Key Statistics

$88.4 million Replacement cost of asset portfolio	**$73,050** Replacement cost of infrastructure per capita
2.32% Target average annual infrastructure reinvestment rate	**0.6%** Actual average annual infrastructure reinvestment rate
91% Percentage of assets in fair or better condition	**26%** Percentage of annual infrastructure funding needs currently being met
14% Portion of total infrastructure funding that comes from the Federal Gas Tax	**9%** Annual cost savings for roads through proactive lifecycle management
$1.5 million Annual capital infrastructure deficit	**20 years** Recommended timeframe for eliminating annual infrastructure deficit

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Executive Summary

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

All municipalities in Ontario are required to complete an asset management plan (AMP) in accordance with Ontario Regulation 588/17 (O. Reg. 588/17). This AMP outlines the current state of asset management planning in the Township of Ignace. It identifies the current practices and strategies that are in place to manage public infrastructure and makes recommendations where they can be further refined. Through the implementation of sound asset management strategies, the Township can ensure that public infrastructure is managed to support the sustainable delivery of municipal services.

This AMP includes the following asset categories:

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

The overall replacement cost of the asset categories included in this AMP totals $88.4 million. 91% of all assets analysed in this AMP are in fair or better condition and assessed condition data was available for 36% of assets. For the remaining 64% of assets, assessed condition data was unavailable, and asset age was used to approximate condition – a data gap that persists in most municipalities. Generally, age misstates the true condition of assets, making assessments essential to accurate asset management planning, and a recurring recommendation in this AMP.

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

To meet capital replacement and rehabilitation needs for existing infrastructure, prevent infrastructure backlogs, and achieve long-term sustainability, the Township's average annual capital requirement totals $2 million. Based on a historical analysis of sustainable capital funding sources,

the Township is committing approximately $526,000 towards capital projects per year. As a result, there is currently an annual funding gap of $1.5 million.

A financial strategy was developed to address the annual capital funding gap. The following table compares to total and average annual tax/rate change required to eliminate the Township's infrastructure deficit:

Funding Source	Years Until Full Funding	Total Tax/Rate Change	Average Annual Tax/Rate Change
Tax-Funded Assets	20 Years	43.2%	2.2%
Rate-Funded (Water)	20 Years	37.4%	1.9%
Rate-Funded (Sanitary)	20 Years	41.5%	2.1%

With the development of this AMP the Township has achieved compliance with O. Reg. 588/17 to the extent of the requirements that must be completed by July 1, 2021. There are additional requirements concerning proposed levels of service and growth that must be met by July 1, 2023 and 2024.

This AMP represents a snapshot in time and is based on the best available processes, data, and information at the Township. Strategic asset management planning is an ongoing and dynamic process that requires continuous improvement and dedicated resources. Several recommendations have been developed to guide the continuous refinement of the Township's asset management program. These include:

a) asset inventory data review and validation
b) the formalization of condition assessment strategies
c) the implementation of risk-based decision-making as part of asset management planning and budgeting
d) the continuous review, development and implementation of optimal lifecycle management strategies
e) the identification of proposed levels of service

The evaluation of the above items and further development of a data-driven, best-practice approach to asset management is recommended to ensure the Township is providing optimal value through its management of infrastructure and delivery of services.

1 Introduction & Context

Key Insights

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

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

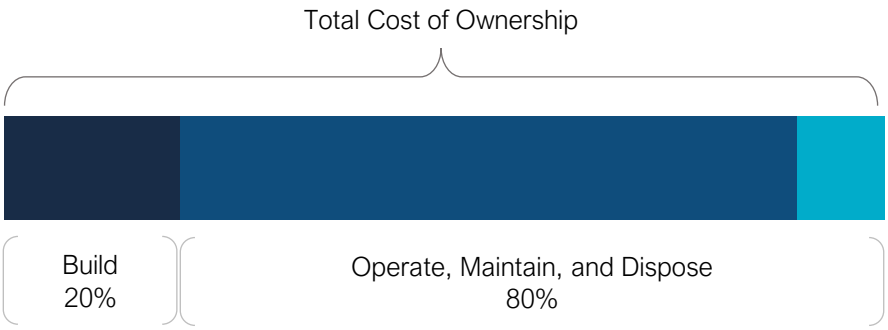
- An asset management plan is a living document that should be updated regularly to inform long-term planning

- Ontario Regulation 588/17 outlines several key milestone and requirements for asset management plans in Ontario between July 1, 2021 and 2024

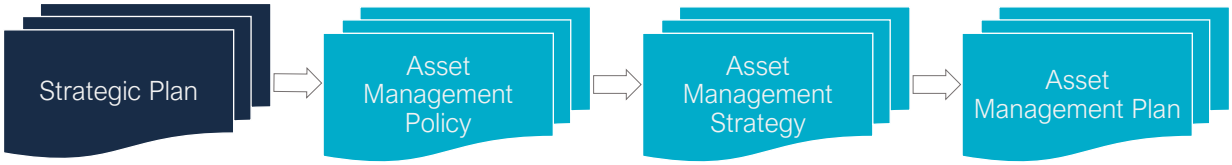
1.1 An Overview of Asset Management

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

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



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



The diagram, adopted from the Institute of Asset Management (IAM), illustrates the concept of 'line of sight', or alignment between the corporate strategic plan and various asset management documents. The strategic plan has a direct, and cascading impact on asset management planning and reporting.

1.1.1 Asset Management Policy

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

The Township's Asset Management Policy was developed in 2018 and includes the following Key Principles to guide asset management decision-making:

- Forward-looking
- Fiscally Sustainable
- Evidence-based
- Reliable
- Accessible
- Innovative
- Health & Safety
- Strategically Aligned
- Environmentally Conscious
- Service-Focused

1.1.2 Asset Management Strategy

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

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

1.1.3 Asset Management Plan

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

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

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

1.2 Key Concepts in Asset Management

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

1.2.1 Lifecycle Management Strategies

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

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

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

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

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

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

1.2.2 Risk Management Strategies

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

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

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

1.2.3 Levels of Service

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

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

Community Levels of Service

Community levels of service are a simple, plain language description or measure of the service that the community receives. For core asset categories (Roads, Bridges & Culverts, Water, Wastewater, Stormwater) the Province, through O. Reg. 588/17, has provided qualitative descriptions that are required to be included in this AMP. For non-core asset categories, the Township has not yet completed the qualitative descriptions that will be used to determine the community level of service provided.

Technical Levels of Service

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

For core asset categories (Roads, Bridges & Culverts, Water, Wastewater, Stormwater) the Province, through O. Reg. 588/17, has provided technical metrics that are required to be included in this AMP. For non-core asset categories, the Township has not yet measured the technical metrics that will be used to determine the technical level of service provided.

Current and Proposed Levels of Service

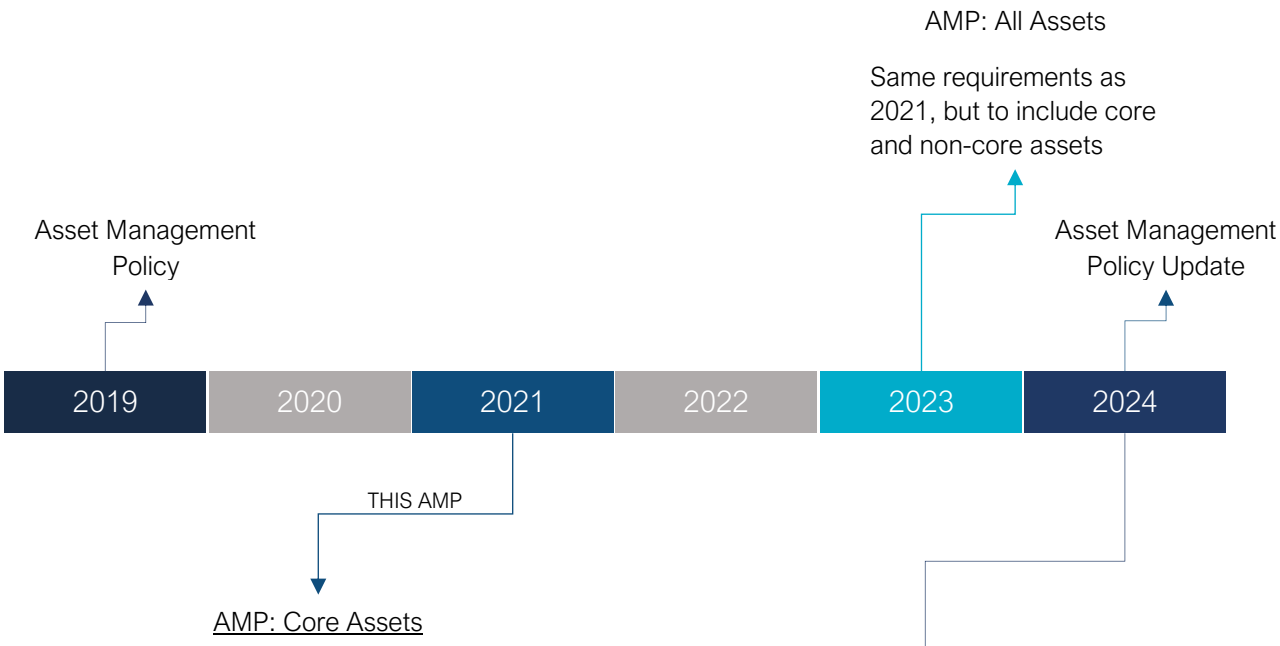
This AMP focuses on measuring the current level of service provided to the community. Once current levels of service have been measured, the Township plans to establish proposed levels of service over a 10-year period, in accordance with O. Reg. 588/17.

Proposed levels of service should be realistic and achievable within the timeframe outlined by the Township. They should also be determined with consideration of a variety of community expectations, fiscal capacity, regulatory requirements, corporate goals and long-term sustainability. Once proposed levels of service have been established, and prior to July 2024, the Township must identify a lifecycle management and financial strategy which allows these targets to be achieved.

1.3 Ontario Regulation 588/17

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

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



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

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

1.3.1 O. Reg. 588/17 Compliance Review

The following table identifies the requirements outlined in Ontario Regulation 588/17 for municipalities to meet by July 1, 2021. Next to each requirement a page or section reference is included in addition to any necessary commentary.

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

1.4 Asset Management Roadmap

As part of PSD's Asset Management Roadmap, the Township of Ignace 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 over a multi-year engagement. The following summarizes key milestones/deliverables achieved throughout this project.

Asset Management Maturity Assessment (Completion Date: November 30th, 2018)
The State of Maturity Report provided an audit of the existing asset management capacity and competency. It outlined strategic recommendations to improve the Township's asset management program.

Condition Assessment Program Development (Completion Date: July 10th, 2018)
Township staff received training on the development of condition assessment strategies for municipal assets. This included condition assessment guidelines as well as data collection templates to ensure asset condition data is collected consistently and updated regularly.

Asset Data Review and Refinement (Completion Date: August 12th, 2019)
Asset inventory data was refined continuously over the course of this project with a focus on creating a link between the Township's GIS and asset register.

Risk and Criticality Model Development (Completion Date: July 23rd, 2019)
Risk models were developed to determine the relative criticality of assets based on their probability and consequence of failure. These models assist with the prioritization and ranking of infrastructure needs.

Lifecycle Model Development (Completion Date: September 27th, 2019)
The Township's lifecycle management strategies were reviewed and documented to determine current practices and identify opportunities for improvement and potential cost avoidance.

Level of Service Framework Development (Completion Date: April 26th, 2019)
A framework was developed to determine the current level of service provided to the community through municipal infrastructure.

AMP & Financial Strategy
This document represents the culminating deliverable of the Asset Management Roadmap.

2 Scope and Methodology

Key Insights

- This asset management plan includes 8 asset categories and is divided between tax-funded and rate-funded categories

- The source and recency of replacement costs impacts the accuracy and reliability of asset portfolio valuation

- Accurate and reliable condition data helps to prevent premature and costly rehabilitation or replacement and ensures that lifecycle activities occur at the right time to maximize asset value and useful life

2.1 Asset Categories

This asset management plan for the Township of Ignace is produced in compliance with Ontario Regulation 588/17. The July 2021 deadline under the regulation—the first of three AMP updates—requires analysis of only core assets (roads, bridges & culverts, water, wastewater, and stormwater). This AMP includes both core and non-core asset categories.

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

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

2.2 Deriving Replacement Costs

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

- User-Defined Cost and Cost/Unit (More Reliable): Based on costs provided by municipal staff which could include average costs from recent contracts; data from engineering reports and assessments; staff estimates based on knowledge and experience

- Cost Inflation/CPI Tables (Less Reliable): Historical cost of the asset is inflated based on Consumer Price Index or Non-Residential Building Construction Price Index

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

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

Asset Category	Replacement Cost Method	
	Cost/Unit	Cost Inflation
Road Network	84%	16%
Storm Sewer Network	97%	3%
Buildings & Facilities	-	100%
Machinery & Equipment	-	100%
Fleet	100%	-
Land Improvements	-	100%
Water Network	35%	65%
Wastewater Network	71%	29%
Overall:	**48%**	**52%**

Replacement costs and costing methods should be regularly reviewed by staff responsible for asset management planning to ensure that long-term planning is based on the best and most up-to-date information.

2.3 Estimated Useful Life and Service Life Remaining

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

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

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

2.4 Reinvestment Rate

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

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

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

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

2.5 Deriving Asset Condition

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

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

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

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

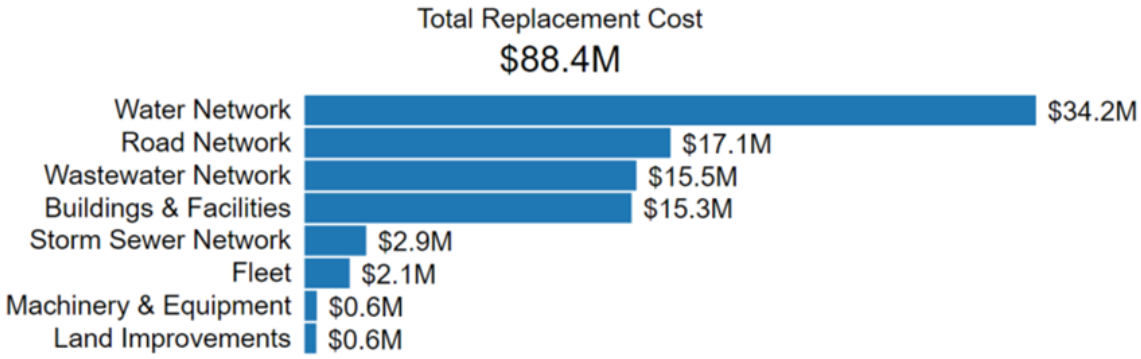
3 Portfolio Overview

Key Insights

- The total replacement cost of the Township's asset portfolio is $88.4 million
- The Township's target re-investment rate is 2.32%, and the actual re-investment rate is 0.6%, contributing to an expanding infrastructure deficit
- 90% of all assets are in fair or better condition
- 16% of assets are projected to require replacement in the next 10 years
- Average annual capital requirements total $2.0 million per year across all assets

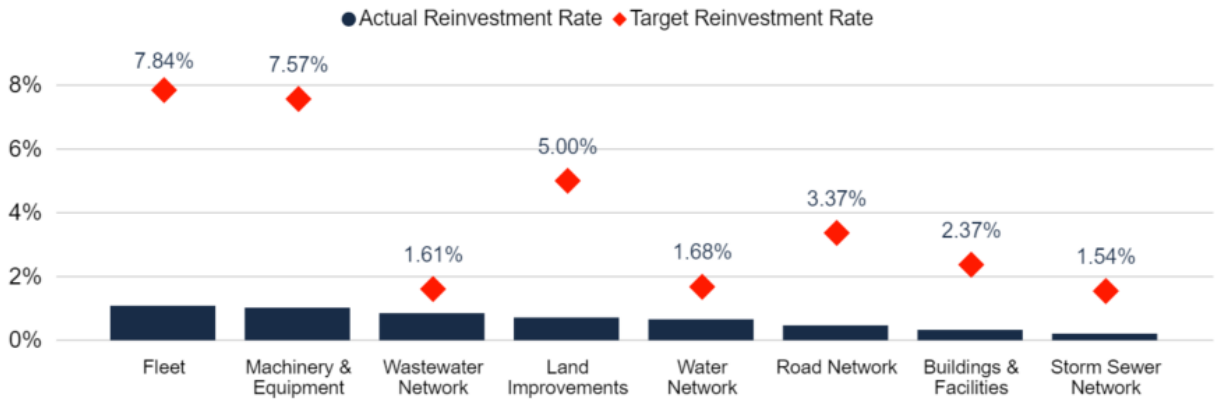
3.1 Total Replacement Cost of Asset Portfolio

The asset categories analyzed in this AMP have a total replacement cost of $88.4 million. This total was determined based on a combination of user-defined costs and historical cost inflation. This estimate reflects replacement of historical assets with similar, not necessarily identical, assets available for procurement today.



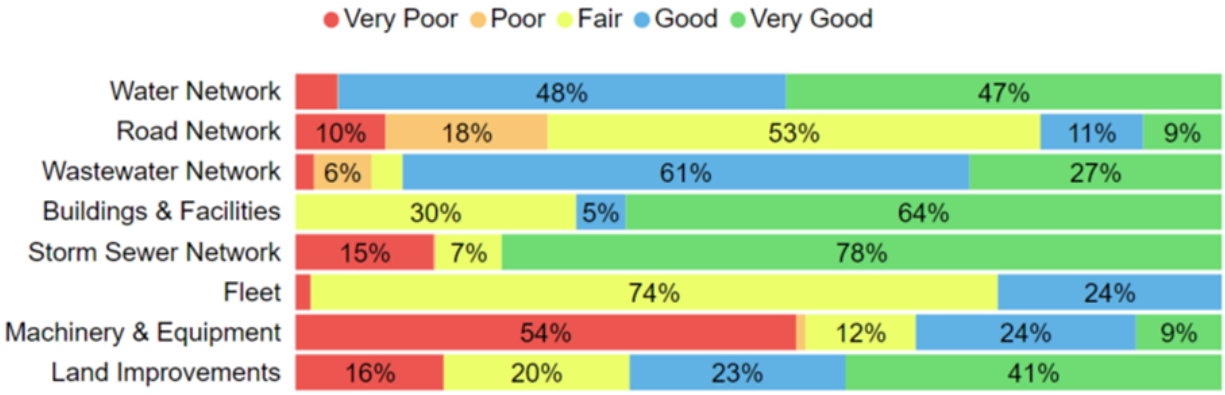
3.2 Target vs. Actual Reinvestment Rate

The graph below depicts funding gaps or surpluses by comparing target vs actual reinvestment rate. To meet the long-term replacement needs, the Township should be allocating approximately $2 million annually, for a target reinvestment rate of 2.32%. Actual annual spending from sustainable revenue sources totals approximately $526,000, for an actual reinvestment rate of 0.6%.



3.3 Condition of Asset Portfolio

The current condition of the assets is central to all asset management planning. Collectively, 90% of assets in Ignace are in fair or better condition. This estimate relies on both age-based and field condition data.

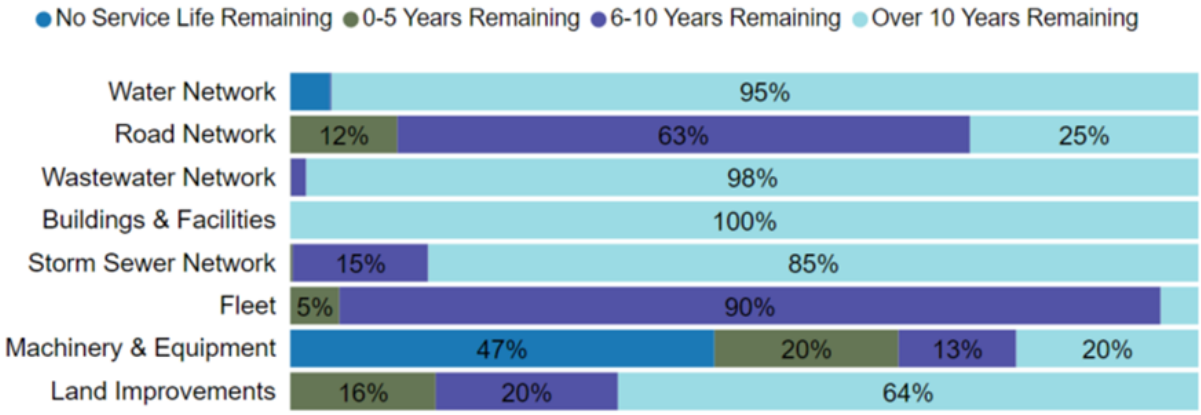


This AMP relies on assessed condition data for 36% of assets; for the remaining portfolio, age is used as an approximation of condition. Assessed condition data is invaluable in asset management planning as it reflects the true condition of the asset and its ability to perform its functions. The table below identifies the source of condition data used throughout this AMP.

Asset Category	Asset Segment	% of Assets with Assessed Condition	Source of Condition Data
Road Network	Paved Roads	100%	2019 Summer Students
Storm Sewer Network	All	0%	Asset Age
Buildings & Facilities	All	100%	2019 PW Staff Assessments
Machinery & Equipment	All	0%	Asset Age
Fleet	All	100%	2019 PW Staff Assessments
Land Improvements	Parking Lots	100%	2019 PW Staff Assessments
Water Network	All	0%	Asset Age
Wastewater Network	All	0%	Asset Age

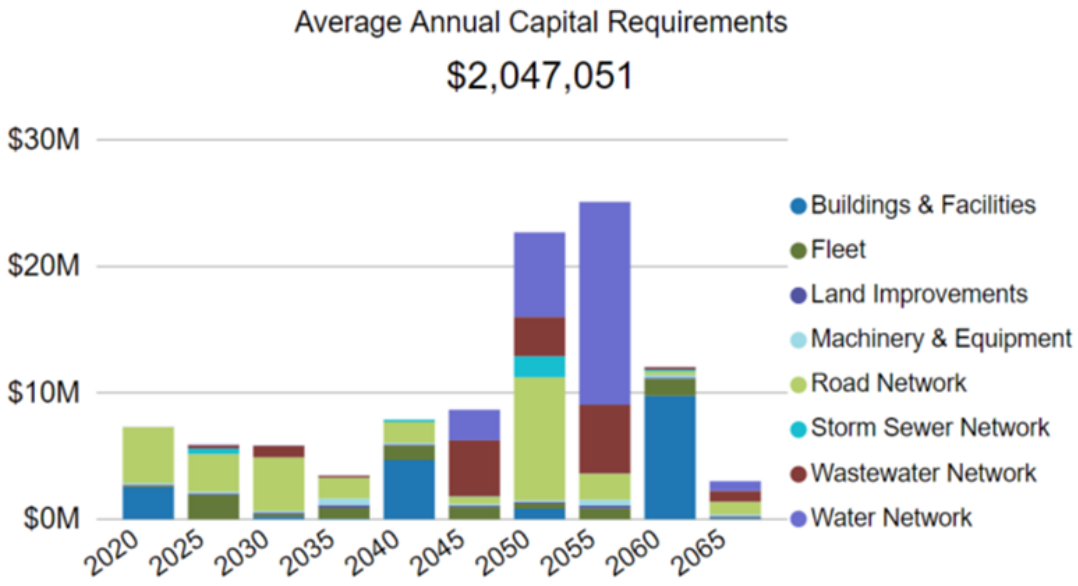
3.4 Service Life Remaining

Based on asset age, available assessed condition data and estimated useful life, 16% of the Township's assets will require replacement within the next 10 years. Capital requirements over the next 10 years are identified in Appendix A.



3.5 Forecasted Capital Requirements

The development of a long-term capital forecast should include both asset rehabilitation and replacement requirements. With the development of asset-specific lifecycle strategies that include the timing and cost of future capital events, the Township can produce an accurate long-term capital forecast. The following graph identifies capital requirements over the next 50 years.



4 Analysis of Tax-funded Assets

Key Insights

- Tax-funded assets are valued at $38.6 million
- 86% of tax-funded assets are in fair or better condition
- The average annual capital requirement to sustain the current level of service for tax-funded assets is approximately $1.2 million
- Critical assets should be evaluated to determine appropriate risk mitigation activities and treatment options

4.1 Road Network

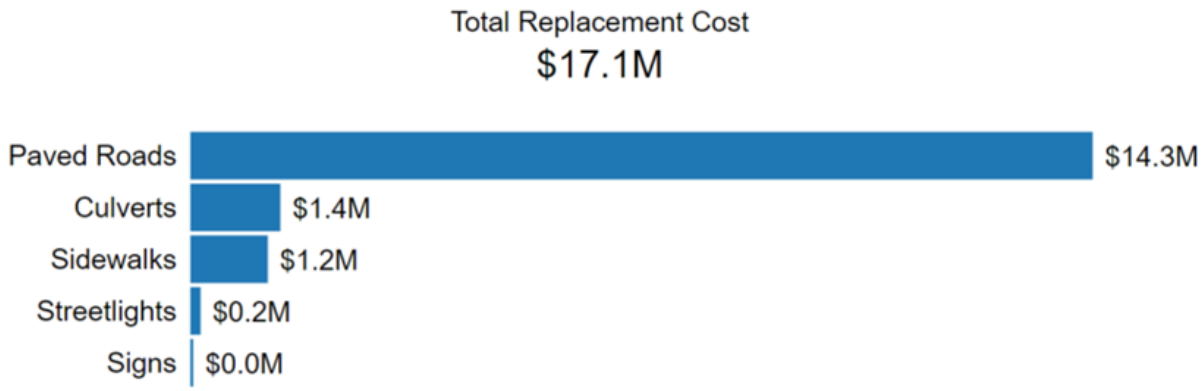
The Road Network is a critical component of the provision of safe and efficient transportation services. It includes all municipally owned and maintained roadways in addition to supporting roadside infrastructure including sidewalks, road culverts, signs, and streetlights.

The Township's Road Network is maintained by the Public Works Department.

4.1.1 Asset Inventory & Replacement Cost

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

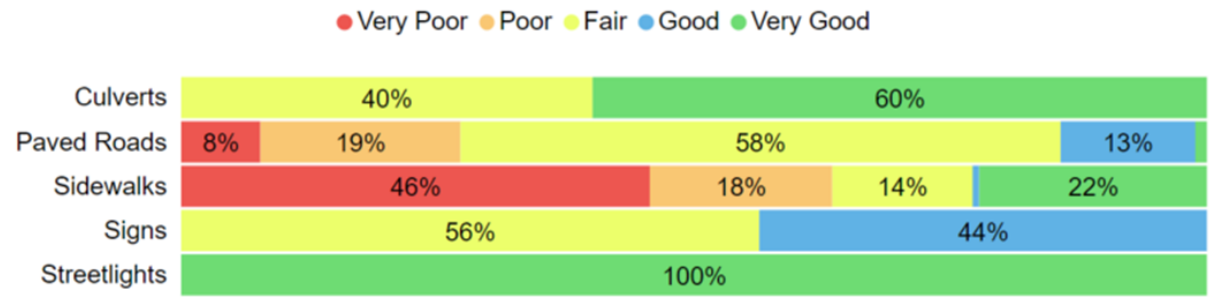
Asset Segment	Quantity	Replacement Cost Method	Total Replacement Cost
Culverts	5 (pooled)	CPI Tables	$1,425,484
Gravel Roads	3,122 m	Not Planned for Replacement	
Paved Roads	20,392 m	Cost/Unit	$14,274,493
Sidewalks	13 (pooled)	CPI Tables	$1,227,031
Signs	2 (pooled)	CPI Tables	$46,694
Streetlights	1 (pooled)	User-Defined Cost	$163,715
			$17,137,417



4.1.2 Asset Condition

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

Asset Segment	Average Condition (%)	Average Condition Rating	Condition Source
Culverts	77%	Good	Age-based Condition
Paved Roads	44%	Fair	Assessed Condition
Sidewalks	37%	Poor	Age-based Condition
Signs	62%	Good	Age-based Condition
Streetlights	80%	Very Good	Age-based Condition
	47%	**Fair**	**83% Assessed Condition**



Current Approach to Condition Assessment

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

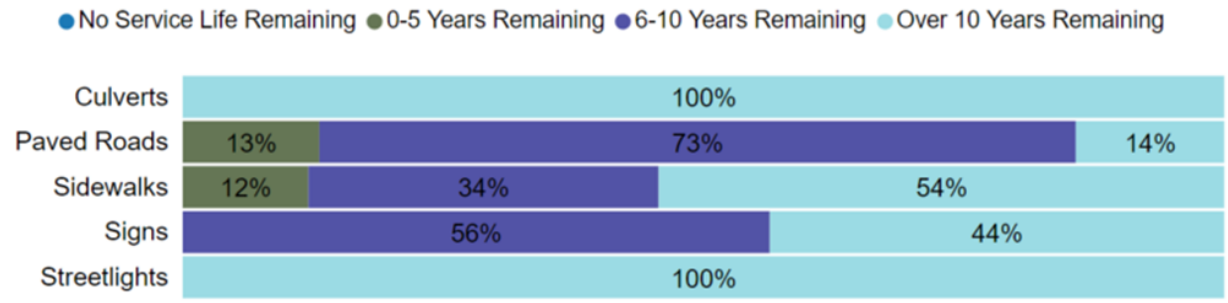
- Staff recently completed network-wide condition assessments for all paved roads in the summer of 2019
- The Township should work towards identifying a regular condition assessment cycle for roads to inform operating and capital budgets, and general asset management planning

4.1.3 Estimated Useful Life & Average Age

The Estimated Useful Life for Road Network assets has been assigned according to a combination of established industry standards and staff knowledge. The Average Age of each asset is based on the number of years each asset has been in-service.

Finally, the Average Service Life Remaining represents the difference between the Estimated Useful Life and the Average Age, except when an asset has been assigned an assessed condition rating. Assessed condition may increase or decrease the average service life remaining.

Asset Segment	Estimated Useful Life (Years)	Average Age (Years)	Average Service Life Remaining (Years)
Culverts	50 Years	18.1	31.9
Paved Roads	50 Years	37.7	8.4
Sidewalks	50 Years	29.6	20.4
Signs	15 Years	5.5	9.5
Streetlights	20 Years	4.0	16.0
		35.2	**10.7**



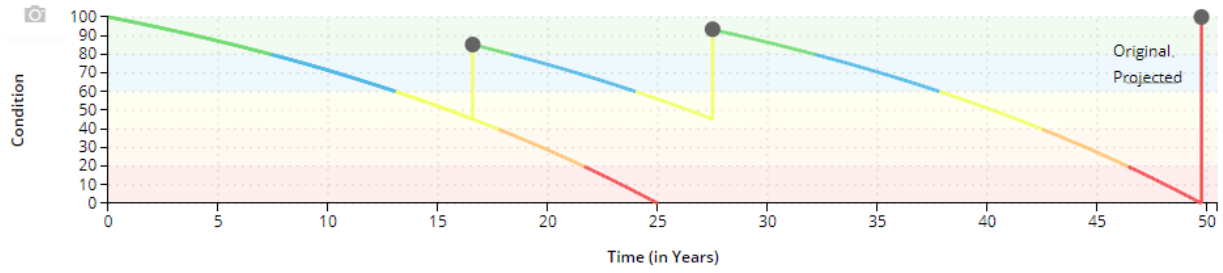
Each asset's Estimated Useful Life should be reviewed periodically to determine whether adjustments need to be made to better align with the observed length of service life for each asset type.

4.1.4 Lifecycle Management Strategy

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

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

Paved Roads		
Event Name	Event Class	Event Trigger
Mill & Hot Mix Overlay (Single Lift)	Rehabilitation	Condition: 45 (~17 Years)
Mill & Hot Mix Overlay (Double Lift)	Rehabilitation	Condition: 45 (~27 Years)
Full Reconstruction	Replacement	~50 Years



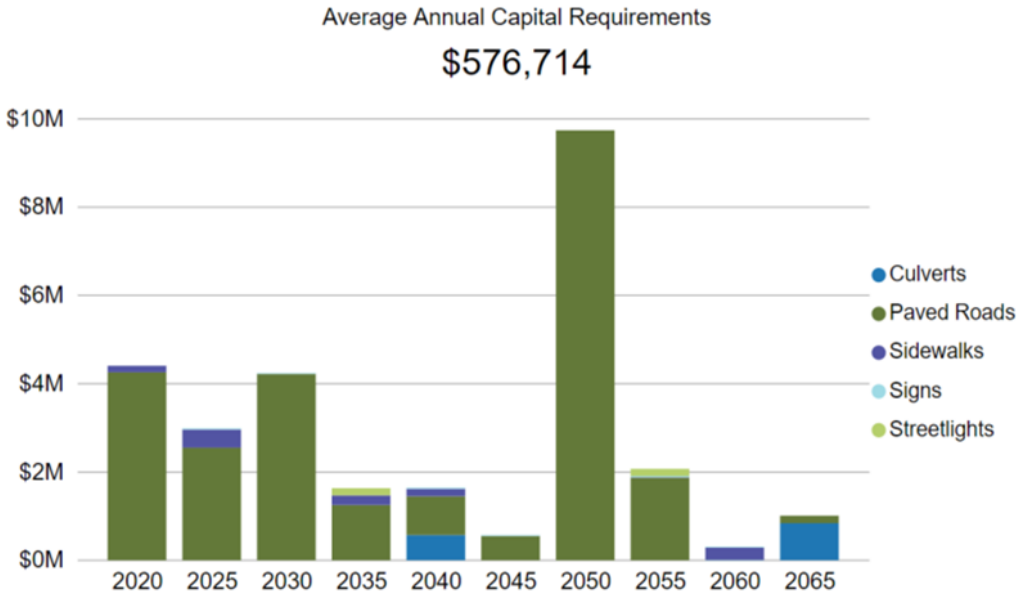
The following table further expands on the Township's current approach to lifecycle management:

Activity Type	Description of Current Strategy
Maintenance	Annual winter control activities to meet Minimum Maintenance Standards including road and sidewalk plowing, snow removal and sanding
	Pothole patching is completed on an as needed basis
Rehabilitation	Road rehabilitation activities are limited and there is no formal program in place to re-surface on a regular schedule
	Township roads have exceeded original life projections and have not exhibited significant surface deterioration
Replacement	Full road reconstruction has not been required often in recent history, but is expected to increase over the next 5-10 years as most roads will approach the end of their useful life
	Most municipal roads were constructed around the same time (early 1970s) and are expected to last approximately 50 years before requiring reconstruction

Forecasted Capital Requirements

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

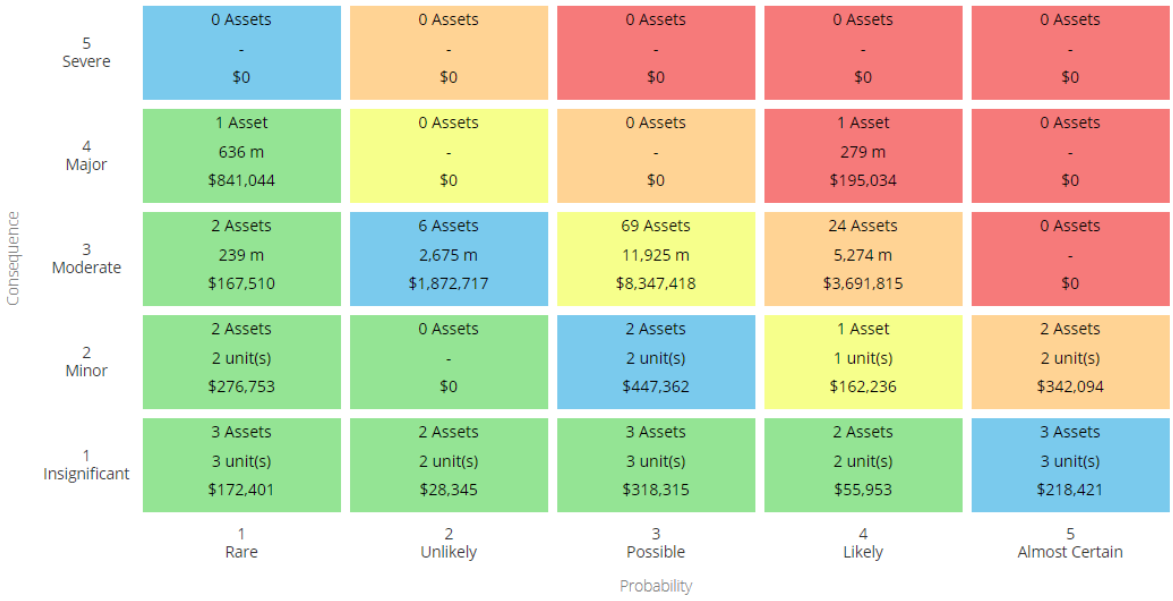
The annual capital requirement represents the average amount per year that the Township should allocate towards funding rehabilitation and replacement needs to meet future capital needs.



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

4.1.5 Risk & Criticality

The following risk matrix provides a visual representation of the relationship between the probability of failure and the consequence of failure for the assets within this asset category. See Appendix C for the criteria used to determine the risk rating of each asset.



Critical Assets

The identification of critical assets allows the Township to determine appropriate risk mitigation strategies and treatment options. These may include asset-specific lifecycle strategies, condition assessment strategies, or simply the need to collect better asset data. Critical assets do not necessarily require immediate renewal or replacement.

The following table identifies critical assets according to the risk criteria identified in Appendix C. The risk rating is calculated by multiplying the probability of failure and the consequence of failure for each asset.

Segment	Name	Risk Rating
Paved Roads	820 - East St N of Tracks (Fr Null To 325 Road)	19.2
Paved Roads	822 - Fox Point Rd (Fr Pine St to Dead-end)	17.76
Paved Roads	848 - Superior St (Fr Ontario St to Dead-end)	17.76
Paved Roads	923 - Humphery Rd (Fr Evergreens St to Poplar Dr)	17.76
Paved Roads	924 - Humphrey Rd (Fr Ash St to Evergreens St)	17.76
Paved Roads	814 - Cedar St W (Fr Cedar St to Dead-end)	14.8
Paved Roads	827 - James St (Fr Garden St to Hwy 17)	14.8
Paved Roads	838 - Pine St S Davy inter (Fr Boon St to Tapsay St)	14.8
Paved Roads	852 - West St N (Fr Hwy17 to Lake Shore Dr)	14.8
Paved Roads	853 - West St S (Fr Hwy 17 To Lake Shore Dr)	14.8

4.1.6 Levels of Service

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

Community Levels of Service

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

Service Attribute	Qualitative Description	Current LOS (2019)
Scope	Description, which may include maps, of the road network in the municipality and its level of connectivity	See Appendix B
Quality	Description or images that illustrate the different levels of road class pavement condition	The following condition rating criteria describes the different levels of road class pavement condition: **Very Good:** Pavement is in excellent condition with few visible defects. Ride ability is excellent with few areas of very slight distortion. **Good:** Pavement is in good condition with accumulating slight defects. Ride ability is good with intermittent slightly rough and uneven sections. **Fair:** Pavement is in fair condition with intermittent patterns of slight to moderate defects. Ride ability is fair, and surface is slightly rough and uneven. **Poor:** Pavement is in poor condition with frequent patterns of moderate defects. Ride ability is poor, and surface is rough and uneven. **Very Poor:** Pavement is in very poor condition with extensive severe defects. Ride ability is very poor, and surface is very rough and uneven.

Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2019)
Scope	Lane-km of arterial roads (MMS classes 1 and 2) per land area (km/km^2)	0
	Lane-km of collector roads (MMS classes 3 and 4) per land area (km/km^2)	0[1]
	Lane-km of local roads (MMS classes 5 and 6) per land area (km/km^2)	0.68
Quality	Average pavement condition index for paved roads in the municipality	44 - Fair
	Average surface condition for unpaved roads in the municipality (e.g. excellent, good, fair, poor)	Fair
Performance	Capital reinvestment rate	0.47%

[1] There is insufficient data to determine the current road classification for all municipal roads. It's expected that most roads would fall under MMS class 5 and 6 although some may be class 4 roads.

4.1.7 Recommendations

Asset Inventory

- Review asset segments with pooled asset inventories (Culverts, Sidewalks, Signs, Streetlights) and consider unpooling to assist with more detailed planning and analysis.
- Priority: Culverts & Sidewalks

Condition Assessment Strategies

- Determine a regular condition assessment cycle for paved roads, building on the recent assessment process completed in summer 2019 and expanding to other asset types as determined beneficial.

Lifecycle Management Strategies

- Implement a proactive rehabilitation strategy for paved roads to realize cost avoidance and maintain a high quality of road pavement condition.
- Increased capital costs are expected for paved roads over the next 5-10 years due to their condition and age. Staff will need to identify a phased road reconstruction strategy to minimize project costs and impact on the transportation network.

Risk Management Strategies

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

Levels of Service

- Continue to measure current levels of service to determine the impact of lifecycle management and funding strategies on network performance.
- Work towards identifying proposed levels of service as per O. Reg. 588/17 and identify the strategies that are required to close any gaps between current and proposed levels of service.

4.2 Storm Sewer Network

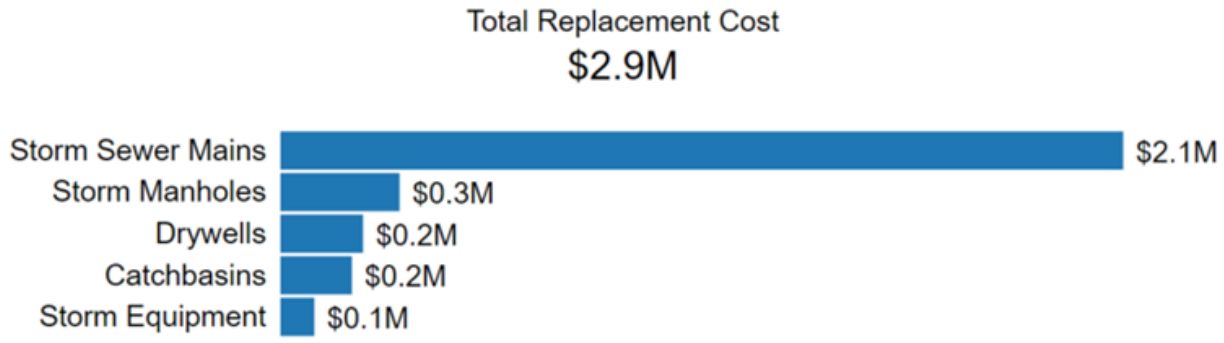
The Township is responsible for owning and maintaining a Storm Sewer Network consisting of 3.2 kilometres of storm sewer mains, catch basins, manholes, drywells, and other supporting infrastructure.

The Storm Sewer Network is maintained throughout the year by the Public Works Department.

4.2.1 Asset Inventory & Replacement Cost

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

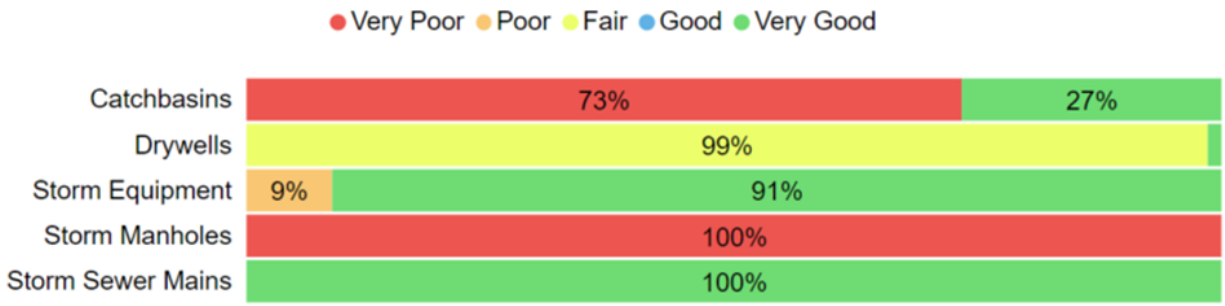
Asset Segment	Quantity	Replacement Cost Method	Total Replacement Cost
Catchbasins	45	Cost/Unit	$180,000
Drywells	208	Cost/Unit	$208,000
Storm Equipment	2	CPI Tables	$85,416
Storm Manholes	20	Cost/Unit	$300,000
Storm Sewer Mains	3,196 m	Cost/Unit	$2,121,445
			$2,894,861



4.2.2 Asset Condition

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

Asset Segment	Average Condition (%)	Average Condition Rating	Condition Source
Catchbasins	32%	Poor	Age-based Condition
Drywells	45%	Fair	Age-based Condition
Storm Equipment	79%	Good	Age-based Condition
Storm Manholes	11%	Very Poor	Age-based Condition
Storm Sewer Mains	85%	Very Good	Age-based Condition
	71%	**Good**	**100% Age-based Condition**



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

Current Approach to Condition Assessment

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

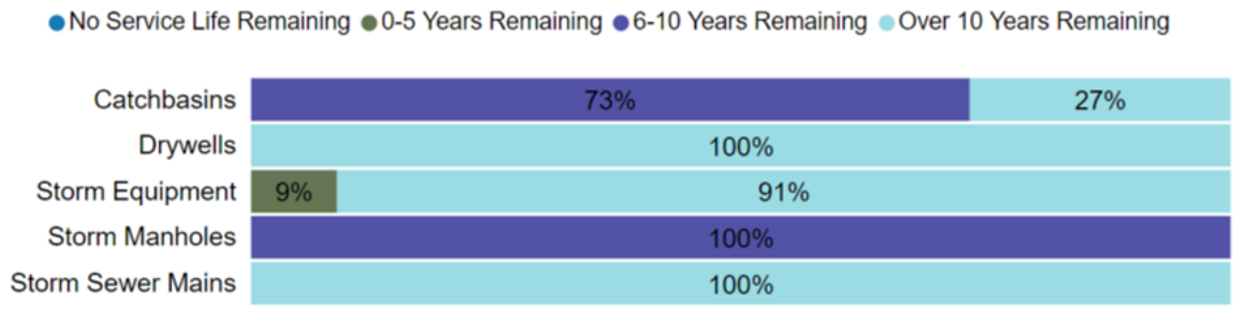
- There is currently no formal condition assessment framework in place for storm assets. In 2013, staff note that needs were documented, and sewers were cleaned out, but nothing more was recorded at that time.
- Over the last five years, staff have undertaken a yearly cleaning/flushing program to ensure that sewer assets are functioning properly. Catch basins and drywells are cleaned out annually as well.

4.2.3 Estimated Useful Life & Average Age

The Estimated Useful Life for Storm Sewer Network assets has been assigned according to a combination of established industry standards and staff knowledge. The Average Age of each asset is based on the number of years each asset has been in-service.

Finally, the Average Service Life Remaining represents the difference between the Estimated Useful Life and the Average Age, except when an asset has been assigned an assessed condition rating. Assessed condition may increase or decrease the average service life remaining.

Asset Segment	Estimated Useful Life (Years)	Average Age (Years)	Average Service Life Remaining (Years)
Catchbasins	50 Years	34.2	15.8
Drywells	50 Years	27.3	22.6
Storm Equipment	7-50 Years	6.5	22.0
Storm Manholes	50 Years	44.5	5.5
Storm Sewer Mains	75 Years	40.6	34.4
		32.1	**22.0**



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

4.2.4 Lifecycle Management Strategy

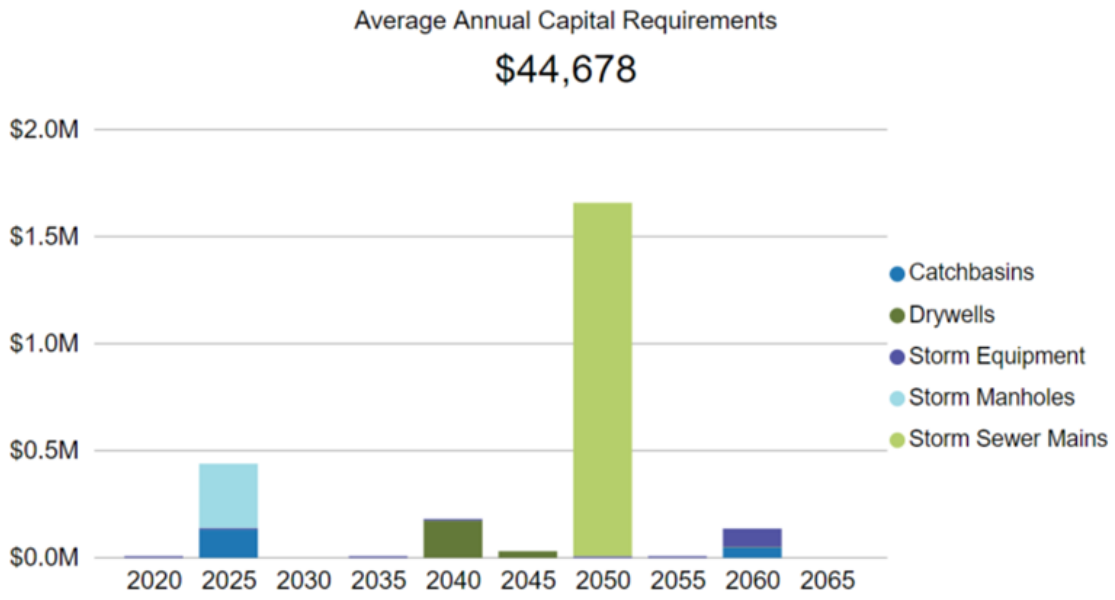
The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

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

Activity Type	Description of Current Strategy
Maintenance	Storm mains are cleaned and flushed annually to maintain flowrate and clear obstructions
	Catch basins are vacuumed annually to remove debris
Rehabilitaton/ Replacement	No major rehabilitation or replacement strategies apart from end-of-life replacement

Forecasted Capital Requirements

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



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

4.2.5 Risk & Criticality

The following risk matrix provides a visual representation of the relationship between the probability of failure and the consequence of failure for the assets within this asset category. See Appendix C for the criteria used to determine the risk rating of each asset.

Critical Assets

The identification of critical assets allows the Township to determine appropriate risk mitigation strategies and treatment options. These may include asset-specific lifecycle strategies, condition assessment strategies, or simply the need to collect better asset data. Critical assets do not necessarily require immediate renewal or replacement.

The following table identifies critical assets according to the risk criteria identified in Appendix C. The risk rating is calculated by multiplying the probability of failure and the consequence of failure for each asset.

Segment	Name	Risk Rating
Storm Equipment	36 - Storm Water Pump - Balsam Street	12
Storm Manholes	2724 - Storm Sewer - Agimac Creek	9.5
Storm Manholes	2725 - Storm Sewer - Agimac Creek	9.5
Storm Manholes	2726 - Storm Sewer - Agimac Creek	9.5
Storm Manholes	2727 - Storm Sewer - Agimac Creek	9.5
Storm Manholes	2728 - Storm Sewer - Agimac Creek	9.5
Storm Manholes	2729 - Storm Sewer - Agimac Creek	9.5
Storm Manholes	2730 - Storm Sewer - Agimac Creek	9.5
Storm Manholes	2736 - Storm Sewer-Pine St.-N. Tracks	9.5
Storm Manholes	2763 - Storm Sewers - Garden To Pine	9.5

4.2.6 Levels of Service

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

Community Levels of Service

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

Service Attribute	Qualitative Description	Current LOS (2019)
Scope	Description, which may include map, of the user groups or areas of the municipality that are protected from flooding, including the extent of protection provided by the municipal stormwater system	See Appendix B

Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2019)
Scope	% of properties in municipality resilient to a 100-year storm	TBD[2]
	% of the municipal stormwater management system resilient to a 5-year storm	TBD
Performance	Capital reinvestment rate	0.21

[22] The Municipality does not have data to confidently determine the % of properties resilient to a 100-year storm or the % of the municipal stormwater management system resilient to a 5-year storm

4.2.7 Recommendations

Condition Assessment Strategies

- This AMP relies entirely on age-based estimates of asset condition. The Township should develop a formal condition assessment strategy which may include the use of CCTV cameras to inspect storm sewer mains.

Lifecycle Management Strategies

- The majority of storm sewers were built in the 1970s and capital needs have been fairly minimal to date. Within 20-30 years a significant portion of the storm sewer network is expected to reach the end of its lifecycle and require rehabilitation or replacement. While short-term capital project costs may be minimal, Township staff should start planning for future requirements to ensure that adequate reserves are available when those needs become realized.

Levels of Service

- Continue to measure current levels of service to determine the impact of lifecycle management and funding strategies on network performance.
- Work towards identifying proposed levels of service as per O. Reg. 588/17 and identify the strategies that are required to close any gaps between current and proposed levels of service.

4.3 Buildings & Facilities

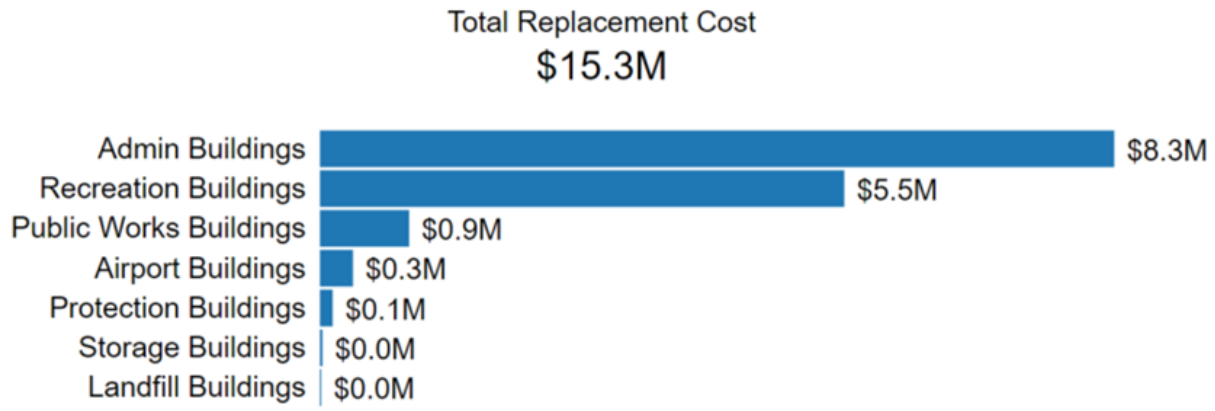
The Township of Ignace owns and maintains several facilities and recreation centres that provide key services to the community. These include:

- administrative offices
- an airport
- fire stations and associated offices and facilities
- solid waste disposal facilities
- public works garages and storage sheds
- arenas and community centres

4.3.1 Asset Inventory & Replacement Cost

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

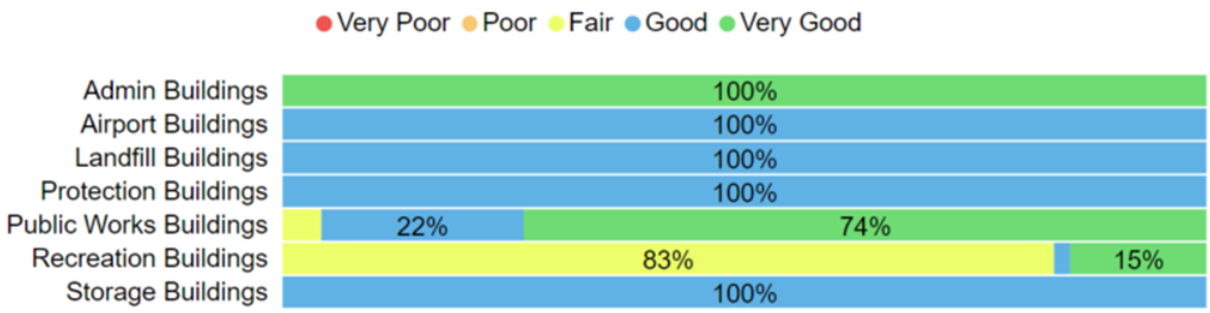
Asset Segment	Quantity	Replacement Cost Method	Total Replacement Cost
Admin Buildings	3	CPI Tables	$8,345,110
Airport Buildings	1	CPI Tables	$349,856
Landfill Buildings	1	CPI Tables	$2,764
Protection Buildings	1	CPI Tables	$136,273
Public Works Buildings	5	CPI Tables	$939,704
Recreation Buildings	5	CPI Tables	$5,509,750
Storage Buildings	2	CPI Tables	$29,008
			$15,312,465



4.3.2 Asset Condition

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

Asset Segment	Average Condition (%)	Average Condition Rating	Condition Source
Admin Buildings	85%	Very Good	Assessed Condition
Airport Buildings	70%	Good	Assessed Condition
Landfill Buildings	70%	Good	Assessed Condition
Protection Buildings	70%	Good	Assessed Condition
Public Works Buildings	79%	Good	Assessed Condition
Recreation Buildings	43%	Fair	Assessed Condition
Storage Buildings	70%	Good	Assessed Condition
	69%	**Good**	**100% Assessed Condition**



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

Current Approach to Condition Assessment

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

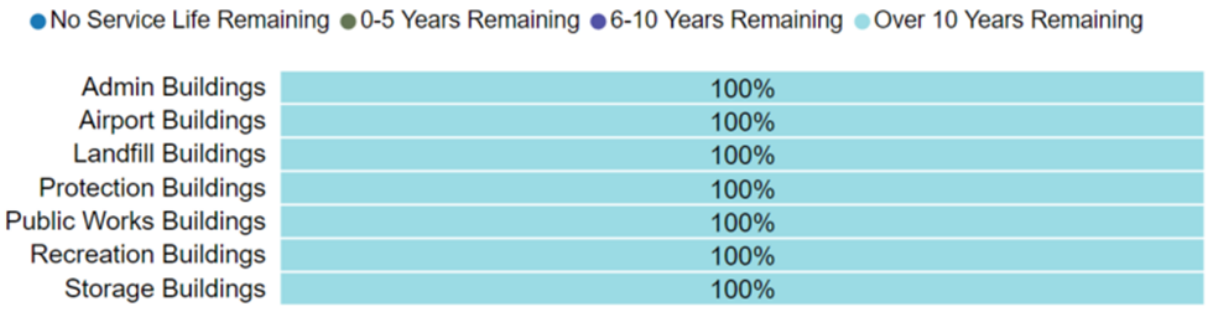
- While no formal condition assessment strategies are in place, the Township collected provided a cursory condition rating (Very Poor, Poor, Fair, Good, Very Good) for all buildings to inform this AMP
- All buildings are regularly inspected to ensure that they meet health & safety requirements

4.3.3 Estimated Useful Life & Average Age

The Estimated Useful Life for Buildings & Facilities assets has been assigned according to a combination of established industry standards and staff knowledge. The Average Age of each asset is based on the number of years each asset has been in-service.

Finally, the Average Service Life Remaining represents the difference between the Estimated Useful Life and the Average Age, except when an asset has been assigned an assessed condition rating. Assessed condition may increase or decrease the average service life remaining.

Asset Segment	Estimated Useful Life (Years)	Average Age (Years)	Average Service Life Remaining (Years)
Admin Buildings	50 Years	24.2	43.8
Airport Buildings	50 Years	34.5	34.8
Landfill Buildings	50 Years	39.5	34.8
Protection Buildings	50 Years	52.5	34.8
Public Works Buildings	50 Years	36.9	35.8
Recreation Buildings	50 Years	28.1	25.8
Storage Buildings	50 Years	39.5	34.8
		33.5	**34.1**



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

4.3.4 Lifecycle Management Strategy

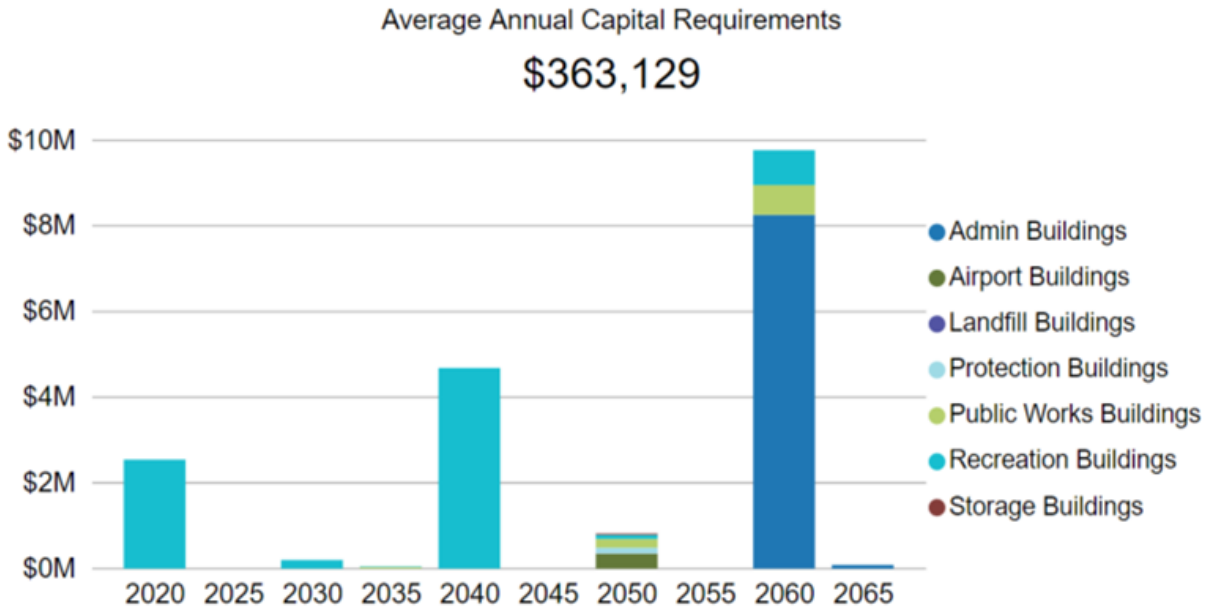
The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

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

Activity Type	Description of Current Strategy
Maintenance	Health & safety inspections are completed regularly, these inspections do not include an assessment of current asset condition
	Facility cleaning is contracted out and completed on a regular basis
Rehabilitation/ Replacement	Many buildings are beginning to reach the end of their useful life and replacement will be required
	With limited budget available for building replacement, a proactive rehabilitation strategy will need to be developed to maximize the impact of available funding

Forecasted Capital Requirements

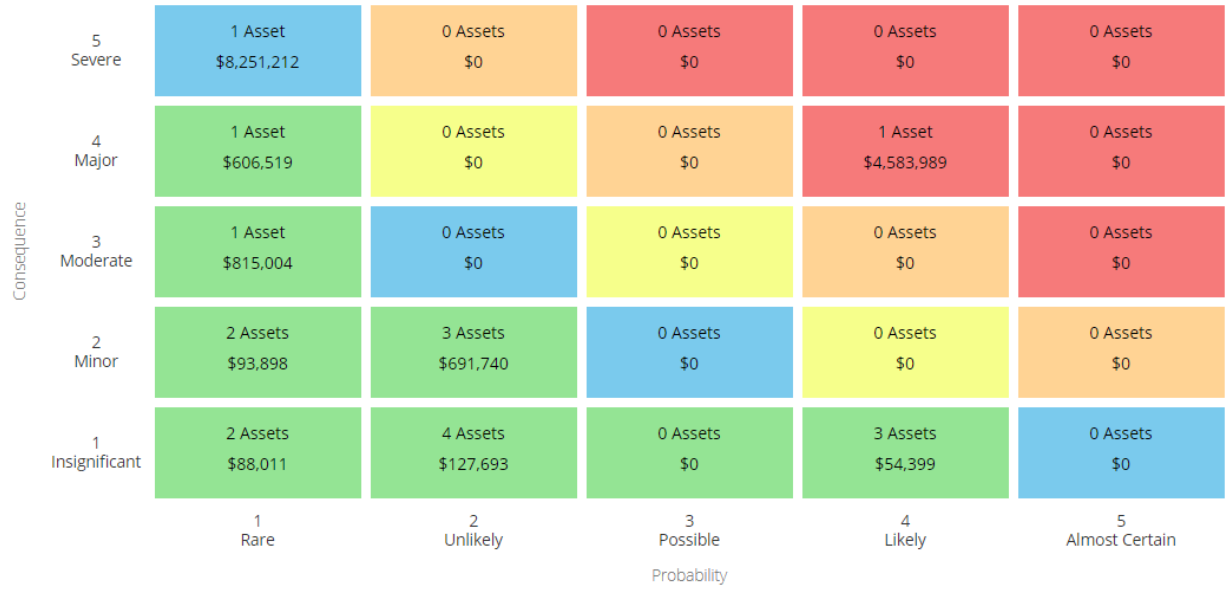
The following graph forecasts long-term capital requirements. The annual capital requirement represents the average amount per year that the Township should allocate towards funding rehabilitation and replacement needs.



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

4.3.5 Risk & Criticality

The following risk matrix provides a visual representation of the relationship between the probability of failure and the consequence of failure for the assets within this asset category. See Appendix C for the criteria used to determine the risk rating of each asset.



Critical Assets

The identification of critical assets allows the Township to determine appropriate risk mitigation strategies and treatment options. These may include asset-specific lifecycle strategies, condition assessment strategies, or simply the need to collect better asset data. Critical assets do not necessarily require immediate renewal or replacement.

The following table identifies critical assets according to the risk criteria identified in Appendix C. The risk rating is calculated by multiplying the probability of failure and the consequence of failure for each asset.

Segment	Name	Risk Rating
Recreation Buildings	9 - B102 - Recreation Centre	17.6
Public Works Buildings	13 - B106 - Storage Shed No. 1 P.W.	7.6
Recreation Buildings	15 - B108 - Beach House	6.4
Recreation Buildings	16 - B109 - Bath Change House	6.4
Protection Buildings	10 - B103 - Fire Hall	5.2
Public Works Buildings	12 - B105 - Public Works Garage	5.2
Admin Buildings	7 - B101 - Township Office	5
Airport Buildings	6 - B100 - Municipal Airport	4.8
Public Works Buildings	18 - B111 - Crossroads Facility	4
Recreation Buildings	23 - B134 - World Hub - Golf Course	3.7

4.3.6 Levels of Service

Buildings & Facilities is considered a non-core asset category. As such, the Township has until July 1, 2023 to determine the qualitative descriptions and technical metrics that measure the current level of service provided.

4.3.7 Recommendations

Asset Inventory

- The Township's asset inventory contains a single record for all facilities. Facilities consist of several major components that have unique useful lives and require asset-specific lifecycle strategies. Staff should work towards a component-based inventory of all facilities to allow for component-based lifecycle planning.

Condition Assessment Strategies

- Township staff completed a cursory review of facility condition to inform the development of this AMP. The Township should implement regular condition assessment procedures for all facilities to better inform short- and long-term capital requirements.
- Detailed component-based facility assessments should be considered for structures that exhibit moderate to severe signs of deterioration.

Lifecycle Management Strategies

- While most municipal facilities are expected to remain in-service beyond the next 20 years, the reliability of lifecycle costs in this AMP is limited due to the lack of a component-based facilities inventory. It is expected that major facility components will require rehabilitation or replacement throughout the lifecycle of each structure. Detailed facility assessments are required to determine the true extent of lifecycle requirements.

Levels of Service

- Township staff need to identify the qualitative descriptions and technical metrics that will measure the current level of service provided by facilities by July 1, 2023 according to O. Reg. 588/17.

4.4 Machinery & Equipment

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

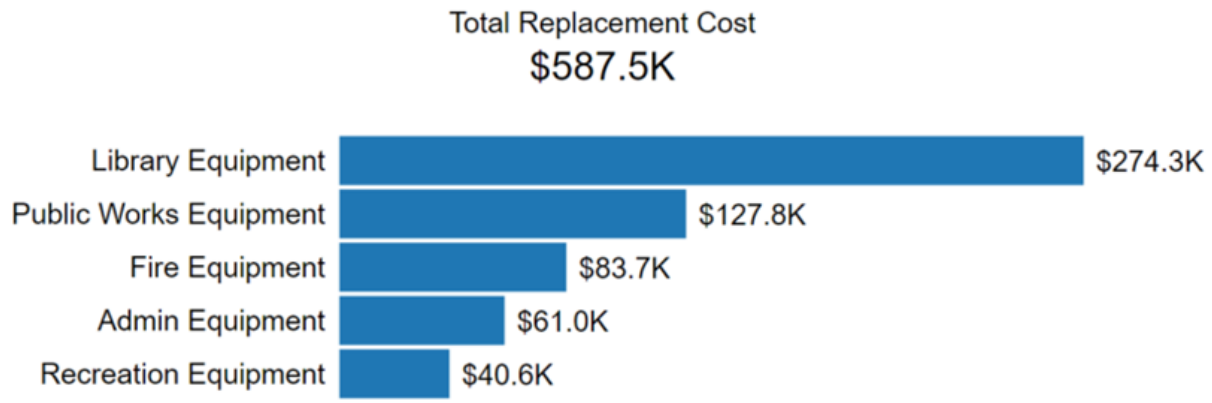
- Administrative equipment including computers, servers and software
- Fire equipment to support the delivery of emergency services
- Library books for public loan, and more

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

4.4.1 Asset Inventory & Replacement Cost

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

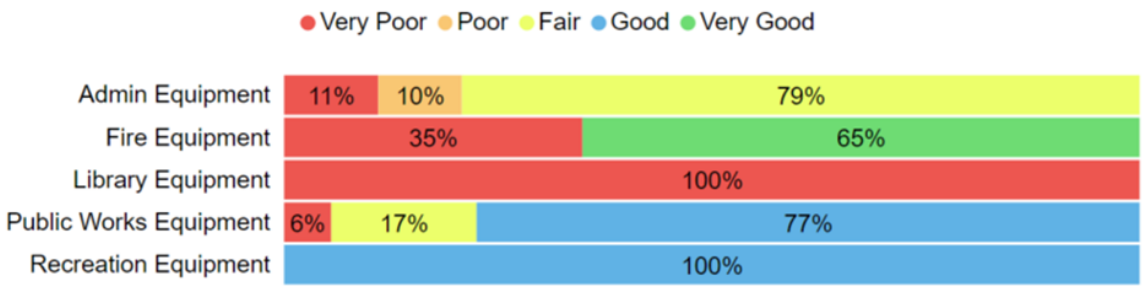
Asset Segment	Quantity	Replacement Cost Method	Total Replacement Cost
Admin Equipment	3	CPI Tables	$60,959
Fire Equipment	4	CPI Tables	$83,722
Library Equipment	1	CPI Tables	$274,338
Public Works Equipment	4	CPI Tables	$127,843
Recreation Equipment	1	CPI Tables	$40,635
			$587,497



4.4.2 Asset Condition

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

Asset Segment	Average Condition (%)	Average Condition Rating	Condition Source
Admin Equipment	45%	Fair	Age-based Condition
Fire Equipment	62%	Good	Age-based Condition
Library Equipment	0%	Very Poor	Age-based Condition
Public Works Equipment	67%	Good	Age-based Condition
Recreation Equipment	78%	Good	Age-based Condition
			100% Age-based Condition



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

Current Approach to Condition Assessment

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

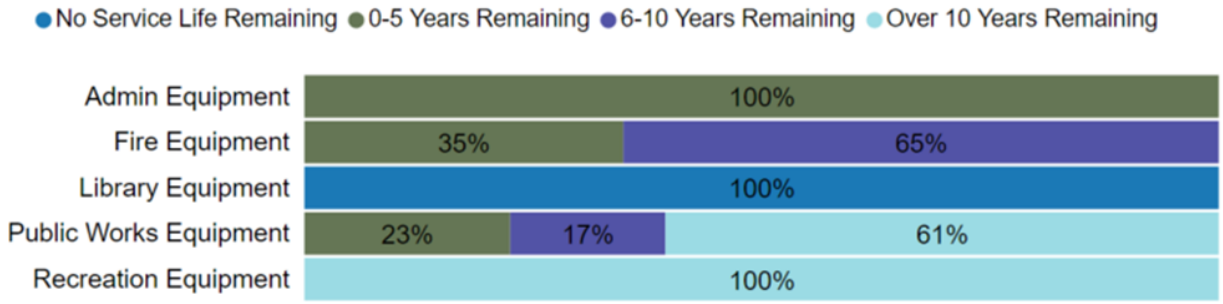
- Staff complete regular visual inspections of machinery & equipment to ensure they are in state of adequate repair
- There are no formal condition assessment programs in place at this time

4.4.3 Estimated Useful Life & Average Age

The Estimated Useful Life for Machinery & Equipment assets has been assigned according to a combination of established industry standards and staff knowledge. The Average Age of each asset is based on the number of years each asset has been in-service.

Finally, the Average Service Life Remaining represents the difference between the Estimated Useful Life and the Average Age, except when an asset has been assigned an assessed condition rating. Assessed condition may increase or decrease the average service life remaining.

Asset Segment	Estimated Useful Life (Years)	Average Age (Years)	Average Service Life Remaining (Years)
Admin Equipment	5 Years	3.5	1.5
Fire Equipment	10 Years	3.0	7.0
Library Equipment	20 Years	20.5	-0.5
Public Works Equipment	10-25 Years	5.7	8.1
Recreation Equipment	20 Years	4.5	15.5
		5.4	**6.2**



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

4.4.4 Lifecycle Management Strategy

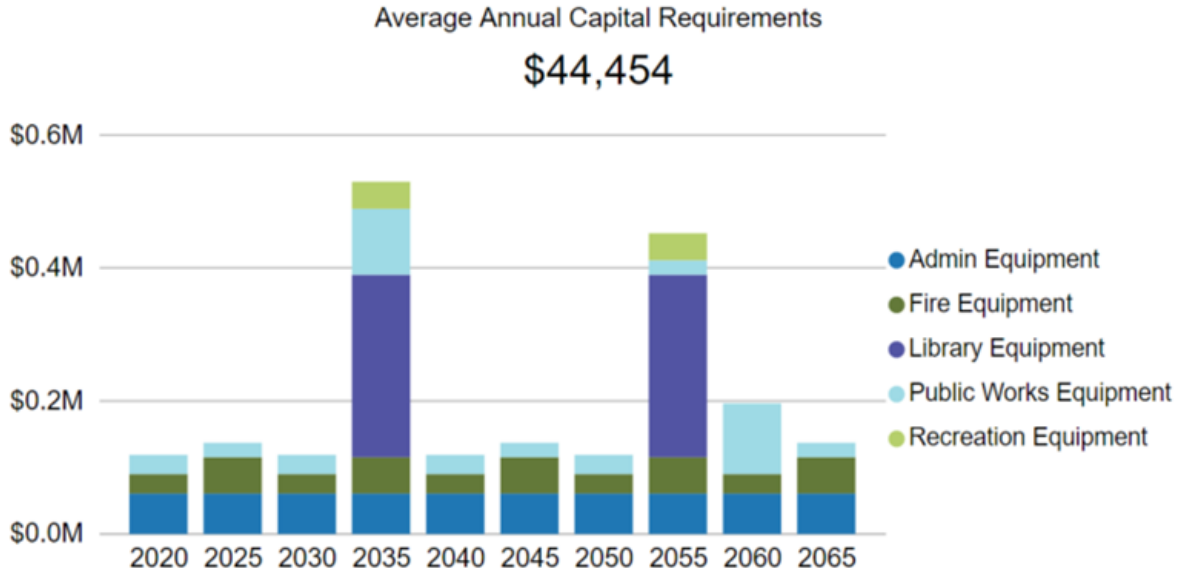
The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

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

Activity Type	Description of Current Strategy
Maintenance/ Rehabilitation	Maintenance is completed on an as-needed basis according to requirements identified by staff and/or equipment operators
Replacement	Replacement occurs when assets reach the end of their expected useful life

Forecasted Capital Requirements

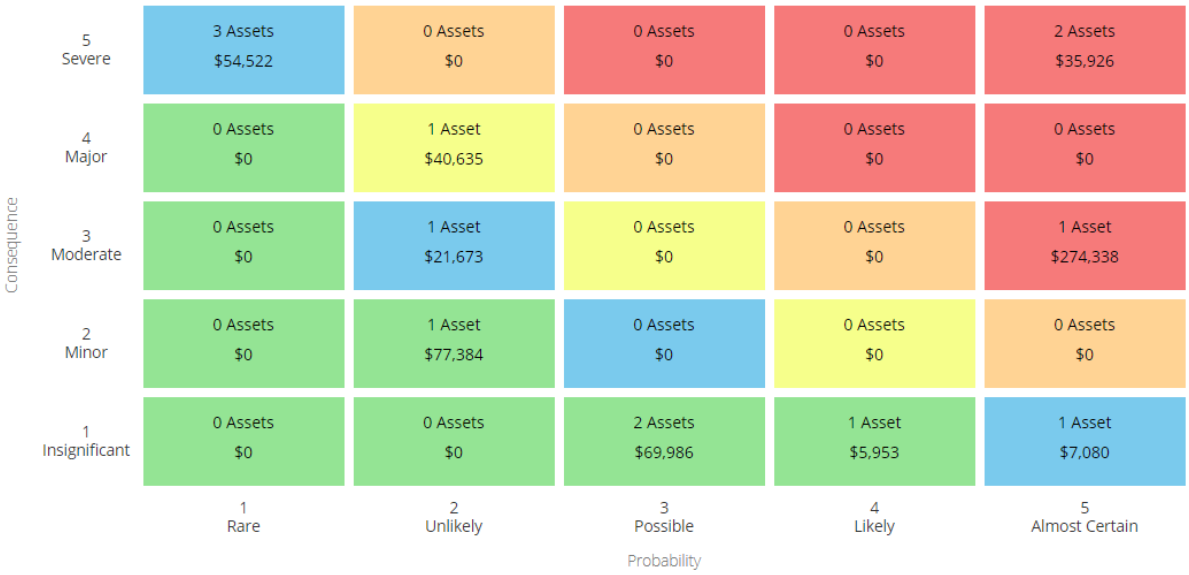
The following graph forecasts long-term capital requirements. The annual capital requirement represents the average amount per year that the Township should allocate towards funding rehabilitation and replacement needs.



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

4.4.5 Risk & Criticality

The following risk matrix provides a visual representation of the relationship between the probability of failure and the consequence of failure for the assets within this asset category. See Appendix C for the criteria used to determine the risk rating of each asset.



Critical Assets

The identification of critical assets allows the Township to determine appropriate risk mitigation strategies and treatment options. These may include asset-specific lifecycle strategies, condition assessment strategies, or simply the need to collect better asset data. Critical assets do not necessarily require immediate renewal or replacement.

The following table identifies critical assets according to the risk criteria identified in Appendix C. The risk rating is calculated by multiplying the probability of failure and the consequence of failure for each asset.

Segment	Name	Risk Rating
Admin Equipment	32 – Computer Network Server	25
Fire Equipment	31 – Jaws of Life	25
Library Equipment	353 – Library Book Collection	15
Recreation Equipment	37 – Wheel Chair Lift	8

4.4.6 Levels of Service

Machinery & Equipment is considered a non-core asset category. As such, the Township has until July 1, 2023 to determine the qualitative descriptions and technical metrics that measure the current level of service provided.

4.4.7 Recommendations

Replacement Costs

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

Condition Assessment Strategies

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

Levels of Service

- Township staff need to identify the qualitative descriptions and technical metrics that will measure the current level of service provided by equipment by July 1, 2023 according to O. Reg. 588/17.

4.5 Fleet

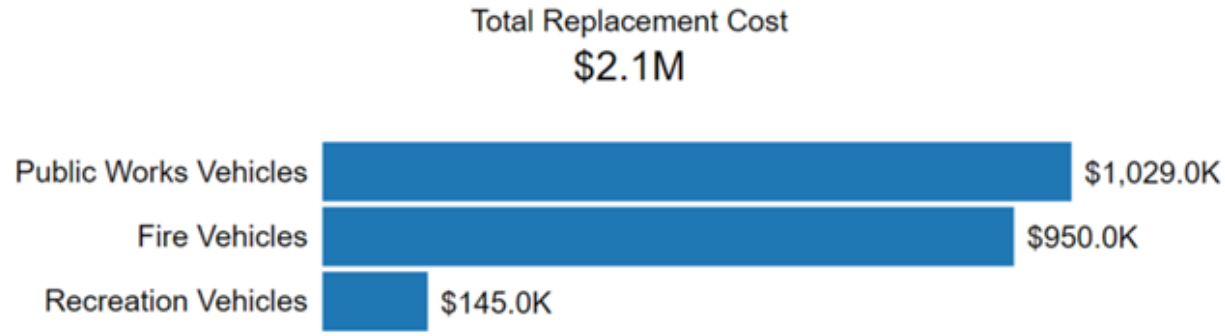
Fleet allow staff to efficiently deliver municipal services and personnel. Municipal Fleet are used to support several service areas, including:

- fire rescue pumper trucks to provide emergency services
- trucks, vans, mowers and backhoes to assist with maintenance and operating activities
- zambonis and other vehicles that provide recreation services

4.5.1 Asset Inventory & Replacement Cost

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

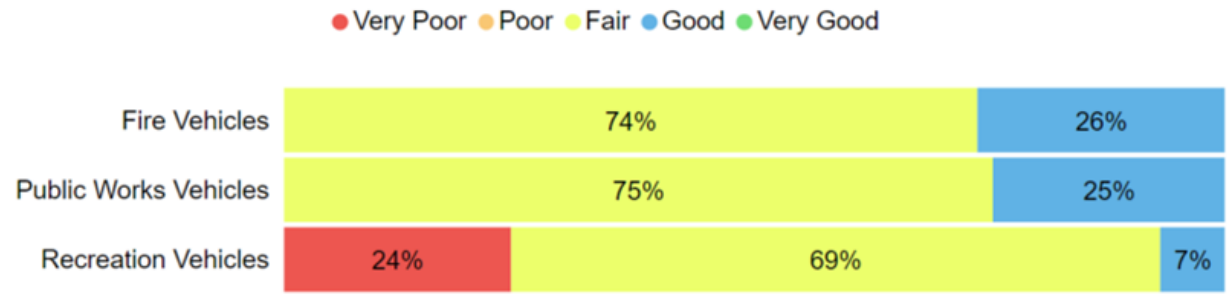
Asset Segment	Quantity	Replacement Cost Method	Total Replacement Cost
Fire Vehicles	3	User-Defined Cost	$950,000
Public Works Vehicles	12	User-Defined Cost	$1,029,000
Recreation Vehicles	3	User-Defined Cost	$145,000
			$2,124,000



4.5.2 Asset Condition

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

Asset Segment	Average Condition (%)	Average Condition Rating	Condition Source
Fire Vehicles	54%	Fair	Assessed Condition
Public Works Vehicles	54%	Fair	Assessed Condition
Recreation Vehicles	39%	Poor	Assessed Condition
	53%	**Fair**	**100% Assessed Condition**



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

Current Approach to Condition Assessment

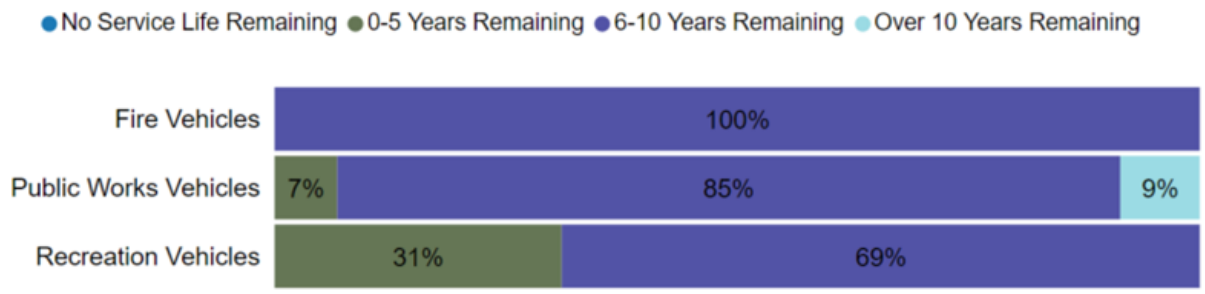
Accurate and reliable condition data allows staff to more confidently determine the remaining service life of assets and identify the most cost-effective approach to managing assets. The following describes the municipality's current approach:

- Staff complete regular visual inspections of Fleet to ensure they are in state of adequate repair prior to operation
- While no formal condition assessment strategies are in place, the Township collected provided a cursory condition rating (Very Poor, Poor, Fair, Good, Very Good) for all vehicles to inform this AMP

4.5.3 Estimated Useful Life & Average Age

The Estimated Useful Life for Fleet assets has been assigned according to a combination of established industry standards and staff knowledge. The Average Age of each asset is based on the number of years each asset has been in-service. Finally, the Average Service Life Remaining represents the difference between the Estimated Useful Life and the Average Age, except when an asset has been assigned an assessed condition rating. Assessed condition may increase or decrease the average service life remaining.

Asset Segment	Estimated Useful Life (Years)	Average Age (Years)	Average Service Life Remaining (Years)
Fire Vehicles	12 Years	16.2	6.6
Public Works Vehicles	8-15 Years	11.3	7.2
Recreation Vehicles	7-15 Years	14.2	4.3
		12.6	**6.6**



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

4.5.4 Lifecycle Management Strategy

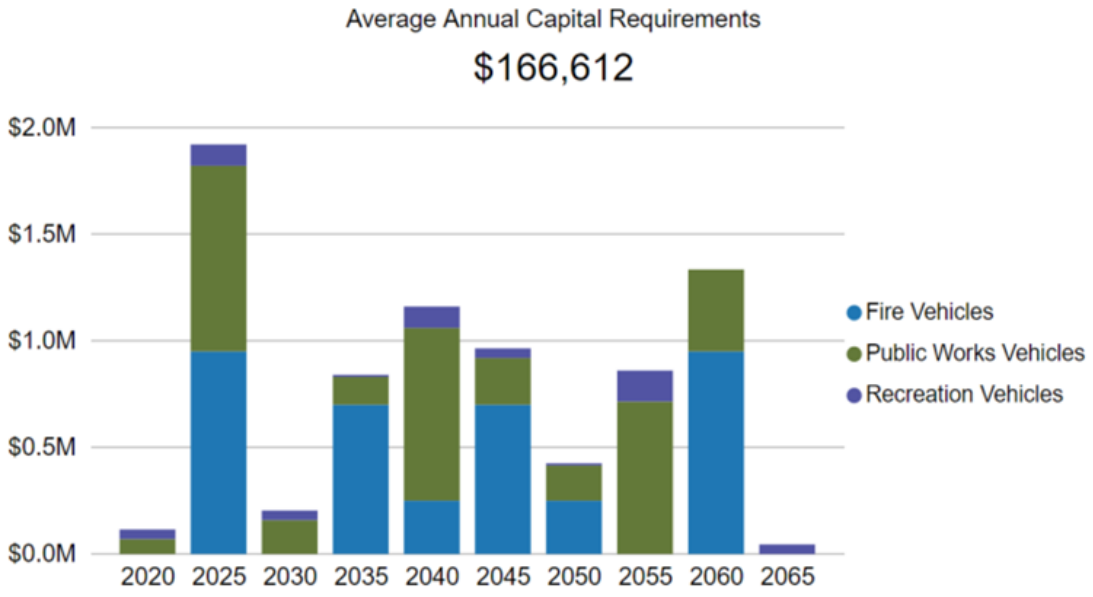
The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

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

Activity Type	Description of Current Strategy
Maintenance/ Rehabilitation	Maintenance is completed on an as-needed basis according to requirements identified by vehicle operators
	Regular maintenance and upkeep is performed according to the vehicle manufacturer's suggestions
Replacement	Vehicle replacement is prioritized based on the condition of vehicles and the criticality of the services they provide
	To plan for the future replacement of vehicles the Township has been putting money aside with the hopes to have funds for the full cost of a replacement vehicle available when needed

Forecasted Capital Requirements

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



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

4.5.5 Risk & Criticality

The following risk matrix provides a visual representation of the relationship between the probability of failure and the consequence of failure for the assets within this asset category. See Appendix C for the criteria used to determine the risk rating of each asset.

Critical Assets

The identification of critical assets allows the Township to determine appropriate risk mitigation strategies and treatment options. These may include asset-specific lifecycle strategies, condition assessment strategies, or simply the need to collect better asset data. Critical assets do not necessarily require immediate renewal or replacement.

The following table identifies critical assets according to the risk criteria identified in Appendix C. The risk rating is calculated by multiplying the probability of failure and the consequence of failure for each asset.

Segment	Name	Risk Rating
Fire Vehicles	367 - FV04 - GMC PUMPER TRUCK 2004 STERLING	15
Fire Vehicles	368 - FVO3 - 1990 FORD PUMPER TRUCK #83	15
Public Works Vehicles	359 - PV11 - 1995 JOHN DEERE LOADER	15
Public Works Vehicles	358 - PV10 - 1995 JOHN DEERE BACKHOE	12
Public Works Vehicles	364 - PV16 - 2012 VOLVO GRADER	12
Recreation Vehicles	360 - ZAMBONI - 1999 ZAMBONI	12
Recreation Vehicles	370 - PV01 - 2009 FORD F150 4 X 4	10

4.5.6 Levels of Service

Fleet are considered a non-core asset category. As such, the Township has until July 1, 2023 to determine the qualitative descriptions and technical metrics that measure the current level of service provided.

4.5.7 Recommendations

Condition Assessment Strategies

- Township staff provided assessed condition data for all vehicles during the development of this AMP. Formal condition assessment procedures should be developed to ensure that asset management planning is based on the best available date regarding asset condition.

Levels of Service

- Township staff need to identify the qualitative descriptions and technical metrics that will measure the current level of service provided by vehicles by July 1, 2023 according to O. Reg. 588/17.

4.6 Land Improvements

The Township of Ignace owns a small number of assets that are considered Land Improvements. This category includes:

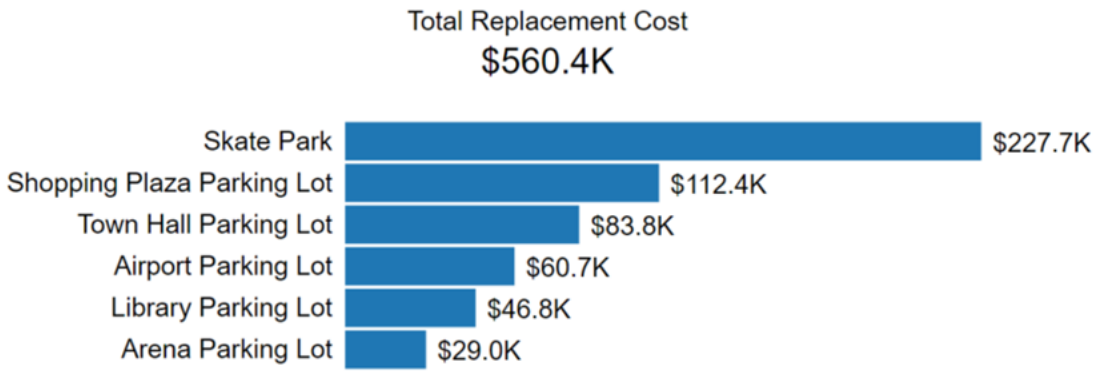
- parking lots for municipal facilities
- a skate park

There are additional land improvement assets that staff are in the process of cataloguing, including playground equipment and trails.

4.6.1 Asset Inventory & Replacement Cost

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

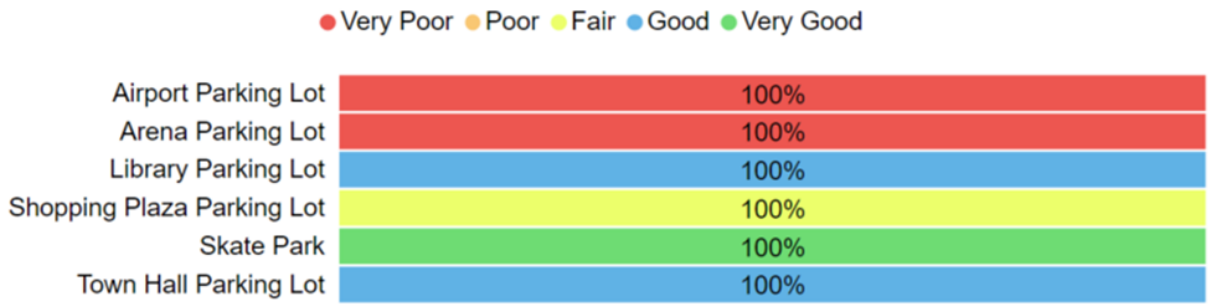
Asset Segment	Quantity	Replacement Cost Method	Total Replacement Cost
Airport Parking Lot	1	CPI Tables	$60,684
Arena Parking Lot	1	CPI Tables	$29,000
Library Parking Lot	1	CPI Tables	$46,761
Shopping Plaza Parking Lot	1	CPI Tables	$112,412
Skate Park	1	CPI Tables	$227,725
Town Hall Parking Lot	1	CPI Tables	$83,810
			$560,392



4.6.2 Asset Condition

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

Asset Segment	Average Condition (%)	Average Condition Rating	Condition Source
Airport Parking Lot	14%	Very Poor	Assessed Condition
Arena Parking Lot	14%	Very Poor	Assessed Condition
Library Parking Lot	69%	Good	Assessed Condition
Shopping Plaza Parking Lot	49%	Fair	Assessed Condition
Skate Park	88%	Very Good	Age-based Condition
Town Hall Parking Lot	69%	Good	Assessed Condition
	64%	**Good**	**59% Assessed Condition**



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

Current Approach to Condition Assessment

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

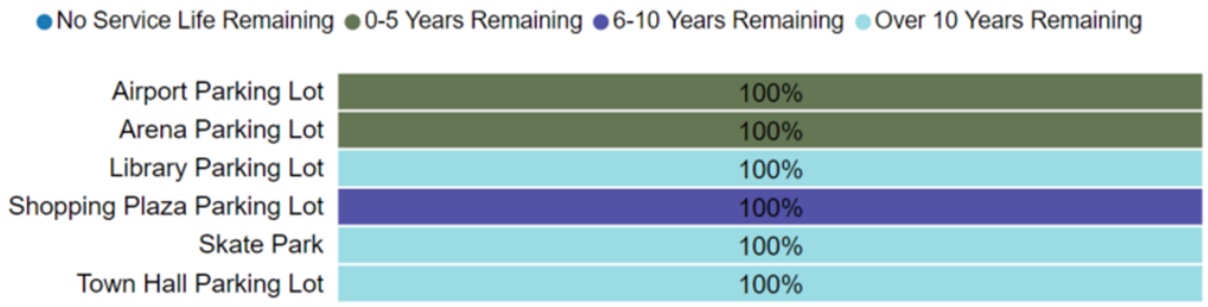
- While no formal condition assessment strategies are in place, the Township collected provided a cursory condition rating (Very Poor, Poor, Fair, Good, Very Good) for all parking lots to inform this AMP

4.6.3 Estimated Useful Life & Average Age

The Estimated Useful Life for Land Improvements assets has been assigned according to a combination of established industry standards and staff knowledge. The Average Age of each asset is based on the number of years each asset has been in-service.

Finally, the Average Service Life Remaining represents the difference between the Estimated Useful Life and the Average Age, except when an asset has been assigned an assessed condition rating. Assessed condition may increase or decrease the average service life remaining.

Asset Segment	Estimated Useful Life (Years)	Average Age (Years)	Average Service Life Remaining (Years)
Airport Parking Lot	20 Years	32.5	2.8
Arena Parking Lot	20 Years	44.5	2.8
Library Parking Lot	20 Years	27.5	13.8
Shopping Plaza Parking Lot	20 Years	42.5	9.8
Skate Park	20 Years	2.4	17.5
Town Hall Parking Lot	20 Years	29.5	13.8
		29.8	**10.1**



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

4.6.4 Lifecycle Management Strategy

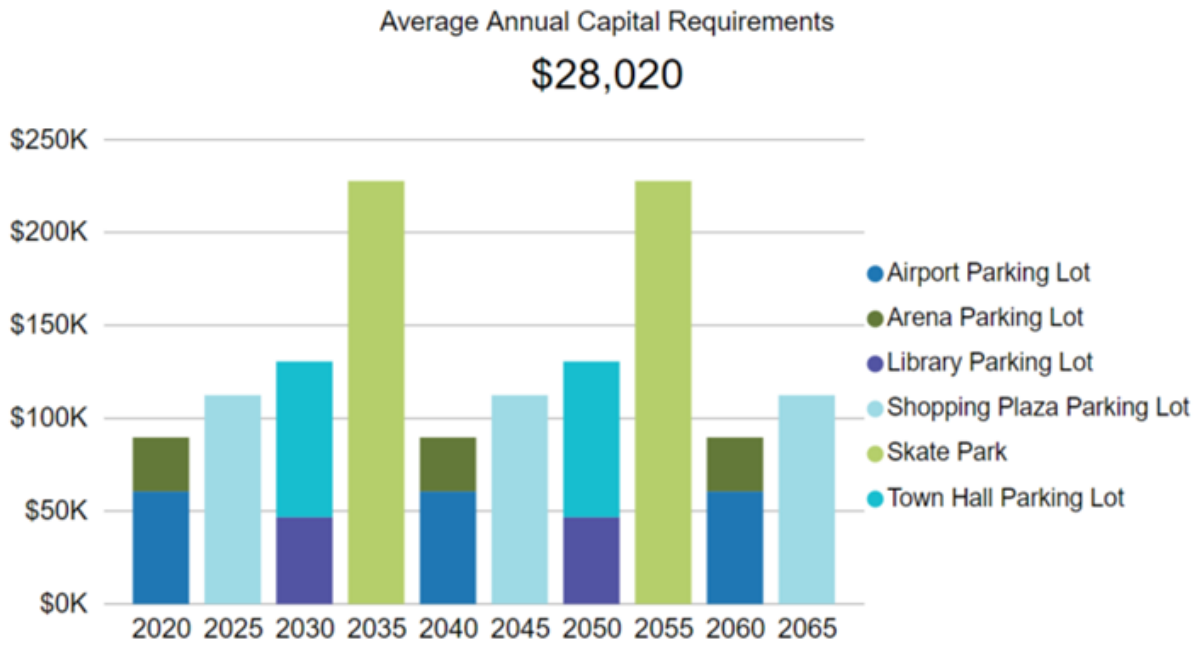
The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

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

Activity Type	Description of Current Strategy
Maintenance	Parking lots are maintained on an as-needed basis depending on identified pavement distresses and deficiencies

Forecasted Capital Requirements

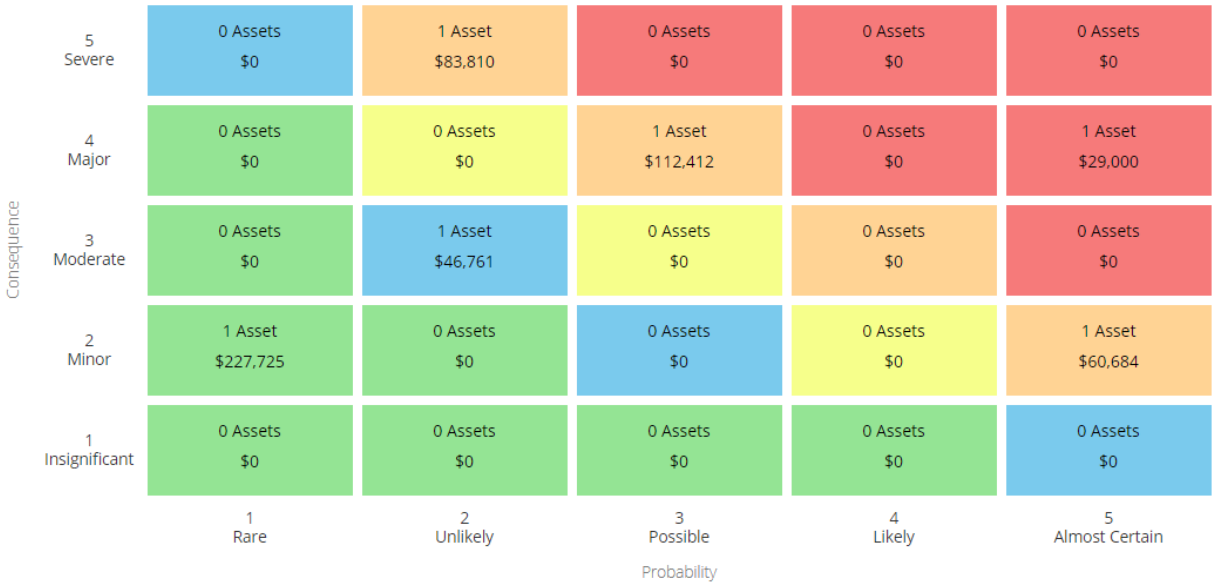
The following graph forecasts long-term capital requirements. The annual capital requirement represents the average amount per year that the Township should allocate towards funding rehabilitation and replacement needs.



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

4.6.5 Risk & Criticality

The following risk matrix provides a visual representation of the relationship between the probability of failure and the consequence of failure for the assets within this asset category. See Appendix C for the criteria used to determine the risk rating of each asset.



Critical Assets

The identification of critical assets allows the Township to determine appropriate risk mitigation strategies and treatment options. These may include asset-specific lifecycle strategies, condition assessment strategies, or simply the need to collect better asset data. Critical assets do not necessarily require immediate renewal or replacement.

The following table identifies critical assets according to the risk criteria identified in Appendix C. The risk rating is calculated by multiplying the probability of failure and the consequence of failure for each asset.

Segment	Name	Risk Rating
Arena Parking Lot	2 - Arena Parking Lot	20
Shopping Plaza Parking Lot	4 - Shopping Plaza Parking Lot	12
Airport Parking Lot	1 - Airport Parking Lot	10
Town Hall Parking Lot	5 - Town Hall Parking Lot	10

4.6.6 Levels of Service

Land Improvements are considered a non-core asset category. As such, the Township has until July 1, 2023 to determine the qualitative descriptions and technical metrics that measure the current level of service provided.

4.6.7 Recommendations

Asset Inventory

- Staff completed an assessment of parks infrastructure in 2019 and identified some assets that are not currently in the asset inventory. The data for these assets is still under review at the completion of this AMP and should be integrated into asset management planning once entered into the Township's asset inventory.

Levels of Service

- Township staff need to identify the qualitative descriptions and technical metrics that will measure the current level of service provided by land improvements by July 1, 2023 according to O. Reg. 588/17.

5 Analysis of Rate-funded Assets

Key Insights

- Rate-funded assets are valued at $49.7 million
- 93% of rate-funded assets are in fair or better condition
- The average annual capital requirement to sustain the current level of service for rate-funded assets is approximately $823,000
- Critical assets should be evaluated to determine appropriate risk mitigation activities and treatment options

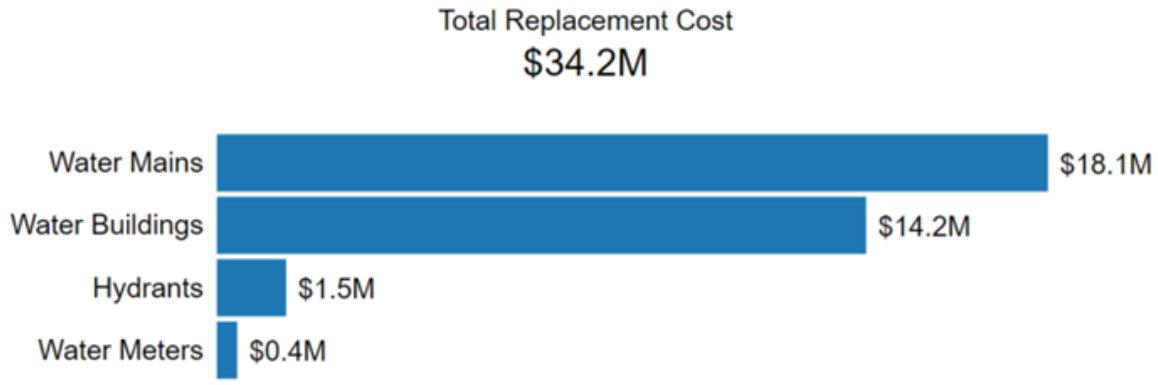
5.1 Water Network

The Township of Ignace has contracted Northern Waterworks Inc. to oversee the treatment and distribution of safe drinking water. They are responsible for ensuring the residents of Ignace are provided with safe drinking water.

5.1.1 Asset Inventory & Replacement Cost

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

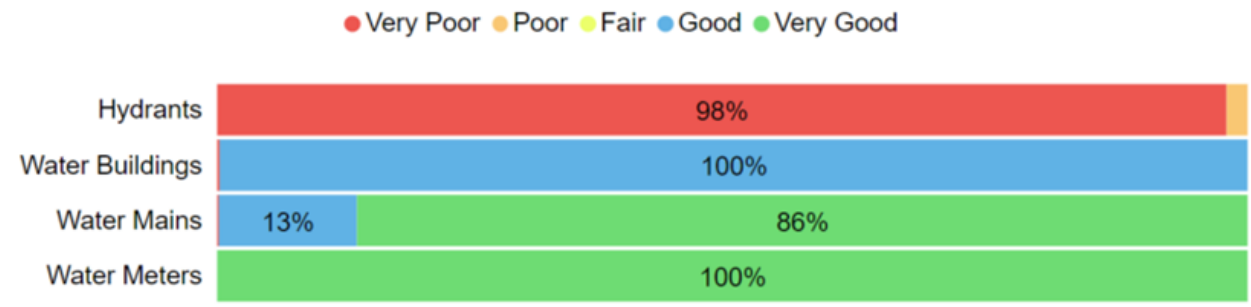
Asset Segment	Quantity	Replacement Cost Method	Total Replacement Cost
Hydrants	144	Cost/Unit	$1,512,000
Water Buildings	3	CPI Tables	$14,156,354
Water Mains	20,208 m	Cost/Unit	$18,118,881
Water Meters	N/A	CPI Tables	$446,469
			$34,233,704



5.1.2 Asset Condition

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

Asset Segment	Average Condition (%)	Average Condition Rating	Condition Source
Hydrants	1%	Very Poor	Age-based Condition
Water Buildings	79%	Good	Age-based Condition
Water Mains	89%	Very Good	Age-based Condition
Water Meters	94%	Very Good	Age-based Condition
	81%	**Very Good**	**100% Age-based Condition**



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

Current Approach to Condition Assessment

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

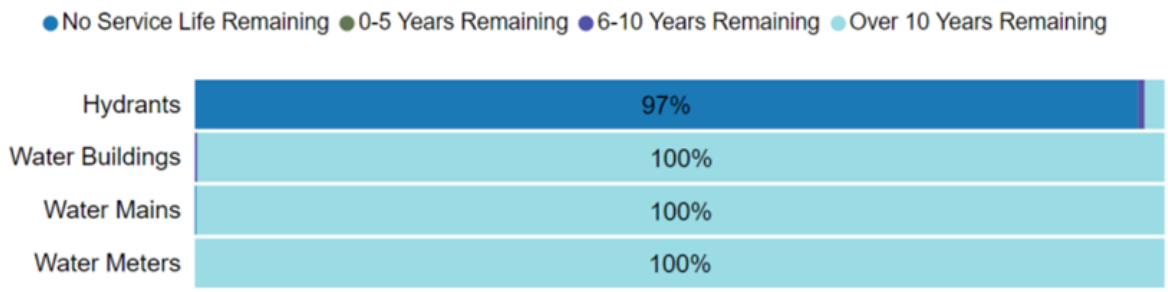
- Northern Waterworks is responsible for tracking the condition of the Water Network and identifying capital needs that the Township should consider

5.1.3 Estimated Useful Life & Average Age

The Estimated Useful Life for Water Network assets has been assigned according to a combination of established industry standards and staff knowledge. The Average Age of each asset is based on the number of years each asset has been in-service.

Finally, the Average Service Life Remaining represents the difference between the Estimated Useful Life and the Average Age, except when an asset has been assigned an assessed condition rating. Assessed condition may increase or decrease the average service life remaining.

Asset Segment	Estimated Useful Life (Years)	Average Age (Years)	Average Service Life Remaining (Years)
Hydrants	40 Years	46.5	-6.5
Water Buildings	50 Years	20.5	29.5
Water Mains	75 Years	42.7	32.3
Water Meters	40 Years	2.3	37.6
		44.3	**11.8**



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

5.1.4 Lifecycle Management Strategy

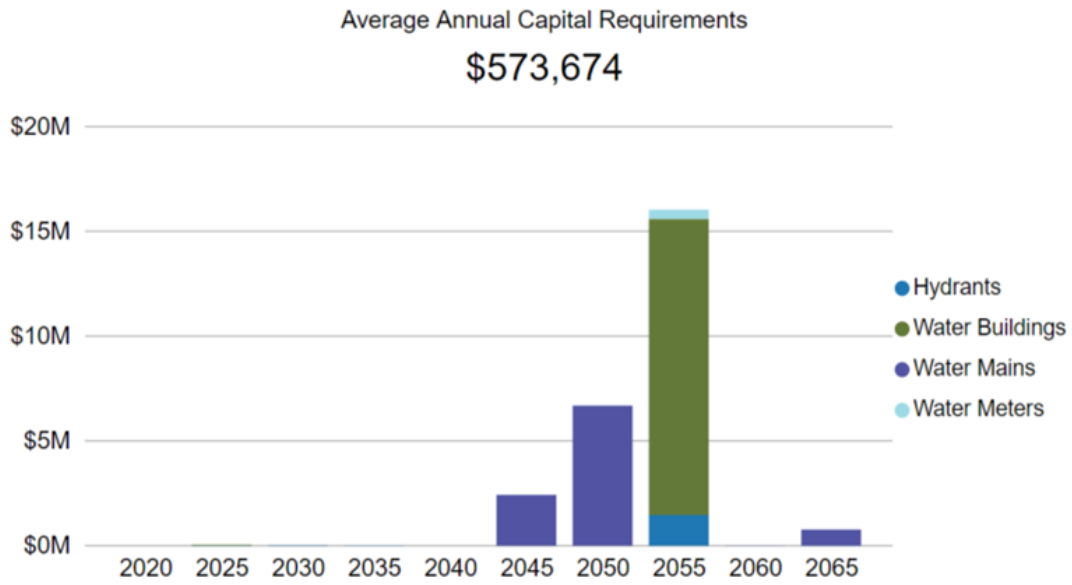
The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

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

Activity Type	Description of Current Strategy
Maintenance	Annual watermain flushing is completed
	The Township owns leak detection equipment and has previously completed leak detection activities to inform maintenance and rehabilitation programs
	Aquaflow units have been installed where freezing is common
Rehabilitation	The Township has experienced very few main breaks historically and addresses these on a reactive basis as necessary
Replacement	Water mains are expected typically replaced once the assets are deemed to have reached their end-of-life
	Prioritization focuses on affordability as key indicator

Forecasted Capital Requirements

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



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

5.1.5 Risk & Criticality

The following risk matrix provides a visual representation of the relationship between the probability of failure and the consequence of failure for the assets within this asset category. See Appendix C for the criteria used to determine the risk rating of each asset.

Critical Assets

The identification of critical assets allows the Township to determine appropriate risk mitigation strategies and treatment options. These may include asset-specific lifecycle strategies, condition assessment strategies, or simply the need to collect better asset data. Critical assets do not necessarily require immediate renewal or replacement.

The following table identifies critical assets according to the risk criteria identified in Appendix C. The risk rating is calculated by multiplying the probability of failure and the consequence of failure for each asset.

Segment	Name	Risk Rating
Water Buildings	1356 - B117 - WATER TREATMENT PLANT	8.2
Water Buildings	1358 - B125 - RAW WATER PUMPING STATION	8.2
Hydrants	1359 - Hyd1000-1005 - Front Street Hydrants	8
Hydrants	1360 - Hyd1010-1013 - Garden Street Hydrants	8
Hydrants	1361 - Hyd1030 - Front Street Hydrants	8
Hydrants	1362 - Hyd1040-1090 - Main Street Hydrants	8
Hydrants	1363 - Hyd1120-1123 - East Street Hydrants	8
Hydrants	1364 - Hyd11360-1380 - Davies Street Hydrants	8
Hydrants	1365 - Hyd1140-1190 - West Street Hydrants	8

5.1.6 Levels of Service

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

Community Levels of Service

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

Service Attribute	Qualitative Description	Current LOS (2019)
Scope	Description, which may include maps, of the user groups or areas of the municipality that are connected to the municipal water system	See Appendix B
	Description, which may include maps, of the user groups or areas of the municipality that have fire flow	See Appendix B
Reliability	Description of boil water advisories and service interruptions	There were no boil water advisories or major service interruptions to the Water Network in 2019.

Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2019)
Scope	% of properties connected to the municipal water system	71%
	% of properties where fire flow is available	14%
Reliability	# of connection-days per year where a boil water advisory notice is in place compared to the total number of properties connected to the municipal water system	0
	# of connection-days per year where water is not available due to water main breaks compared to the total number of properties connected to the municipal water system	0
Performance	Capital re-investment rate	0.66%

5.1.7 Recommendations

Asset Inventory

- All water meters are a pooled into a single entry in the asset inventory with no assigned quantity. This inventory should be unpooled to assist with detailed asset management planning and analysis.

Condition Assessment Strategies

- This AMP relies on age-based condition data for all water network infrastructure. The development of a network-wide condition assessment program will provide greater reliability in the accuracy of the current condition data.

Lifecycle Management Strategies

- Similar to other sub-surface infrastructure, most of the Water Network was built around the same time (1970s). While capital costs are expected to be minimal in the short-term, within 25-40 years significant capital costs are projected for the rehabilitation and/or replacement of water infrastructure. To ensure that money is available to meet future replacement requirements a reserve contribution strategy should be explored.

Levels of Service

- Continue to measure current levels of service to determine the impact of lifecycle management and funding strategies on network performance.
- Work towards identifying proposed levels of service as per O. Reg. 588/17 and identify the strategies that are required to close any gaps between current and proposed levels of service.

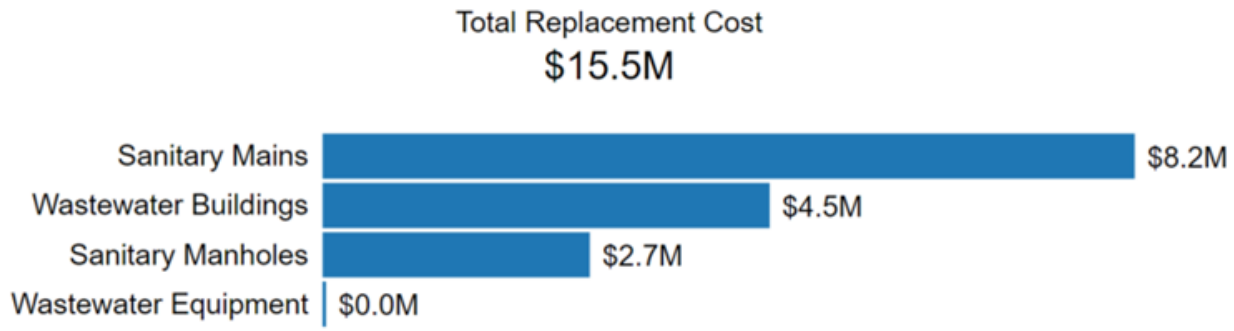
5.2 Wastewater Network

The Township of Ignace has contracted Northern Waterworks Inc. to oversee the collection and treatment of wastewater. They are responsible for ensuring that the sanitary sewer system is operational within the Township.

5.2.1 Asset Inventory & Replacement Cost

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

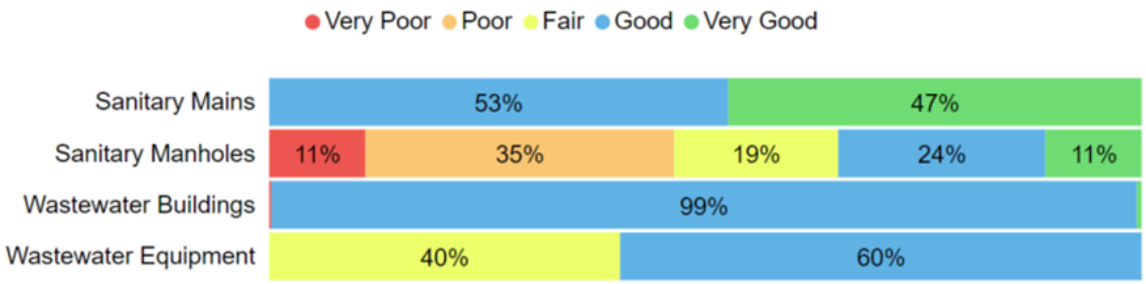
Asset Segment	Quantity	Replacement Cost Method	Total Replacement Cost
Sanitary Mains	15,071 m	Cost/Unit	$8,246,984
Sanitary Manholes	181	Cost/Unit	$2,715,000
Wastewater Buildings	4	CPI Tables	$4,541,481
Wastewater Equipment	4	CPI Tables	$37,301
			$15,540,766



5.2.2 Asset Condition

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

Asset Segment	Average Condition (%)	Average Condition Rating	Condition Source
Sanitary Mains	81%	Very Good	Age-based Condition
Sanitary Manholes	45%	Fair	Age-based Condition
Wastewater Buildings	79%	Good	Age-based Condition
Wastewater Equipment	61%	Good	Age-based Condition
	74%	**Good**	**100% Age-based Condition**



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

Current Approach to Condition Assessment

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

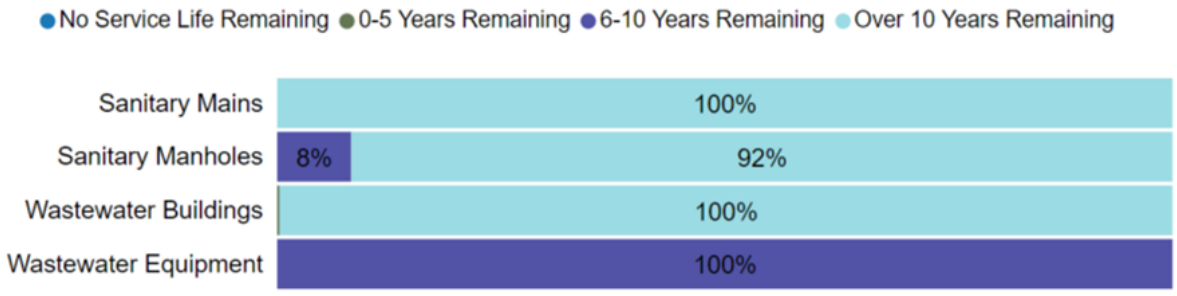
- At this time there is no formal approach to condition assessment for Wastewater Network assets
- On occasion, staff have used CCTV inspections for problem areas to inform operating and capital needs

5.2.3 Estimated Useful Life & Average Age

The Estimated Useful Life for Wastewater Network assets has been assigned according to a combination of established industry standards and staff knowledge. The Average Age of each asset is based on the number of years each asset has been in-service.

Finally, the Average Service Life Remaining represents the difference between the Estimated Useful Life and the Average Age, except when an asset has been assigned an assessed condition rating. Assessed condition may increase or decrease the average service life remaining.

Asset Segment	Estimated Useful Life (Years)	Average Age (Years)	Average Service Life Remaining (Years)
Sanitary Mains	75 Years	43.9	31.1
Sanitary Manholes	60 Years	33.3	26.8
Wastewater Buildings	50 Years	20.5	29.5
Wastewater Equipment	10 Years	3.8	6.3
		38.1	**28.7**



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

5.2.4 Lifecycle Management Strategy

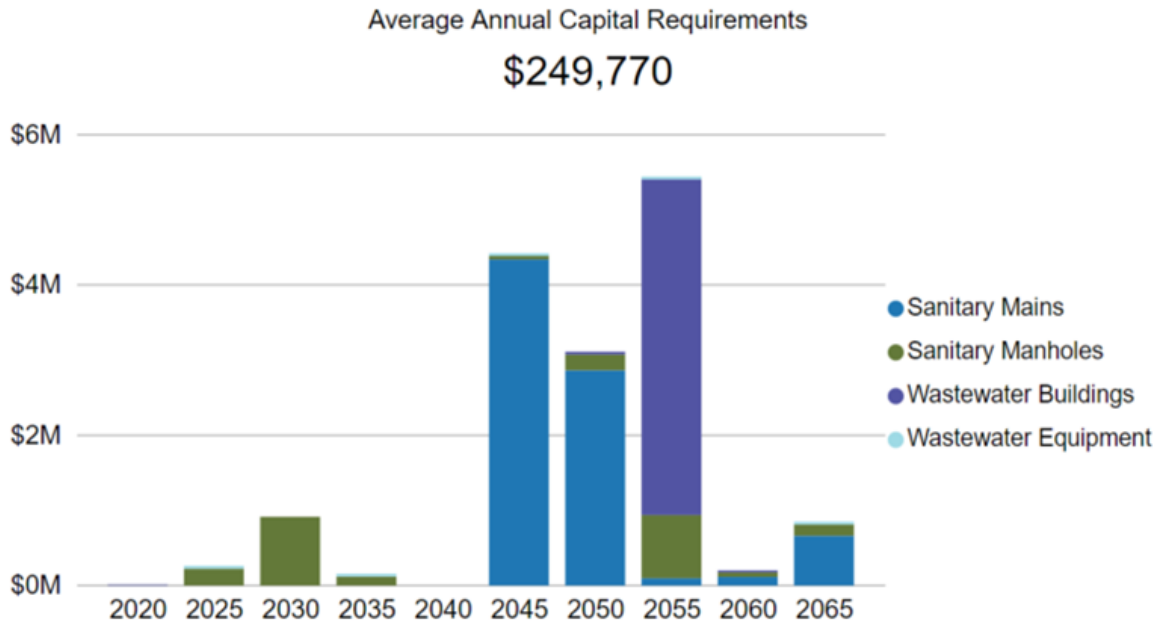
The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

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

Activity Type	Description of Current Strategy
Maintenance	Annual sanitary main flushing activities and cursory inspections are completed on the entire network
	Select areas (Davies and Lake Drive) require more regular flushing to mitigate the risk of service disruption
Rehabilitation	Trenchless re-lining activities have not been seriously explored, but may be evaluated for potential cost avoidance on pipes that are viable candidates
Replacement	In addition to age-based estimates of current asset condition staff rely on identified problem areas to determine a short-term replacement plan
	All mains will be replaced with PVC pipes which is considered the best value option available for installation

Forecasted Capital Requirements

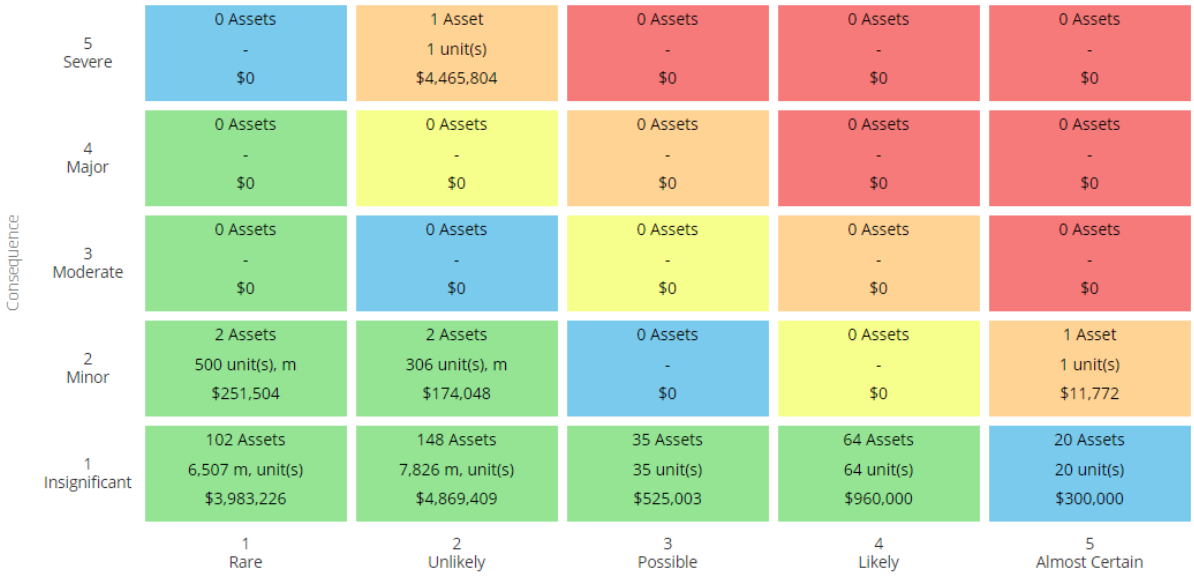
The following graph forecasts long-term capital requirements. The annual capital requirement represents the average amount per year that the Township should allocate towards funding rehabilitation and replacement needs.



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

5.2.5 Risk & Criticality

The following risk matrix provides a visual representation of the relationship between the probability of failure and the consequence of failure for the assets within this asset category. See Appendix C for the criteria used to determine the risk rating of each asset.



Critical Assets

The identification of critical assets allows the Township to determine appropriate risk mitigation strategies and treatment options. These may include asset-specific lifecycle strategies, condition assessment strategies, or simply the need to collect better asset data. Critical assets do not necessarily require immediate renewal or replacement.

The following table identifies critical assets according to the risk criteria identified in Appendix C. The risk rating is calculated by multiplying the probability of failure and the consequence of failure for each asset.

Segment	Name	Risk Rating
Wastewater Buildings	972 - B119 - STORAGE GARAGE - SEWAGE TR. PL.	11
Wastewater Buildings	971 - B118 - SEWER TREATMENT FACILITY	10
Sanitary Manholes	1019 - Mh-2520 - Manholes - Birch Pl.	6.5
Sanitary Manholes	1021 - Mh1100-1140 - Manholes - Garden St.	6.5
Sanitary Manholes	1024 - Mh1210 - Manholes - Nash St.	6.5

5.2.6 Levels of Service

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

Community Levels of Service

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

Service Attribute	Qualitative Description	Current LOS (2019)
Scope	Description, which may include maps, of the user groups or areas of the municipality that are connected to the municipal wastewater system	See Appendix B
Reliability	Description of how combined sewers in the municipal wastewater system are designed with overflow structures in place which allow overflow during storm events to prevent backups into homes	The Township does not own any combined sewers.
	Description of the frequency and volume of overflows in combined sewers in the municipal wastewater system that occur in habitable areas or beaches	The Township does not own any combined sewers.
	Description of how stormwater can get into sanitary sewers in the municipal wastewater system, causing sewage to overflow into streets or backup into homes	Stormwater can enter into sanitary sewers due to cracks in sanitary mains or through indirect connections (e.g. weeping tiles). In the case of heavy rainfall events, sanitary sewers may experience a volume of water and sewage that exceeds its designed capacity. In some cases, this can cause water and/or sewage to overflow into streets or backup into homes.

Service Attribute	Qualitative Description	Current LOS (2019)
	Description of how sanitary sewers in the municipal wastewater system are designed to be resilient to stormwater infiltration	The Township prioritizes the use of durable and resilient pipe materials to minimize stormwater infiltration into the municipal wastewater system. PVC pipes exhibit a high resistance to corrosion, cracks and leaks, while allowing for high flow rates that meet system capacity needs.
	Description of the effluent that is discharged from sewage treatment plants in the municipal wastewater system	The disconnection of weeping tiles from sanitary mains and the use of sump pumps and pits as an alternative can help to reduce the chance of this occurring.

Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2019)
Scope	% of properties connected to the municipal wastewater system	64%
Reliability	# of events per year where combined sewer flow in the municipal wastewater system exceeds system capacity compared to the total number of properties connected to the municipal wastewater system	0
	# of connection-days per year having wastewater backups compared to the total number of properties connected to the municipal wastewater system	0
	# of effluent violations per year due to wastewater discharge compared to the total number of properties connected to the municipal wastewater system	0
Performance	Capital re-investment rate	0.85%

5.2.7 Recommendations

Condition Assessment Strategies

- This AMP relies on age-based condition data for all water network infrastructure. The development of a network-wide condition assessment program will provide greater reliability in the accuracy of the current condition data.

Lifecycle Management Strategies

- Similar to other sub-surface infrastructure, most of the Wastewater Network was built around the same time (1970s). While capital costs are expected to be minimal in the short-term, within 25-40 years significant capital costs are projected for the rehabilitation and/or replacement of water infrastructure. To ensure that money is available to meet future replacement requirements a reserve contribution strategy should be explored.

Levels of Service

- Continue to measure current levels of service to determine the impact of lifecycle management and funding strategies on network performance.
- Work towards identifying proposed levels of service as per O. Reg. 588/17 and identify the strategies that are required to close any gaps between current and proposed levels of service.

6 Impacts of Growth

Key Insights

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

- Significant population and employment growth is forecasted to accompany the new development projects

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

6.1 Description of Growth Assumptions

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

6.1.1 Draft Official Plan/Background Study (2019)

The Township of Ignace Official Plan is intended to establish a vision, guiding principles, and policies to manage and direct development and change within the Township. A Draft Official Plan was submitted in April 2019 and is currently under review.

Ignace is positioned to experience significant potential population and employment growth over the next 20 years, as a result of the development of the Ring of Fire and the establishment of an Adaptive Phased Management facility by the Nuclear Waste Management Organization.

Assuming these two developments will go ahead, the following growth is expected:

	2016	2021	2026	2031	2036	2038	Net Change	Avg. Annual % Change
Population	1,210	1,290	1,911	2,110	4,285	4,310	+3,100	10.2%
Dwelling Units	590	630	921	1036	1959	1996	+1,406	10.1%
Employment	440	476	733	817	1720	1765	+1,325	12.2%

6.2 Impact of Growth on Lifecycle Activities

By July 1, 2024 the Township's asset management plan must include a discussion of how the assumptions regarding future changes in population and economic activity informed the preparation of the lifecycle management and financial strategy.

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

7 Financial Strategy

Key Insights

- The Township is committing approximately $526,000 towards capital projects per year from sustainable revenue sources

- Given the annual capital requirement of $2,047,000, there is currently a funding gap of $1,521,000 annually

- For tax-funded assets, we recommend increasing tax revenues by 2.2% each year for the next 20 years to achieve a sustainable level of funding

- For the Wastewater Network, we recommend increasing rate revenues by 2.1% annually for the next 20 years to achieve a sustainable level of funding

- For the Water Network, we recommend increasing rate revenues by 1.9% annually for the next 20 years to achieve a sustainable level of funding

7.1 Financial Strategy Overview

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

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

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

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

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

7.1.1 Annual Requirements & Capital Funding

Annual Requirements

The annual requirements represent the amount the Township should allocate annually to each asset category to meet replacement needs as they arise, prevent infrastructure backlogs and achieve long-term sustainability. In total, the Township must allocate approximately $2 million annually to address capital requirements for the assets included in this AMP.

Asset Category	Annual Capital Requirements
Road Network	$577,000
Water Network	$573,000
Buildings & Facilities	$363,000
Wastewater Network	$250,000
Fleet	$167,000
Storm Sewer Network	$45,000
Machinery & Equipment	$44,000
Land Improvements	$28,000
	$2,047,000

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

However, for the Road Network, lifecycle management strategies have been developed to identify capital costs that are realized through strategic rehabilitation and renewal of the Township's roads.

The development of these strategies allows for a comparison of potential cost avoidance if the strategies were to be implemented. The following table compares two scenarios for the Road Network:

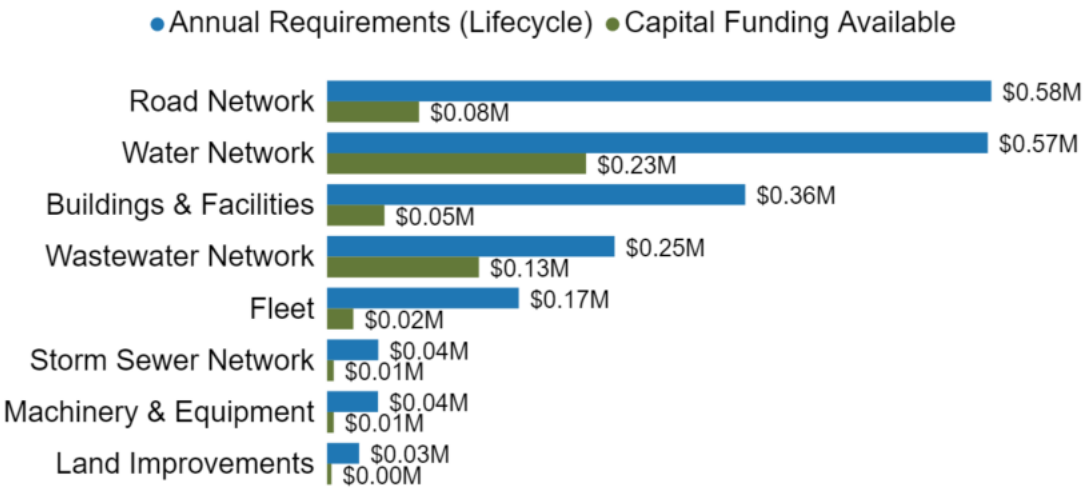
1. **Replacement Only Scenario**: Based on the assumption that assets deteriorate and – without regularly scheduled maintenance and rehabilitation – are replaced at the end of their service life.
2. **Lifecycle Strategy Scenario**: Based on the assumption that lifecycle activities are performed at strategic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

Asset Category	Annual Requirements (Replacement Only)	Annual Requirements (Lifecycle Strategy)	Difference
Road Network	$635,000	$577,000	$58,000

The implementation of a proactive lifecycle strategy for roads leads to a potential annual cost avoidance of $58,000 for the Road Network. This represents an overall reduction of the annual capital requirements for roads by 9%. As the lifecycle strategy scenario represents the lowest cost option available to the Township, we have used these annual requirements in the development of the financial strategy.

Annual Funding Available

Based on a historical analysis of revenue sources, the Township is committing approximately $526,000 towards capital projects per year from sustainable revenue sources. Given the annual capital requirement of $2,047,000, there is currently a funding gap of $1,521,000 annually.



7.2 Funding Objective

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

1. **Tax Funded Assets:** Road Network, Storm Sewer Network, Buildings & Facilities, Machinery & Equipment, Land Improvements, Fleet
2. **Rate-Funded Assets:** Water Network, Wastewater Network

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

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

7.3 Financial Profile: Tax Funded Assets

7.3.1 Current Funding Position

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

Asset Category	Avg. Annual Requirement	Annual Funding Available				Annual Deficit
		Taxes	Gas Tax	OCIF	Total Available	
Road Network	577,000	80,000	0	0	80,000	497,000
Storm Sewer Network	45,000	6,000	0	0	6,000	39,000
Buildings & Facilities	363,000	50,000	0	0	50,000	313,000
Machinery & Equipment	44,000	6,000	0	0	6,000	38,000
Land Improvements	28,000	4,000	0	0	4,000	24,000
Fleet	167,000	23,000	0	0	23,000	144,000
	1,224,000	**169,000**	**0**	**0**	**169,000**	**1,055,000**

The average annual investment requirement for the above categories is $1,224,000. Annual revenue currently allocated to these assets for capital purposes is $169,000 leaving an annual deficit of $1,055,000. Put differently, these infrastructure categories are currently funded at 14% of their long-term requirements.

7.3.2 Full Funding Requirements

In 2019, Township of Ignace has annual tax revenues of $2,160,000. As illustrated in the following table, without consideration of any other sources of revenue or cost containment strategies, full funding would require the following tax change over time:

Asset Category	Tax Change Required for Full Funding
Road Network	23.0%
Storm Sewer Network	1.8%
Buildings & Facilities	14.5%
Machinery & Equipment	1.8%
Land Improvements	1.1%
Fleet	6.7%
	48.9%

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

a) Ignace's debt payments for these asset categories will be decreasing by $0 over the next 5 years and by $122,000 over the next 10 years. Although not shown in the table, debt payment decreases will be $122,000 and $122,000 over the next 15 and 20 years respectively.

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

	Without Capturing Changes				With Capturing Changes			
	5 Years	10 Years	15 Years	20 Years	5 Years	10 Years	15 Years	20 Years
Infrastructure Deficit	1,055,000	1,055,000	1,055,000	1,055,000	1,055,000	1,055,000	1,055,000	1,055,000
Change in Debt Costs	N/A	N/A	N/A	N/A	0	-122,000	-122,000	-122,000
Change in OCIF Grants	N/A	N/A	N/A	N/A	0	0	0	0
Resulting Infrastructure Deficit:	**1,055,000**	**1,055,000**	**1,055,000**	**1,055,000**	**1,055,000**	**933,000**	**933,000**	**933,000**
Tax Increase Required	48.8%	48.8%	48.8%	48.8%	48.8%	43.2%	43.2%	43.2%
Annually:	**9.8%**	**4.9%**	**3.3%**	**2.4%**	**9.8%**	**4.3%**	**2.9%**	**2.2%**

7.3.3 Financial Strategy Recommendations

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

a) when realized, reallocating the debt cost reductions of $122,000 to the infrastructure deficit as outlined above.
b) increasing tax revenues by 2.2% 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.
c) allocating the current gas tax and OCIF revenue as outlined previously.
d) increasing existing and future infrastructure budgets by the applicable inflation index on an annual basis in addition to the deficit phase-in.

Notes:

1. As in the past, periodic senior government infrastructure funding will most likely be available during the phase-in period. By Provincial AMP rules, this periodic funding cannot be incorporated into an AMP unless there are firm commitments in place. For example, OCIF formula-based funding could be included since this funding is a multi-year commitment[3].
2. We realize that raising tax revenues by the amounts recommended above for infrastructure purposes will be very difficult to do. However, considering a longer phase-in window may have even greater consequences in terms of infrastructure failure.

Although this option achieves 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.

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.

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

7.4 Financial Profile: Rate Funded Assets

7.4.1 Current Funding Position

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

Asset Category	Avg. Annual Requirement	Annual Funding Available				Annual Deficit
		Rates	To Operations	Gas Tax	Total Available	
Water Network	574,000	580,000	-399,000	44,000	225,000	349,000
Wastewater Network	250,000	284,000	-181,000	29,000	132,000	118,000
	824,000	**864,000**	**-580,000**	**73,000**	**357,000**	**467,000**

The average annual investment requirement for the above categories is $824,000. Annual revenue currently allocated to these assets for capital purposes is $357,000 leaving an annual deficit of $467,000. Put differently, these infrastructure categories are currently funded at 43% of their long-term requirements.

7.4.2 Full Funding Requirements

In 2019, Ignace had annual sanitary revenues of $250,000 and annual water revenues of $574,000. As illustrated in the table below, without consideration of any other sources of revenue, full funding would require the following changes over time:

Asset Category	Tax Change Required for Full Funding
Water Network	60.2%
Wastewater Network	41.5%

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

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

a) Ignace's debt payments for water services will be decreasing by $132,000 over the next 20 years.

b) For wastewater services, there are no debt payment changes over the next 20 years.

Our recommendations include capturing the above changes and allocating them to the infrastructure deficit outlined above. The following table outlines this concept and presents a number of options without considering the re-allocation of returning debt costs:

	Water Network				Wastewater Network			
	5 Years	10 Years	15 Years	20 Years	5 Years	10 Years	15 Years	20 Years
Infrastructure Deficit	349,000	349,000	349,000	349,000	118,000	118,000	118,000	118,000
Tax Increase Required	60.2%	60.2%	60.2%	60.2%	41.5%	41.5%	41.5%	41.5%
Annually:	**12.0%**	**6.0%**	**4.0%**	**3.0%**	**8.3%**	**4.2%**	**2.8%**	**2.1%**

The following table includes the re-allocation of returning debt costs:

	Water Network				Wastewater Network			
	5 Years	10 Years	15 Years	20 Years	5 Years	10 Years	15 Years	20 Years
Infrastructure Deficit	349,000	349,000	349,000	349,000	118,000	118,000	118,000	118,000
Change in Debt Costs	0	0	0	-132,000	0	0	0	0
Resulting Deficit	**349,000**	**349,000**	**349,000**	**217,000**	**118,000**	**118,000**	**118,000**	**118,000**
Tax Increase Required	60.2%	60.2%	60.2%	37.4%	41.5%	41.5%	41.5%	41.5%
Annually:	**12.0%**	**6.0%**	**4.0%**	**1.9%**	**8.3%**	**4.2%**	**2.8%**	**2.1%**

7.4.3 Financial Strategy Recommendations

Considering all of the above information, we recommend the 20-year option that includes debt cost reallocations. This involves full funding being achieved over 20 years by:

a) when realized, reallocating the debt cost reductions of $132,000 for water services to the applicable infrastructure deficit.
b) increasing rate revenues by 2.1% for sanitary services and 1.9% for water services 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.
c) increasing existing and future infrastructure budgets by the applicable inflation index on an annual basis in addition to the deficit phase-in.

Notes:

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

Although this option achieves full funding on an annual basis in 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 $1,493,000 for the Water Network. Prioritizing future projects will require the current data to be replaced by condition-based data. Although our recommendations include no further use of debt, the results of the condition-based analysis may require otherwise.

7.5 Use of Debt

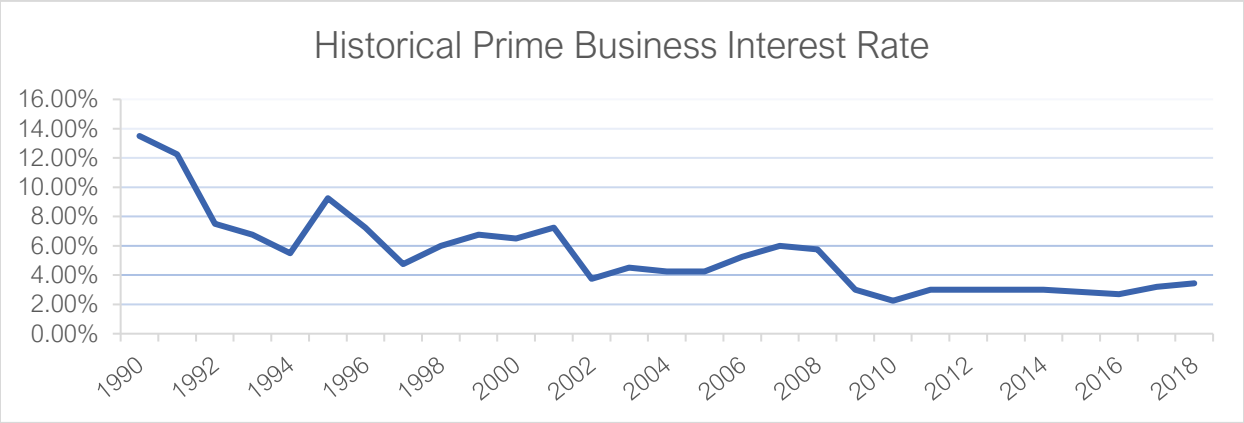
For reference purposes, the following table outlines the premium paid on a project if financed by debt. For example, a $1M project financed at 3.0%[4] over 15 years would result in a 26% premium or $260,000 of increased costs due to interest payments. For simplicity, the table does not consider the time value of money or the effect of inflation on delayed projects.

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

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

0.0%	0%	0%	0%	0%	0%	0%

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



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

The following tables outline how Ignace has historically used debt for investing in the asset categories as listed. There is currently $2,127,000 of debt outstanding for the assets covered by this AMP with corresponding principal and interest payments of $313,000, well within its provincially prescribed maximum of $1,022,000.

Asset Category	Current Debt Outstanding	Use of Debt in the Last Five Years				
		2015	2016	2017	2018	2019
Road Network	653,000	0	0	0	0	0
Storm Sewer Network	0	0	0	0	0	0
Bridges & Culverts	0	0	0	0	0	0
Buildings & Facilities	0	0	0	0	0	0
Machinery & Equipment	0	0	0	0	0	0
Land Improvements	0	0	0	0	0	0
Fleet	0	0	0	0	0	0
Total Tax Funded:	**653,000**	**0**	**0**	**0**	**0**	**0**
Water Network	710,000	0	0	0	0	0
Wastewater Network	764,000	0	1,000,000	0	0	0
Total Rate Funded:	**1,474,000**	**0**	**1,000,000**	**0**	**0**	**0**

Asset Category	Principal & Interest Payments in the Next Ten Years						
	2020	2021	2022	2023	2024	2025	2030
Road Network	122,000	122,000	122,000	122,000	122,000	122,000	0
Storm Sewer Network	0	0	0	0	0	0	0
Bridges & Culverts	0	0	0	0	0	0	0
Buildings & Facilities	0	0	0	0	0	0	0
Machinery & Equipment	0	0	0	0	0	0	0
Land Improvements	0	0	0	0	0	0	0
Fleet	0	0	0	0	0	0	0
Total Tax Funded:	**122,000**	**122,000**	**122,000**	**122,000**	**122,000**	**122,000**	**0**
Water Network	132,000	132,000	132,000	132,000	132,000	132,000	132,000
Wastewater Network	59,000	59,000	59,000	59,000	59,000	59,000	59,000
Total Rate Funded:	**191,000**	**191,000**	**191,000**	**191,000**	**191,000**	**191,000**	**191,000**

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

7.6 Use of Reserves

7.6.1 Available Reserves

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

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

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

Asset Category	Balance at December 31, 2019
Road Network	238,000
Storm Sewer Network	24,000
Buildings & Facilities	35,000
Machinery & Equipment	24,000
Land Improvements	15,000
Fleet	29,000
Total Tax Funded:	**365,000**
Water Network	217,000
Wastewater Network	73,000
Total Rate Funded:	**290,000**

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

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

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

7.6.2 Recommendation

In 2024, Ontario Regulation 588/17 will require Ignace to integrate proposed levels of service for all asset categories in its asset management plan update. We recommend that future planning should reflect adjustments to service levels and their impacts on reserve balances.

8 Appendices

Key Insights

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

Appendix A: 10-Year Capital Requirements

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

Road Network											
Asset Segment	Backlog	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Culverts	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Paved Roads	$0	$2,384,976	$1,103,928	$0	$0	$767,974	$2,362,168	$187,840	$0	$0	$0
Sidewalks	$0	$0	$0	$0	$148,033	$0	$0	$0	$0	$412,482	$0
Signs	$0	$0	$0	$0	$0	$0	$0	$0	$26,311	$0	$0
Streetlights	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	$0	**$2,384,976**	**$1,103,928**	**$0**	**$148,033**	**$767,974**	**$2,362,168**	**$187,840**	**$26,311**	**$412,482**	**$0**

Storm Sewer Network											
Asset Segment	Backlog	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Catchbasins	$0	$0	$0	$0	$0	$0	$84,000	$0	$28,000	$0	$20,000
Drywells	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Storm Equipment	$0	$0	$0	$7,521	$0	$0	$0	$0	$0	$0	$7,521
Storm Manholes	$0	$0	$0	$0	$0	$0	$300,000	$0	$0	$0	$0
Storm Sewer Mains	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	$0	**$0**	**$0**	**$7,521**	**$0**	**$0**	**$384,000**	**$0**	**$28,000**	**$0**	**$27,521**

Buildings & Facilities											
Asset Segment	Backlog	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Admin Buildings	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Airport Buildings	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Landfill Buildings	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Protection Buildings	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Public Works Buildings	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Recreation Buildings	$0	$32,000	$0	$100,000	$0	$2,412,000	$0	$0	$0	$0	$0
Storage Buildings	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	$0	**$32,000**	**$0**	**$100,000**	**$0**	**$2,412,000**	**$0**	**$0**	**$0**	**$0**	**$0**

Machinery & Equipment											
Asset Segment	Backlog	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Admin Equipment	$0	$6,726	$5,953	$48,280	$0	$0	$6,726	$5,953	$48,280	$0	$0
Fire Equipment	$0	$0	$29,200	$0	$0	$0	$0	$0	$0	$54,522	$0
Library Equipment	$274,338	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Public Works Equipment	$0	$0	$7,080	$0	$0	$21,706	$0	$0	$21,673	$0	$0
Recreation Equipment	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	$274,338	**$6,726**	**$42,233**	**$48,280**	**$0**	**$21,706**	**$6,726**	**$5,953**	**$69,953**	**$54,522**	**$0**

Fleet											
Asset Segment	Backlog	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Fire Vehicles	$0	$0	$0	$0	$0	$0	$700,000	$0	$0	$250,000	$0
Public Works Vehicles	$0	$0	$0	$0	$70,000	$0	$60,000	$0	$645,000	$165,000	$0
Recreation Vehicles	$0	$0	$35,000	$0	$0	$10,000	$0	$0	$100,000	$0	$0
	$0	**$0**	**$35,000**	**$0**	**$70,000**	**$10,000**	**$760,000**	**$0**	**$745,000**	**$415,000**	**$0**

Land Improvements											
Asset Segment	Backlog	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Airport Parking Lot	$0	$0	$0	$60,684	$0	$0	$0	$0	$0	$0	$0
Arena Parking Lot	$0	$0	$0	$29,000	$0	$0	$0	$0	$0	$0	$0
Library Parking Lot	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Shopping Plaza Parking Lot	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$112,412
Skate Park	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Town Hall Parking Lot	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	$0	**$0**	**$0**	**$89,684**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$112,412**

Water Network											
Asset Segment	Backlog	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Hydrants	$1,470,000	$0	$0	$0	$0	$0	$0	$0	$10,500	$0	$0
Water Buildings	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$37,011
Water Mains	$33,501	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Water Meters	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	$1,503,501	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$10,500**	**$0**	**$37,011**

Wastewater Network											
Asset Segment	Backlog	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Sanitary Mains	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Sanitary Manholes	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$225,000
Wastewater Buildings	$0	$0	$0	$11,772	$0	$0	$0	$0	$0	$0	$0
Wastewater Equipment	$0	$0	$0	$0	$0	$0	$15,003	$22,298	$0	$0	$0
	$0	**$0**	**$0**	**$11,772**	**$0**	**$0**	**$15,003**	**$22,298**	**$0**	**$0**	**$225,000**

All Asset Categories											
Asset Segment	Backlog	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Road Network	$0	$2,384,976	$1,103,928	$0	$148,033	$767,974	$2,362,168	$187,840	$26,311	$412,482	$0
Storm Sewer Network	$0	$0	$0	$7,521	$0	$0	$384,000	$0	$28,000	$0	$27,521
Buildings & Facilities	$0	$32,000	$0	$100,000	$0	$2,412,000	$0	$0	$0	$0	$0
Machinery & Equipment	$274,338	$6,726	$42,233	$48,280	$0	$21,706	$6,726	$5,953	$69,953	$54,522	$0
Fleet	$0	$0	$35,000	$0	$70,000	$10,000	$760,000	$0	$745,000	$415,000	$0
Land Improvements	$0	$0	$0	$89,684	$0	$0	$0	$0	$0	$0	$112,412
Water Network	$1,503,501	$0	$0	$0	$0	$0	$0	$0	$10,500	$0	$37,011
Wastewater Network	$0	$0	$0	$11,772	$0	$0	$15,003	$22,298	$0	$0	$225,000
	$1,777,839	**$2,423,702**	**$1,181,161**	**$257,257**	**$218,033**	**$3,211,680**	**$3,527,897**	**$216,091**	**$879,764**	**$882,004**	**$401,944**

Appendix B: Level of Service Maps

Appendix C: Risk Rating Criteria

Probability of Failure

Asset Category	Risk Criteria	Criteria Weighting	Value/Range	Probability of Failure Score
Road Network (Roads)	Condition	80%	80-100	1
			60-79	2
			40-59	3
			20-39	4
			0-19	5
	Surface Material	20%	Paved	2
			Chip Seal	3
			Gravel	4
Buildings & Facilities Machinery & Equipment Fleet Land Improvements	Condition	100%	80-100	1
			60-79	2
			40-59	3
			20-39	4
			0-19	5
Storm Sewer Network	Condition	70%	80-100	1
			60-79	2
			40-59	3
			20-39	4
			0-19	5
	Pipe Material	30%	Concrete	2
			CSP	4

Asset Category	Risk Criteria	Criteria Weighting	Value/Range	Probability of Failure Score
Wastewater Network	Condition	70%	80-100	1
			60-79	2
			40-59	3
			20-39	4
			0-19	5
	Pipe Material	30%	PVC	1
			Asbestos	4
Water Network	Condition	70%	80-100	1
			60-79	2
			40-59	3
			20-39	4
			0-19	5
	Pipe Material	30%	PVC	1
			PVCPOLYFUSION	1
			CI	3
			AC	5

Consequence of Failure

Asset Category	Risk Classification	Risk Criteria	Value/Range	Consequence of Failure Score
Road Network	Economic (70%)	Surface Material (70%)	Gravel	1
			Chip Seal	2
			Paved	4
		Road Type (30%)	Future Road	1
			Tertiary	2
			Secondary	3
		AADT (100%)	0 - 50	1
			50 - 100	2
			100 - 250	3
			250 - 400	4
			400+	5
Storm Sewer Network	Economic (70%)	Replacement Cost (100%)	$0 - $100,000	1
			$100,000 - $250,000	2
			$250,000 - $500,000	3
			$500,000 - $1,000,000	4
			$1,000,000 +	5
	Operational (20%)	Asset Segment (100%)	Catchbasin	2
			Catchbasin Leads	2
			Storm Mains	2
			Drywells	3
			Storm Manholes	4
	Social (10%)	Pipe Diameter (100%)	0 mm - 150 mm	1
			150 mm - 300 mm	2
			300 mm - 450 mm	3
			450 mm - 600 mm	4
			600 mm and above	5

Asset Category	Risk Classification	Risk Criteria	Value/Range	Consequence of Failure Score
Buildings & Facilities	Economic (70%)	Replacement Cost (100%)	$0 - $100,000	1
			$100,000 - $250,000	2
			$250,000 - $500,000	3
			$500,000 - $1,000,000	4
			$1,000,000 +	5
	Operational (30%)	Facility Type (100%)	Airport Buildings	1
			Storage Buildings	1
			Landfill Buildings	3
			Recreation Buildings	3
			Protection Buildings	4
			Public Works Buildings	4
			Admin Buildings	5
Machinery & Equipment	Manually Assigned Values		Fleetnet Interoperability Interface Equipment	1
			Radio Communication Equipment	1
			Scissor Lift	1
			Solar Panels - Public Works Garage Roof	2
			Storm Water Pump - Balsam Street	3
			Library Book Collection	3
			Wheel Chair Lift	4
			Jaws of Life	5
			Computer Network Server	5

Asset Category	Risk Classification	Risk Criteria	Value/Range	Consequence of Failure Score
Fleet	Manually Assigned Values		FV02 - 1978 GMC EQUIPMENT VAN #81	2
			OE03 - 2004 POLARIS 330 4 X 4	2
			PV01 - 2009 FORD F150 4 X 4	2
			PV17 - 2010 Chevy Silverado	2
			PV18 - 2010 Chevy Silverado	2
			PV05 - 2010 GMC 4 X 4	2
			PV14 - Bulldozer	3
			John Deere Lawn Mower	3
			PV15 - 2015 Dodge Crew Cab	3
			PV10 - 1995 JOHN DEERE BACKHOE	4
			ZAMBONI - 1999 ZAMBONI	4
			OE08 - JCB Skid Steer	4
			PV16 - 2012 VOLVO GRADER	4
			PV11 - 1995 JOHN DEERE LOADER	5
			FV04 - GMC PUMPER TRUCK 2004 STERLING	5
			FVO3 - 1990 FORD PUMPER TRUCK #83	5
Land Improvements	Manually Assigned Values		Airport Parking Lot	2
			Library Parking Lot	3
			Arena Parking Lot	4
			Shopping Plaza Parking Lot	4
			Town Hall Parking Lot	5

Asset Category	Risk Classification	Risk Criteria	Value/Range	Consequence of Failure Score
Wastewater Network	Economic (50%)	Replacement Cost (100%)	$0 - $100,000	1
			$100,000 - $250,000	2
			$250,000 - $500,000	3
			$500,000 - $1,000,000	4
			$1,000,000 +	5
	Environmental (15%)	Main Type (100%)	Gravity	3
			Force	5
	Operational (15%)	Asset Segment (100%)	Equipment	1
			Manholes	2
			Sanitary Mains	3
			Wastewater Buildings	5
	Social (10%)	Pipe Diameter (100%)	50 - 100mm	1
			100 - 150mm	2
			150 - 250mm	3
			250 - 350mm	4
			350mm +	5
Water Network	Economic (70%)	Replacement Cost (100%)	$0 - $100,000	1
			$100,000 - $250,000	2
			$250,000 - $500,000	3
			$500,000 - $1,000,000	4
			$1,000,000 +	5
	Operational (20%)	Asset Segment (100%)	Water Mains	2
			Water Buildings	2
			Curb Stops	3
			Hydrant Leads	3
			Hydrants	3
			Gate Valves	4
	Social (10%)	Pipe Diameter (100%)	0 mm - 50 mm	1
			50 mm - 150 mm	2
			150 mm - 200 mm	3
			200 mm - 250 mm	4
			250 mm and above	5

Appendix D: Condition Assessment Guidelines

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

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

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

Role of Asset Condition Data

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

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

Guidelines for Condition Assessment

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

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

condition rating. When engaging with external consultants to complete condition assessments, it is critical that these details are communicated as part of the contractual terms of the project.
There are many options available to the Township to complete condition assessments. In some cases, external consultants may need to be engaged to complete detailed technical assessments of infrastructure. In other cases, internal staff may have sufficient expertise or training to complete condition assessments.

Developing a Condition Assessment Schedule

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

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

Appendix E: Culverts-Road Network

Appendix E provides condition and recommendation on Culverts

JML Engineering Re. No. JML2022061 September 2022, Structural Inspection Three Culvert Sites for the Township of Ignace.

Lakeshore Drive Culvert- Recommended remedial repairs over the next 1-5 years.

The BCI (Bridge Condition Index) is 71, The BCI is the ratio of the value of each element in its current state to the total replacement value of the structure. The BCI value of the Lakeshore Drive Culvert implies that the structure is in good condition.

Estimated construction Costs: 1-5 years

Remove Trees growing between the culverts	$500.00
Replace Hazard Marker Signs	$1,500.00
Repair spalling concrete	$8,000.00
Rout and seal asphalt cracks	$2,000.00
Subtotal	$12,000.00
Mobilization/Demobilization (20%)	$2,500.00
Engineering and Contingency (35%)	$4000.00
Total Estimated Repair	$18,500.00 + HST

Estimated construction Cost for the next 5-10 years

Provide gaskets or sealants at precast concrete barrel joints.	
Cofferdams	$15,000.00
Clean Barrels	$5,000.00
Remove grout, prepare joints	$10,000.00
Seal joints	$10,000.00
Subtotal	$40,000.00
Mobilization/Demobilization (20%)	$8,000.00
Engineering and Contingency (35%)	$14,000.00
Total Estimated Repair Cost	$62,000.00 + HST

**Recommend the next inspection be completed in 2026*

West St Culvert – Recommended remedial repairs over the next 1-5 years.

BCI Index for West St Culvert is 69 and implies structure is in good condition.

Estimated construction costs:

Remove beaver dam upstream of crossing, remove vegetation	$1,000.00
Replace southwest Hazard marker signs.	$800.00
Repair erosion and stabilize both south embankments	$5,000.00
Repair spalling concrete.	$10,000.00
Rout and seal asphalt cracks	$3,000.00
Subtotal	$19,800.00
Mobilization/Demobilization (20%)	$4,000.00
Engineering/Contingency (35%)	$7,000.00
Total Estimated Repair Cost	$30,800.00 + HST

Estimated construction costs for the recommended remedial repairs 5-10 years.

Provide gaskets or sealant at joints.	
Cofferdams	$15,000.00
Clean barrels	$5,000.00
Remove grout, prepare joints	$10,000.00
Seal joints	$10,000.00
Subtotal	$40,000.00
Mobilization/Demobilization (20%)	$8,000.00
Engineering/Contingency (35%)	$14,000.00

**Recommend next inspection in 2026*

Pine Street Culvert – *JML52728: Recommended*

Excerpt: Observed on August 8th, 2022 field crew substantial structural deficiencies inside the tow barrels at the Pine Street culverts along the waterline. Extensive corrosion, large holes, and significant linear tears were observed. An additional report, titled "Significant Structural Deficiencies Pine Street Twin CSP Culverts at Agimak River" Dated August 11, 2022, summarized the observed deficiencies and made recommendations for a temporary road Closure to vehicular traffic.
On August 24th, 2022, John M. Lorenowich, P.Eng., and Bill Warren attended a Public Open House in Ignace discussing the structural deficiencies and recommendations for road closure at the Pine Street culvert site.

Pine Street Culvert -JML 2022061 Report Continued

BCI index is rated at 30 at Pine Street Culvert and is in very poor condition. This very low rating is a result of the very severe section loss and fill loss throughout both barrels.

JML recommended on Letter dated August 11, 2022 due to the deterioration of both barrels the structure be closed to traffic. Pine Street was closed as per recommendation on Sept 2nd, 2022. Following public meeting on September 1st, 2022.

Recommendations:

*Northwest embankment should be restored to prevent further erosion and eliminate the hazard of sliding embankment material.
Estimated cost is $3,000.00 + HST

Estimated construction cost to replace the structure is $1,000,000.00 - $1,500,000.00 +.

Recommended next inspection be done in 2023 due to the very poor condition of the Culverts.