.

In 2018, Fort Frances had annual tax revenues of $10,403,000. As illustrated in **Table 60**, without consideration of any other sources of revenue or cost containment strategies, full funding would require the following tax change over time:

Table 60 Tax Change Required for Full Funding - Lifecycle Activities Scenario

Asset Category	Tax Change Required for Full Funding
Road Network	16.9%
Storm Sewer System	8.2%
Bridges	1.6%
Social Housing	0.4%
Machinery & Equipment	2.0%
Fleet	2.4%
Total:	31.5%

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

a) Fort Frances's formula based OCIF grant is scheduled to grow from $422,000 in 2018 to $683,000 in 2020.

b) As illustrated in **Table 74**, Fort Frances's debt payments for these asset categories will be decreasing by $84,000 over the next 5 years and by $84,000 over the next 10 years. Although not shown in the table, debt payment decreases will be $84,000 and $84,000 over the next 15 and 20 years respectively.

Our analysis of this scenario includes capturing the above changes and allocating them to the infrastructure deficit outlined above. **Table 61** outlines this concept and presents a number of options.

Table 61 Effect of Changes in OCIF Funding and Reallocating Decreases in Debt Costs - Lifecycle Activities Scenario

	Without Capturing Changes				With Capturing Changes			
	5 Years	10 Years	15 Years	20 Years	5 Years	10 Years	15 Years	20 Years
Infrastructure Deficit	3,270,000	3,270,000	3,270,000	3,270,000	3,270,000	3,270,000	3,270,000	3,270,000
Change in Debt Costs	N/A	N/A	N/A	N/A	-84,000	-84,000	-84,000	-84,000
Change in OCIF Grants	N/A	N/A	N/A	N/A	-260,000	-260,000	-260,000	-260,000
Resulting Infrastructure Deficit:	**3,270,000**	**3,270,000**	**3,270,000**	**3,270,000**	**2,926,000**	**2,926,000**	**2,926,000**	**2,926,000**
Resulting Tax Increase Required	34.2%	34.2%	34.2%	34.2%	30.9%	30.9%	30.9%	30.9%
Annually:	6.8%	3.4%	2.3%	1.7%	6.2%	3.1%	2.1%	1.5%

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9.3.4 Financial Strategy Recommendations

Table 62 summarizes the key financial differences between the end of life scenario and the lifecycle activities scenario:

Table 62 Budget Scenario Comparison - Tax-Funded Assets

				Annual Tax Change Required			
Scenario	Annual Requirement	Current Annual Funding	Current Annual Deficit	5 Years	10 Years	15 Years	20 Years
End of Life	5,499,000	1,945,000	3,554,000	6.2%	3.1%	2.1%	1.5%
Lifecycle Activities	5,215,000	1,945,000	3,270,000	5.6%	2.8%	1.9%	1.4%
Change:	**284,000**	**0**	**284,000**	**0.6%**	**0.3%**	**0.2%**	**0.1%**

Considering all of the above information, we recommend the lifecycle activities strategy and the 20-year option in **Table 61** that includes the funding changes. This involves full funding being achieved over 20 years by:

a) increasing tax revenues by 1.4% each year for the next 20 years solely for the purpose of phasing in full funding to the asset categories covered in this section of the AMP

b) when realized, reallocating the debt cost reductions of $80,000 to the infrastructure deficit as outlined above

c) allocating the current gas tax and OCIF revenue as outlined in Table 7 (see note below)

d) allocating the scheduled OCIF grant increases to the infrastructure deficit as they occur

e) increasing existing and future infrastructure budgets by the applicable inflation index on an annual basis in addition to the deficit phase-in

Notes:

1. As in the past, periodic senior government infrastructure funding will most likely be available during the phase-in period. By Provincial AMP rules, this periodic funding cannot be incorporated into an AMP unless there are firm commitments in place. We have included OCIF formula based funding, if applicable, since this funding is a multi-year commitment.

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2. We realize that raising tax revenues by the amounts recommended above for infrastructure purposes will be very difficult to do. However, considering a longer phase-in window may have even greater consequences in terms of infrastructure failure.

Although this option achieves full funding on an annual basis in 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 $1,799,000 for machinery & equipment $1,861,000 for Fleet and $7,486,000 for Storm Sewer System. 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.

9.4 Financial Profile: Rate Funded Assets

9.4.1 Current Funding Position – End of Life Scenario

Table 63 and **Table 64** outline, by asset category, Fort Frances' average annual capital requirements, current funding positions and funding increases required to achieve full funding on assets funded by rates.

Table 63 Summary of Infrastructure Requirements & Current Funding Available – End of Life Scenario

Asset Category	Average Annual Investment Required	2018 Annual Funding Available				Annual Deficit/Surplus
		Rates	Less: Allocated to Operations	Other	Total Funding Available	
Sanitary Sewer Network	1,357,000	2,569,000	-1,802,000	0	767,000	590,000
Water System	1,464,000	2,766,000	-1,773,000	0	993,000	471,000
Total:	**2,821,000**	**5,335,000**	**-3,575,000**	**0**	**1,760,000**	**1,061,000**

Under the end of life replacement scenario, the average annual capital requirement for the Water System and Sanitary Sewer Network is $2,821,000. Annual revenue currently allocated to these assets for capital purposes is $1,760,000 leaving an annual deficit of $1,061,000. To put it another way, these infrastructure categories are currently funded at 62% of their long-term capital requirements.

In 2018, Fort Frances has annual sanitary revenues of $2,766,000 and annual water revenues of $2,569,000. As illustrated in **Table 64**, without consideration of any other sources of revenue, full funding would require the following changes over time:

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Table 64 Rate Increase Required for Full Funding

Asset Category	Rate Change Required for Full Funding
Sanitary Sewer Network	21.8%
Water System	18.1%

Through **Table 65**, 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:

Table 65 Summary of Infrastructure Requirements and Current Funding Available – End-of-Life Scenario

	Sanitary Sewer Network				Water System			
	5 Years	10 Years	15 Years	20 Years	5 Years	10 Years	15 Years	20 Years
Infrastructure Deficit	561,000	561,000	561,000	561,000	500,000	500,000	500,000	500,000
Rate Increase Required	21.8%	21.8%	21.8%	21.8%	18.1%	18.1%	18.1%	18.1%
Annually:	**4.4%**	**2.2%**	**1.5%**	**1.1%**	**3.6%**	**1.8%**	**1.2%**	**0.9%**

9.4.2 Current Funding Position – Lifecycle Activities Scenario

As described in this report, investing in a lifecycle activity strategy (as opposed to an end of life replacement strategy) would enable Fort Frances to lower its average annual capital requirements by $87,000. **Table 72** summarizes the difference:

Table 66 Annual Capital Requirements Comparison – End of Life vs. Lifecycle Activities

	Annual Capital Requirements		
	End of Life	Lifecycle Activities	Change
Sanitary Sewer Network	1,357,000	1,270,000	87,000
Water System	1,464,000	1,464,000	0
Total:	**2,821,000**	**2,734,000**	**87,000**
Note:			
Change is net of annual cost of lifecycle activities			

Table 67 and **Table 68** restate, by asset category, Fort Frances's average annual asset investment requirements, current funding positions, and funding increases required to achieve full funding on assets funded by rates under the lifecycle activities scenario. The

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bottom line difference to the information presented in the end of life scenario is that annual requirements and the annual deficit both decrease by $123,000. Current funding remains unchanged.

Table 67 Summary of Infrastructure Requirements & Current Funding Available - Lifecycle Activities Scenario

Asset Category	Average Annual Investment Required - Lifecycle Activities	2018 Annual Funding Available				Annual Deficit/Surplus
		Rates	Less: Allocated to Operations	Other	Total Funding Available	
Sanitary Sewer Network	1,270,000	2,569,000	-1,773,000	0	796,000	474,000
Water System	1,464,000	2,766,000	-1,802,000	0	964,000	500,000
Total:	2,734,000	5,335,000	-3,575,000	0	1,760,000	974,000

Under the lifecycle activities scenario, the average annual investment requirement for sanitary services and water services is $2,734,000. Annual revenue currently allocated to these assets for capital purposes is $1,760,000 leaving an annual deficit of $974,000. To put it another way, these infrastructure categories are currently funded at 64% of their long-term requirements.

In 2018, Fort Frances has annual sanitary revenues of $2,766,000 and annual water revenues of $2,569,000. As illustrated in **Table 68**, without consideration of any other sources of revenue, full funding would require the following changes over time:

Table 68 Rate Increase Required for Full Funding - Lifecycle Activities Scenario

	Rate Change Required for Full Funding
Sanitary Sewer Network	18.5%
Water System	18.1%

Through **Table 69**, 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:

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Table 69 Summary of Infrastructure Requirements and Current Funding Available – Lifecycle Activities Scenario

	Sanitary Sewer Network				Water System			
	5 Years	10 Years	15 Years	20 Years	5 Years	10 Years	15 Years	20 Years
Infrastructure Deficit	474,000	474,000	474,000	474,000	500,000	500,000	500,000	500,000
Rate Increase Required	18.5%	18.5%	18.5%	18.5%	18.1%	18.1%	18.1%	18.1%
Annually:	**3.7%**	**1.9%**	**1.2%**	**0.9%**	**3.6%**	**1.8%**	**1.2%**	**0.9%**

9.4.3 Financial Strategy Recommendations

Table 70 summarizes the key financial differences between the end of life scenario and the lifecycle activities scenario for the Sanitary Sewer Network.

Table 70 Budget Scenario Comparison - Sanitary Sewer Network

				Annual Rate Change Required (Sanitary Sewer Network)			
Scenario	Annual Requirement	Current Annual Funding	Current Annual Deficit	5 Years	10 Years	15 Years	20 Years
End of Life	1,357,000	796,000	561,000	4.4%	2.2%	1.5%	1.1%
Lifecycle Activities	1,270,000	796,000	474,000	3.7%	1.9%	1.2%	0.9%
Change:	**87,000**	**0**	**87,000**	**0.7%**	**0.3%**	**0.3%**	**0.2%**

Table 71 summarizes the key financial differences between the end of life scenario and the lifecycle activities scenario for the Water Network.

Table 71 Budget Scenario Comparison - Water Network

				Annual Rate Change Required (Water System)			
Scenario	Annual Requirement	Current Annual Funding	Current Annual Deficit	5 Years	10 Years	15 Years	20 Years
End of Life	1,464,000	964,000	500,000	3.6%	1.8%	1.2%	0.9%
Lifecycle Activities	1,464,000	964,000	500,000	3.6%	1.8%	1.2%	0.9%

Considering all of the above information, we recommend the following:

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For Sanitary Sewer Network:

We recommend the lifecycle activities strategy and 15-year option in **Table 70**. This involves full funding being achieved over 15 years by:

a) increasing rate revenues by 1.2% for sanitary services each year for the next 15 years solely for the purpose of phasing in full funding

b) increasing future infrastructure budgets by the applicable inflation index on an annual basis

For Water System:

We recommend the lifecycle activities strategy and the 15-year option in **Table 71**. This involves full funding being achieved over 15 years by:

a) increasing rate revenues by 1.2% for water services each year for the next 15 years solely for the purpose of phasing in full funding

b) increasing future infrastructure budgets by the applicable inflation index on an annual basis

Notes:

1. As in the past, periodic senior government infrastructure funding will most likely be available during the phase-in period. By Provincial AMP rules, this periodic funding cannot be incorporated into an AMP unless there are firm commitments in place. We have included OCIF formula-based funding, if applicable, since this funding is a multi-year commitment.

2. We realize that raising rate revenues for infrastructure purposes will be very difficult to do. However, considering a longer phase-in window may have even greater consequences in terms of infrastructure failure.

3. Any increase in rates required for operations would be in addition to the above recommendations.

Although this option achieves full funding on an annual basis 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 $30,674,000 for sanitary services and $10,317,000 for water services. 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.

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9.5 Use of Debt

For reference purposes, the following table outlines the premium paid on a project if financed by debt. For example, a $1M project financed at 3.0%[2] 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 take into account the time value of money or the effect of inflation on delayed projects.

Table 72 Total Interest Paid as a % of Project Costs

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

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

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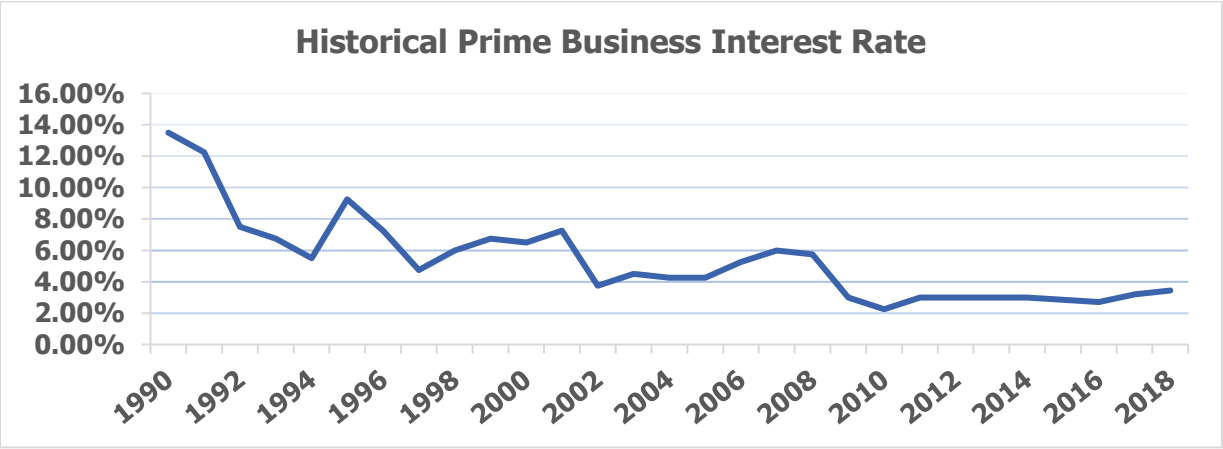
It should be noted that current interest rates are near all-time lows. Sustainable funding models that include debt need to incorporate the risk of rising interest rates. The following graph shows where historical lending rates have been:



As illustrated in **Table 72**, 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.

Table 73 and **Table 74** outline how Fort Frances has historically used debt for investing in the asset categories as listed. There is currently $83,000 of debt outstanding for the assets covered by this AMP with corresponding principal and interest payments of $84,000, well within its provincially prescribed maximum of $5,272,000.

Table 73 Overview of Use of Debt

Asset Category	Current Debt Outstanding	Use of Debt in the Last Five Years				
		2013	2014	2015	2016	2017
Road Network	0	0	0	0	0	0
Storm Sewer System	0	0	0	0	0	0
Bridges	83,000	0	0	0	0	0
Social Housing	0	0	0	0	0	0
Machinery & Equipment	0	0	0	0	0	0
Fleet	0	0	0	0	0	0
Total Tax Funded:	83,000	0	0	0	0	0
Sanitary Sewer Network	0	0	0	0	0	0
Water System	0	0	0	0	0	0
Total Rate Funded:	0	0	0	0	0	0

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Table 74 Overview of Debt Costs

Asset Category	Principal & Interest Payments in the Next Ten Years						
	2018	2019	2020	2021	2022	2023	2028
Road Network	0	0	0	0	0	0	0
Storm Sewer System	0	0	0	0	0	0	0
Bridges	84,000	0	0	0	0	0	0
Social Housing	0	0	0	0	0	0	0
Machinery & Equipment	0	0	0	0	0	0	0
Fleet	0	0	0	0	0	0	0
Total Tax Funded:	**84,000**	**0**	**0**	**0**	**0**	**0**	**0**
Sanitary Sewer Network	0	0	0	0	0	0	0
Water System	0	0	0	0	0	0	0
Total Rate Funded:	**0**	**0**	**0**	**0**	**0**	**0**	**0**

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

9.6 Use of Reserves

9.6.1 Available Reserves

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

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

By asset category, **Table 75** outlines the details of the reserves currently available to Fort Frances.

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Table 75 Summary of Reserves Available

Asset Category	Balance at December 31, 2017
Road Network	790,000
Storm Sewer System	790,000
Bridges	790,000
Social Housing	0
Machinery & Equipment	410,000
Fleet	410,000
Total Tax Funded:	**3,190,000**
Sanitary Sewer Network	0
Water System	0
Total Rate Funded:	**5,392,000**

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

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

The reserves in **Table 75** are available for use by applicable asset categories during the phase-in period to full funding. This coupled with Fort Frances' judicious use of debt in the past, allows the scenarios to assume that, if required, available reserves and debt capacity can be used for high priority and emergency infrastructure investments in the short to medium-term.

9.6.2 Recommendation

As Fort Frances updates its AMP and expands it to include other asset categories, we recommend that future planning should include determining what its long-term reserve balance requirements are and a plan to achieve such balances.

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Appendix A: Infrastructure Report Card

Table 76 Infrastructure Report Card Description

Financial Capacity		A municipality's financial capacity grade is determined by the level of funding available (0-100%) for each asset category for the purpose of meeting the average annual investment requirements.
Asset Health		Using either field inspection data as available or age-based data, the asset health component of the report card uses condition (0-100%) to estimate how capable assets are in performing their required functions. We use replacement cost to determine the weight of each condition group within the asset category.
Letter Grade	Rating	Description
A	Very Good	The asset is functioning and performing well; only normal preventive maintenance is required. The municipality is fully prepared for its long-term replacement needs based on its existing infrastructure portfolio.
B	Good	The municipality is well prepared to fund its long-term replacement needs but requires additional funding strategies in the short-term to begin to increase its reserves.
C	Fair	The asset's performance or function has started to degrade and repair/rehabilitation is required to minimize lifecycle cost. The municipality is underpreparing to fund its long-term infrastructure needs. The replacement of assets in the short- and medium-term will likely be deferred to future years.
D	Poor	The asset's performance and function is below the desired level and immediate repair/rehabilitation is required. The municipality is not well prepared to fund its replacement needs in the short-, medium- or long-term. Asset replacements will be deferred and levels of service may be reduced.
F	Very Poor	The municipality is significantly underfunding its short-term, medium-term, and long-term infrastructure requirements based on existing funds allocation. Asset replacements will be deferred indefinitely. The municipality may have to divest some of its assets (e.g., bridge closures, arena closures) and levels of service will be reduced significantly.

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Table 77 Asset Health Grading Scale

Letter Grade	Rating	Description
A	Excellent	Asset is new or recently rehabilitated
B	Good	Asset is no longer new, but is fulfilling its function. Preventive maintenance is beneficial at this stage.
C	Fair	Deterioration is evident but asset continues to full its function. Preventive maintenance is beneficial at this stage.
D	Poor	Significant deterioration is evident and service is at risk.
F	Very Poor	Asset is beyond expected life and has deteriorated to the point that it may no longer be fit to fulfill its function.

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Table 78 Asset Health Grade

Client:	Infrastructure Report Card Fort Frances																	
Asset Category	1. Asset Health																	
Road Network	Replacement Value	Percentage of Overall	Very Good		Good		Fair		Poor		Very Poor		AHP	FCP	Asset Health Grade	Financial Capacity Grade	Point Average	Category Grade
			Percentage	Pts.	Percentage	Pts.	Percentage	Pts.	Percentage	Pts.	Percentage	Pts.						
	$ 106,506,693	30.0%	3.0%	0.2	22.0%	0.9	55.0%	1.7	18.0%	0.4	1.0%	0.0	3.1	2.0	C	D	2.53	D
Sanitary Sewer Network	Replacement Value	Percentage of Overall	Very Good		Good		Fair		Poor		Very Poor		AHP	FCP	Asset Health Grade	Financial Capacity Grade	Point Average	Category Grade
			Percentage	Pts.	Percentage	Pts.	Percentage	Pts.	Percentage	Pts.	Percentage	Pts.						
	$ 84,308,093	23.8%	14.0%	0.7	10.0%	0.4	31.0%	0.9	9.0%	0.2	37.0%	0.4	2.6	3.0	D	C	2.79	D
Water System	Replacement Value	Percentage of Overall	Very Good		Good		Fair		Poor		Very Poor		AHP	FCP	Asset Health Grade	Financial Capacity Grade	Point Average	Category Grade
			Percentage	Pts.	Percentage	Pts.	Percentage	Pts.	Percentage	Pts.	Percentage	Pts.						
	$ 81,783,088	23.1%	22.0%	1.1	7.0%	0.3	6.0%	0.2	40.0%	0.8	24.0%	0.2	2.6	3.0	D	C	2.80	D
Storm Sewer System	Replacement Value	Percentage of Overall	Very Good		Good		Fair		Poor		Very Poor		AHP	FCP	Asset Health Grade	Financial Capacity Grade	Point Average	Category Grade
			Percentage	Pts.	Percentage	Pts.	Percentage	Pts.	Percentage	Pts.	Percentage	Pts.						
	$ 60,898,523	17.2%	19.0%	1.0	48.0%	1.9	7.0%	0.2	6.0%	0.1	20.0%	0.2	3.4	0.0	C	F	1.70	F
Bridges	Replacement Value	Percentage of Overall	Very Good		Good		Fair		Poor		Very Poor		AHP	FCP	Asset Health Grade	Financial Capacity Grade	Point Average	Category Grade
			Percentage	Pts.	Percentage	Pts.	Percentage	Pts.	Percentage	Pts.	Percentage	Pts.						
	$ 9,490,000	2.7%	0.0%	0.0	74.0%	3.0	26.0%	0.8	0.0%	0.0	0.0%	0.0	3.7	0.0	C	F	1.87	F
Machinery & Equipment	Replacement Value	Percentage of Overall	Very Good		Good		Fair		Poor		Very Poor		AHP	FCP	Asset Health Grade	Financial Capacity Grade	Point Average	Category Grade
			Percentage	Pts.	Percentage	Pts.	Percentage	Pts.	Percentage	Pts.	Percentage	Pts.						
	$ 4,755,364	1.3%	28.0%	1.4	9.0%	0.4	3.0%	0.1	17.0%	0.3	44.0%	0.4	2.6	1.0	D	F	1.82	F
Fleet	Replacement Value	Percentage of Overall	Very Good		Good		Fair		Poor		Very Poor		AHP	FCP	Asset Health Grade	Financial Capacity Grade	Point Average	Category Grade
			Percentage	Pts.	Percentage	Pts.	Percentage	Pts.	Percentage	Pts.	Percentage	Pts.						
	$ 4,622,049	1.3%	7.0%	0.4	14.0%	0.6	8.0%	0.2	3.0%	0.1	68.0%	0.7	1.9	1.0	F	F	1.45	F
Social Housing	Replacement Value	Percentage of Overall	Very Good		Good		Fair		Poor		Very Poor		AHP	FCP	Asset Health Grade	Financial Capacity Grade	Point Average	Category Grade
			Percentage	Pts.	Percentage	Pts.	Percentage	Pts.	Percentage	Pts.	Percentage	Pts.						
	$ 2,148,222	0.6%	0.0%	0.0	0.0%	0.0	100.0%	3.0	0.0%	0.0	0.0%	0.0	3.0	0.0	C	F	1.50	F

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Table 79 Financial Capacity Grade Scale

Letter Grade	Rating	Funding percent	Timing Requirements	Description
A	Excellent	90-100 percent	☑ Short Term ☑Medium Term ☑Long Term	The municipality is fully prepared for its short-, medium- and long-term replacement needs based on existing infrastructure portfolio.
B	Good	70-89 percent	☑Short Term ☑Medium Term ☒Long Term	The municipality is well prepared to fund its short-term and medium-term replacement needs but requires additional funding strategies in the long-term to begin to increase its reserves.
C	Fair	60-69 percent	☑Short Term ☒Medium Term ☒Long Term	The municipality is underprepared to fund its medium- to long-term infrastructure needs. The replacement of assets in the medium-term will likely be deferred to future years.
D	Poor	40-59 percent	☒/☑ Short Term ☒Medium Term ☒Long Term	The municipality is not well prepared to fund its replacement needs in the short-, medium- or long-term. Asset replacements will be deferred and levels of service may be reduced.
F	Very Poor	0-39 percent	☒Short Term ☒Medium Term ☒Long Term	The municipality is significantly underfunding its short-term, medium-term, and long-term infrastructure requirements based on existing funds allocation. Asset replacements will be deferred indefinitely. The municipality may have to divest some of its assets (e.g., bridge closures, arena closures) and levels of service will be reduced significantly.

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Table 80 Financial Capacity Grade

Asset Category	Annual Requirement	Available	% Funded	2. Financial Capacity Grade	Points
Road Network	$ 3,266,000	$ 1,512,000	46.3%	D	2.0
Sanitary Sewer Network	$ 1,270,000	$ 796,000	62.7%	C	3.0
Water System	$ 1,464,000	$ 964,000	65.8%	C	3.0
Storm Sewer System	$ 998,000	$ 145,000	14.5%	F	0.0
Bridges	$ 190,000	$ 28,000	14.7%	F	0.0
Machinery & Equipment	$ 333,000	$ 123,000	36.9%	F	1.0
Fleet	$ 385,000	$ 131,000	34.0%	F	1.0
Social Housing	$ 43,000	$ 6,000	14.0%	F	0.0
Total	$ 7,949,000	$ 3,705,000	46.6%	D	2.0

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Appendix B: Lifecycle Activity Requirements

The following tables identify the cost of capital lifecycle activities that would need to be undertaken to maintain the current level of service provided by the Town's infrastructure. This data includes both end-of-life replacement and lifecycle activities.

Road Network

Asset Segment	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Paved	$449,985	$1,396,435	$1,104,918	$859,619	$1,590,220	$663,889	$340,414	$2,735,621	$3,567,860	$3,726,457
Total:	$449,985	$1,396,435	$1,104,918	$859,619	$1,590,220	$663,889	$340,414	$2,735,621	$3,567,860	$3,726,457

Bridges

Asset Segment	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Caul Bridge	$2,000	$0	$0	$0	$0	$0	$0	$0	$0	$0
CN Underpass	$0	$0	$0	$0	$570,000	$0	$0	$0	$0	$0
Mill Road Overpass	$0	$0	$0	$0	$350,000	$0	$0	$0	$0	$0
Total:	$2,000	$0	$0	$0	$920,000	$0	$0	$0	$0	$0

Water System

Asset Segment	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Hydrants	$174,889	$65,583	$0	$393,500	$21,861	$153,028	$896,305	$65,583	$262,333	$43,722
Water Mains	$1,200,367	$2,064,923	$2,013,289	$1,063,367	$1,541,719	$0	$207,067	$0	$0	$0
Water Valves	$6,073	$12,145	$15,181	$34,722	$54,965	$82,334	$33,035	$73,784	$72,099	$3,191
Total:	$1,381,329	$2,142,651	$2,028,470	$1,491,588	$1,618,545	$235,361	$1,136,407	$139,368	$334,432	$46,913

Sanitary Sewer Network

Asset Segment	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Sanitary Manholes	$47,767	$71,650	$191,066	$310,482	$71,650	$143,300	$71,650	$286,599	$143,300	$0
Sanitary Sewer Mains	$387,756	$277,099	$360,520	$83,523	$0	$0	$0	$1,455,460	$523,237	$461,511
Sanitary Valves	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0

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Treatment Plant	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total:	$435,523	$348,749	$551,586	$394,005	$71,650	$143,300	$71,650	$1,742,059	$666,536	$461,511

Storm Sewer System

Asset Segment	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Catchbasin Manholes	$137,863	$260,407	$91,908	$306,361	$153,181	$229,771	$45,954	$306,361	$30,636	$91,908
Catchbasins	$91,088	$115,378	$66,798	$145,741	$273,264	$157,886	$78,943	$139,668	$30,363	$54,653
Ditch Inlets	$0	$42,205	$0	$1,994	$9,151	$0	$63,447	$66,897	$0	$0
Outfalls	$0	$0	$0	$74,754	$0	$55,550	$0	$133,313	$428,359	$0
Storm Manholes	$315,512	$374,671	$78,878	$157,756	$19,720	$59,159	$78,878	$157,756	$19,720	$19,720
Total:	$544,463	$792,661	$237,584	$686,606	$455,315	$502,365	$267,222	$803,996	$509,077	$166,281

Machinery & Equipment

Asset Segment	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Airport Equipment	$0	$0	$0	$0	$0	$13,773	$0	$0	$22,063	$0
Fire Emergency Services Equipment	$0	$38,800	$31,546	$104,718	$0	$3,928	$72,988	$0	$0	$9,159
Parks and Recreation Equipment	$0	$0	$0	$127,689	$0	$37,268	$16,010	$2,544	$0	$0
Public Works Equipment	$123,498	$11,027	$6,417	$424,798	$0	$200,195	$7,168	$69,499	$16,990	$120,130
Total:	$123,498	$49,827	$37,963	$657,205	$0	$255,164	$96,166	$72,043	$39,053	$129,289

Fleet

Asset Segment	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Administration & Finance	$0	$0	$0	$0	$0	$0	$0	$28,382	$0	$0
Airport	$0	$0	$0	$0	$0	$0	$0	$34,895	$0	$0
Community Service	$0	$0	$0	$0	$30,126	$0	$107,370	$105,132	$0	$0
Fire	$0	$0	$0	$341,942	$0	$0	$89,937	$0	$0	$0
Parks	$29,789	$29,836	$0	$27,763	$28,551	$0	$79,635	$200,691	$29,836	$0
Planning & Development	$67,068	$0	$0	$0	$0	$0	$0	$67,068	$0	$0
Public Works	$155,684	$676,532	$0	$175,586	$68,238	$0	$0	$402,758	$0	$260,191
Total:	$252,541	$706,368	$0	$545,291	$126,915	$0	$276,942	$838,926	$29,836	$260,191

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Social Housing

Asset Segment	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Non-Profit Housing - Victoria	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Non-Profit Housing - Christie	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total:	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**

Cumulative Total (All Assets)

Asset Category	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Road Network	$449,985	$1,396,435	$1,104,918	$859,619	$1,590,220	$663,889	$340,414	$2,735,621	$3,567,860	$3,726,457
Bridges	$2,000	$0	$0	$0	$920,000	$0	$0	$0	$0	$0
Water System	$1,381,329	$2,142,651	$2,028,470	$1,491,588	$1,618,545	$235,361	$1,136,407	$139,368	$334,432	$46,913
Sanitary Sewer Network	$435,523	$348,749	$551,586	$394,005	$71,650	$143,300	$71,650	$1,742,059	$666,536	$461,511
Storm Sewer System	$544,463	$792,661	$237,584	$686,606	$455,315	$502,365	$267,222	$803,996	$509,077	$166,281
Machinery & Equipment	$123,498	$49,827	$37,963	$657,205	$0	$255,164	$96,166	$72,043	$39,053	$129,289
Fleet	$252,541	$706,368	$0	$545,291	$126,915	$0	$276,942	$838,926	$29,836	$260,191
Social Housing	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total:	**$3,189,338**	**$5,436,690**	**$3,960,521**	**$4,634,313**	**$4,782,645**	**$1,800,080**	**$2,188,801**	**$6,332,012**	**$5,146,796**	**$4,790,641**

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