THE CORPORATION OF THE MUNICIPALITY OF MAGNETAWAN

BY-LAW NO. 2022-04

Being a By-law to adopt a Municipal Asset Management Plan

WHEREAS the Corporation of the Municipality of Magnetawan must comply with O. Reg. 588/17 by July 1, 2022 under the *Infrastructure for Jobs and Prosperity Act, 2015*;

NOW THEREFORE the Council of the Corporation of the Municipality of Magnetawan enacts as follows:

1. THAT the Municipal Asset Management Plan in the form attached as Schedule 'A' to this By-Law, is adopted as a requirement pursuant to Ontario Regulation 588/17.

2. THAT this By-law shall come into full force and effect on the date and time of passing.

READ A FIRST, SECOND, AND THIRD TIME, passed, signed and the Seal of the Corporation affixed hereto this 19th day of January 2022.

Mayor

Clerk

Municipality of Magnetawan

Corporate Asset Management Program

Municipality of Magnetawan | 2021

Asset Management Plan

Municipality of Magnetawan

2021

This Asset Management Program was prepared by:

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

Key Statistics

Replacement cost of asset portfolio
$49.1 million

Replacement cost of infrastructure per household
$77,922 (2016)

Percentage of assets in fair or better condition
61%

Percentage of assets with assessed condition data
56%

Annual capital infrastructure deficit
$600,000

Recommended timeframe for eliminating annual infrastructure deficit
15 Years

Target reinvestment rate
5.8%

Actual reinvestment rate
4.5%

Executive Summary

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

Scope

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

This AMP include the following asset categories:

With the development of this AMP the Municipality has achieved compliance with O. Reg. 588/17 to the extent of the requirements that must be completed by July 1, 2022. There are additional requirements concerning non-core assets, proposed levels of service, and growth that must be met by July 1, 2024 and 2025.

Findings

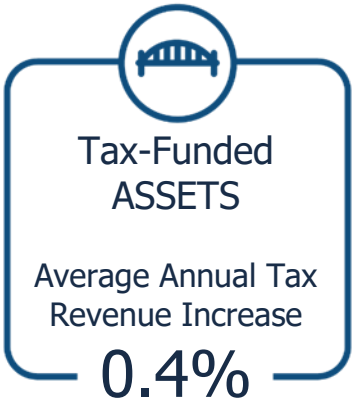
The overall replacement cost of the asset categories included in this AMP totals $49.1 million. 61% of all assets analysed in this AMP are in fair or better condition and assessed condition data was available for 56% of assets. For the remaining 44% of assets, assessed condition data was unavailable, and asset age was used to approximate condition – a data gap that is seen 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 presents proactive life strategies for paved roads that the Municipality can consider for the lowest cost option to maintain levels of service. However, the financial analysis and recommendations are based on replacement only strategies for all assets, as this best reflects the Municipality's current approach to managing assets.

To meet capital replacement and rehabilitation needs for existing infrastructure, prevent infrastructure backlogs, and achieve long-term sustainability, the Municipality's average annual capital requirement totals $2.8 million. Based on a historical analysis of sustainable capital funding sources, the Municipality is committing approximately $2.2 million towards capital projects or reserves per year. As a result, there is currently an annual funding gap of $600,000.

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

Recommendations

A financial strategy was developed to address the annual capital funding gap. The following graphics shows annual tax change required to eliminate the Municipality's infrastructure deficit based on a 15-year plan:



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

- Ensure asset inventory contains the most up to date condition data
- Develop a condition assessment strategy with a regular schedule
- Review and refine the lifecycle strategies to realistically meet the constraints of the Municipality
- Implement risk-based decision-making in asset management planning and adjust models based on evolving understanding of priorities
- Development and regularly review short- and long-term plans to meet capital requirements
- Measure current levels of service and identify sustainable proposed levels of service

1 Introduction & Context

Key Insights

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

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

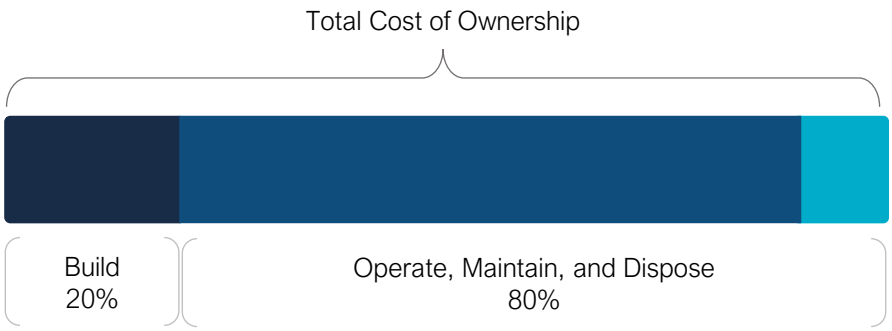
- An asset management plan is a living document that should be updated regularly to inform long-term planning

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

1.1 An Overview of Asset Management

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

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



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

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

1.1.1 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 Municipality adopted By-law No. 2019-43 "Being a By-law to Establish a Strategic Asset Management Policy" on June 26th, 2019, in accordance with Ontario Regulation 588/17.

The asset management plan considers, "With the exception of land, all assets meeting the single asset capitalization thresholds detailed in the Municipality's *PSAB 3150 Policies – Tangible Capital Asset Policies* will be included in the *Asset Management Plan*. This includes the Municipality's proportionate share of the assets of any shared or fully-controlled services."

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 Municipality'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. The asset management plan strategically aligns with the Municipality's Official Plan, the Regional Economic Development Plan, Service Level Delivery Reviews, Municipality's Emergency Management Response Plan, and other related policies.

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 or improved through a combination of maintenance and rehabilitation, but at some point, replacement is required. Understanding what effect these activities will have on the lifecycle of an asset, and their cost, will enable staff to make better recommendations.

The Municipality's approach to lifecycle management for the Road Network category, and Bridges & Culverts category are 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

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. When limited funds are available, such as eliminating the infrastructure backlog, risk can be useful to prioritize and ensure funds are managed in a way that minimizes risk.

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

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

High-Level Service Indicators

While community and technical levels of service provide a description of the service provided or performance metrics, these do not always provide a clear, concise illustration of how the competing demands of fiscal constraints, performance, and risk is managed. Measuring and

evaluating levels of service is a matter of finding a balance between three key indicators: cost, performance, and risk. This balance will inform the high-level decisions of the municipality to key decisions, such as whether it is acceptable to take on more costs to achieve better performance. Ultimately, these key indicators will be supplemented by the community and technical levels of service for further context of service provisions. The criteria for the high-level service indicators are described in the following table:

Indicator	Metric	Measurement
Cost	Annual Average Capital Invested	Annual funding available for each asset category derived from sustainable sources
	Average Annual Capital Required	Annual funding required to sustain and renew the current asset portfolio
Performance	Overall Condition	% of assets in very good, good, fair, poor, and very poor condition
Risk	Overall Risk Distribution	% of assets in very low, low, moderate, high, and very high state of risk

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

Technical Levels of Service

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

For core asset categories (Roads, Bridges & Culverts, Water, Wastewater, Stormwater) the Province, through O. Reg. 588/17, has provided technical metrics that are required to be included in this AMP.

Current and Proposed Levels of Service

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

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

1.3 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.

2019

Strategic Asset Management Policy

2022

Asset Management Plan for Core Assets with the following components:

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

2024

Asset Management Plan for Core and Non-Core Assets

2025

Asset Management Policy Update and an Asset Management Plan for All Assets with the following additional components:

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

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, 2022. Next to each requirement a page or section reference is included in addition to any necessary commentary.

Requirement[1]	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] The 2022 requirements apply to core assets only, which are the roads and bridges and culverts. In 2024 and 2025 these requirements will be extended to all assets.

2 Scope and Methodology

Key Insights

- This asset management plan includes 6 tax-funded asset categories

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

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

2.1 Asset categories included in this AMP

This asset management plan for the Municipality of Magnetawan is produced in compliance with Ontario Regulation 588/17. The July 2022 deadline under the regulation—the first of three AMPs—requires analysis of only core assets (roads, bridges & culverts, water, wastewater, and stormwater).

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

Asset Category	Source of Funding
Road Network	Tax Levy
Bridges & Culverts	
Buildings	
Machinery & Equipment	
Vehicles	
Land Improvements	

2.2 Deriving Replacement Costs

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

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

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

2.3 Estimated Useful Life and Service Life Remaining

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

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

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

2.4 Reinvestment Rate

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

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

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

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

2.5 Deriving Asset Condition

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

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

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

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

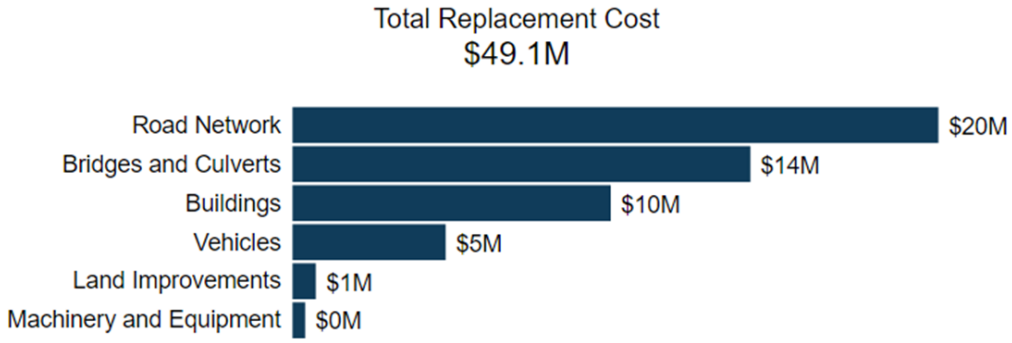
3 Portfolio Overview

Key Insights

- The total replacement cost of the Municipality's asset portfolio is $49.1 million
- The Municipality's target re-investment rate is 5.78%, and the actual re-investment rate is 4.49%, contributing to an expanding infrastructure deficit
- 61% of all assets are in fair or better condition
- 68% of assets are projected to require replacement in the next 10 years
- Average annual capital requirements total $2.2 million per year across all assets

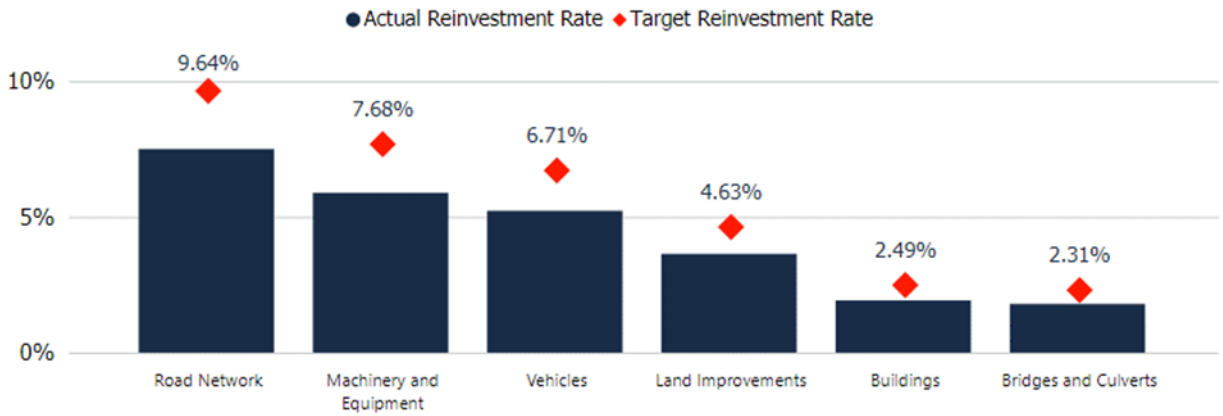
3.1 Total Replacement Cost of Asset Portfolio

The asset categories analyzed in this AMP have a total replacement cost of $49.1 million based on inventory data from 2020. This total was determined based on a combination of user-defined costs and historical cost inflation. This estimate reflects replacement of historical assets with similar, not necessarily identical, assets available for procurement today.



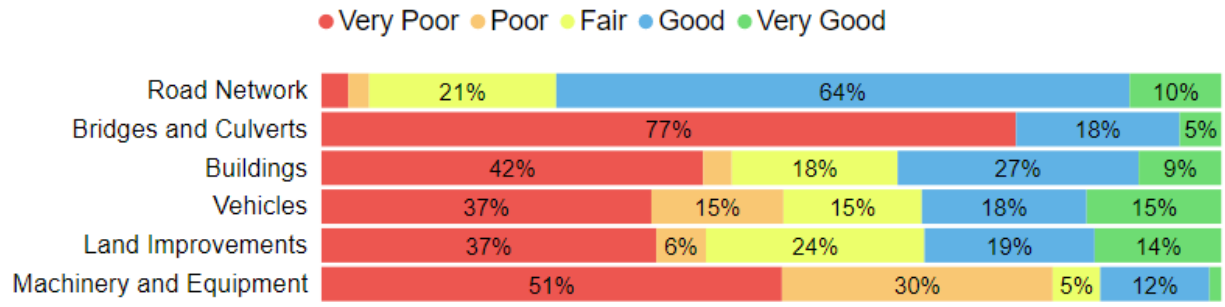
3.2 Target vs. Actual Reinvestment Rate

The graph below depicts funding gaps or surpluses by comparing target vs actual reinvestment rate. To meet the long-term replacement needs, the Municipality should be allocating approximately $2.8 million annually, for a target reinvestment rate of 5.78%. Actual annual spending on infrastructure totals approximately $2.2 million, for an actual reinvestment rate of 4.49%.



3.3 Condition of Asset Portfolio

The current condition of the assets is central to all asset management planning. Collectively, 22% of assets in Magnetawan are in fair or better condition. This estimate relies on both age-based and field condition data.

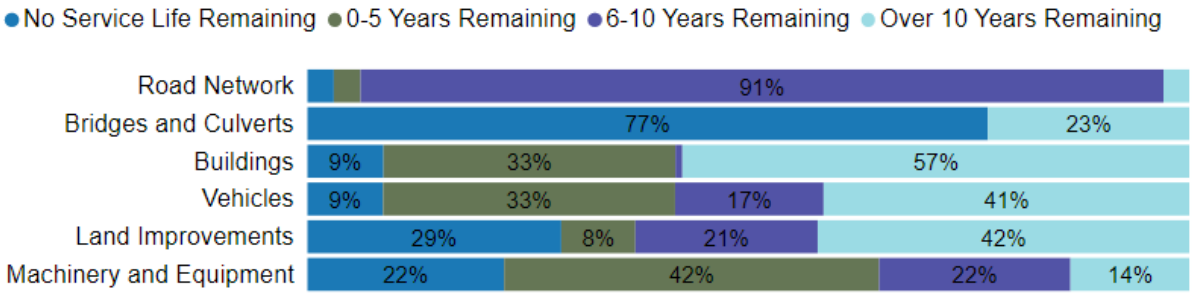


This AMP relies on assessed condition data for 56% of assets; for the remaining portfolio, age is used as an approximation of condition. Assessed condition data is invaluable in asset management planning as it reflects the true condition of the asset and its ability to perform its functions. The table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

Asset Category	Asset Segment	% of Assets with Assessed Condition	Source of Condition Data
Road Network	Paved Roads	94%	2020 Roads Needs Study
Bridges & Culverts	Bridges	0%	N/A
	Structural Culverts	0%	N/A
Buildings	All	16%	Staff Assessments
Machinery & Equipment	All	25%	Staff Assessments
Vehicles	All	80%	Staff Assessments
Land Improvements	All	0%	N/A

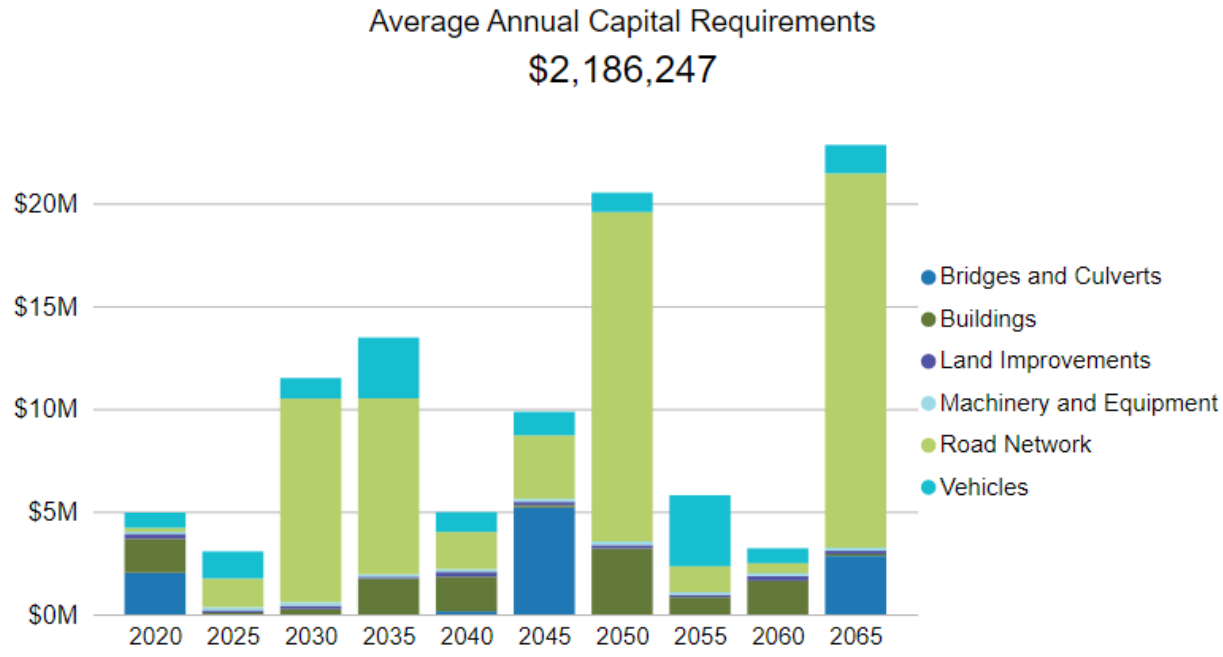
3.4 Service Life Remaining

Based on asset age, available assessed condition data and estimated useful life, 68% of the Municipality'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 Municipality 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 $49 million
- 22% 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 $2.2 million
- Critical assets should be evaluated to determine appropriate risk mitigation activities and treatment options through Staff experience or third-party expertise

4.1 Road Network

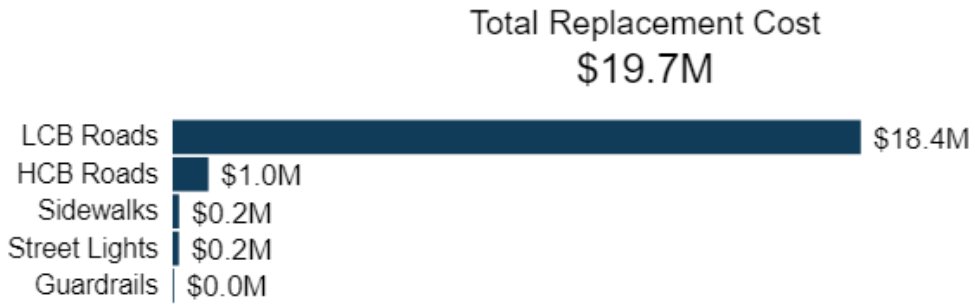
The Road Network is a critical component of the provision of safe and reliable transportation services and represents the highest value asset category in the Municipality's asset portfolio. It includes all municipally owned and maintained roadways in addition to supporting roadside infrastructure including guardrails and streetlights. Sidewalks are managed through Parks staff.

The Municipality's roads are maintained by the Public Works & Parks Staff who are also responsible for winter snow clearing, ice control and snow removal operations.

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 Municipality's Road Network inventory.

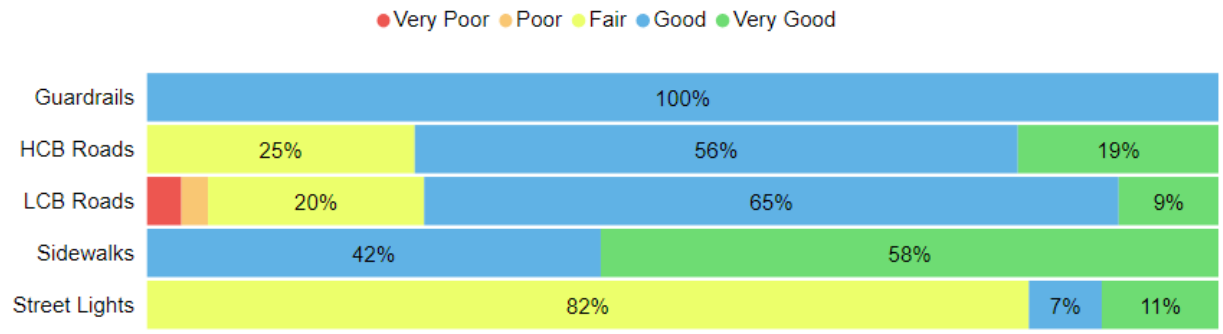
Asset Segment	Quantity	Replacement Cost Method	Total Replacement Cost
Guardrails	0.8 km	User-Defined Cost	$8,459
HCB Roads	1.6 km	User-Defined Cost	$960,000
LCB Roads	52.4 km	User-Defined Cost	$18,350,500
Sidewalks	0.8 km	User-Defined Cost	$179,186
Street Lights	24	89% User-Defined Cost and 11% CPI Tables	$174,190
			$19,672,335



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. Overall, the road network is in Good condition

Asset Segment	Average Condition (%)	Average Condition Rating	Condition Source
Guardrails	80%	Very Good	2020 Roads Needs Study
HCB Roads	63%	Good	2020 Roads Needs Study
LCB Roads	64%	Good	2020 Roads Needs Study
Sidewalks	78%	Good	Age-based
Street Lights	49%	Fair	Age-based
	64%	**Good**	94% Assessed



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:

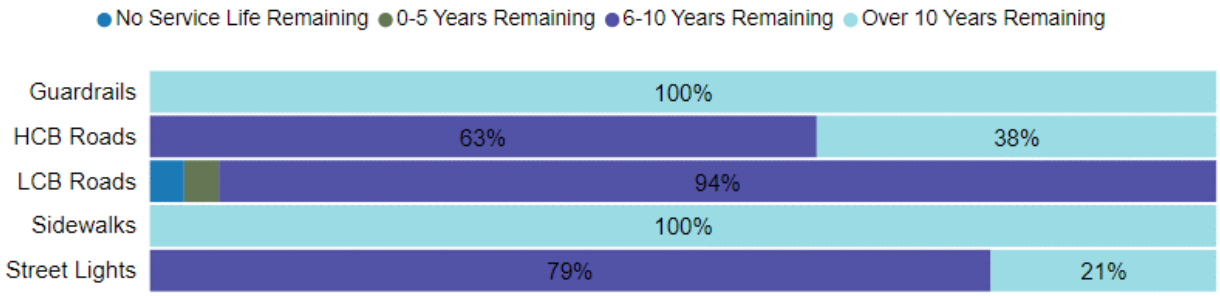
- Magnetawan has completed roads needs studies in the past, most recently completed in 2020. These documents provide a detailed, inspection-based, recording of condition and defects of the road. The Municipality is considering a suitable interval for completing these studies going forward.

- Required road patrols are conducted. Staff are informed by complaints and have knowledge of problem areas due to road patrols and maintenance. Staff take notes and outline deficiencies, which are used to inform the capital program year to year.

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. A negative value for the average service life remaining indicates that an asset is beyond its useful life but is still functioning because of the lifecycle activities being completed.

Asset Segment	Estimated Useful Life (Years)	Average Age (Years)	Average Service Life Remaining (Years)
Guardrails	75 Years	7.5	59
HCB Roads	20 Years	11.0	10.8
LCB Roads	10 Years	11.1	7.1
Sidewalks	40 Years	9.0	31.0
Street Lights	20 – 40 Years	5.9	29.1
		10.0	**12.9**



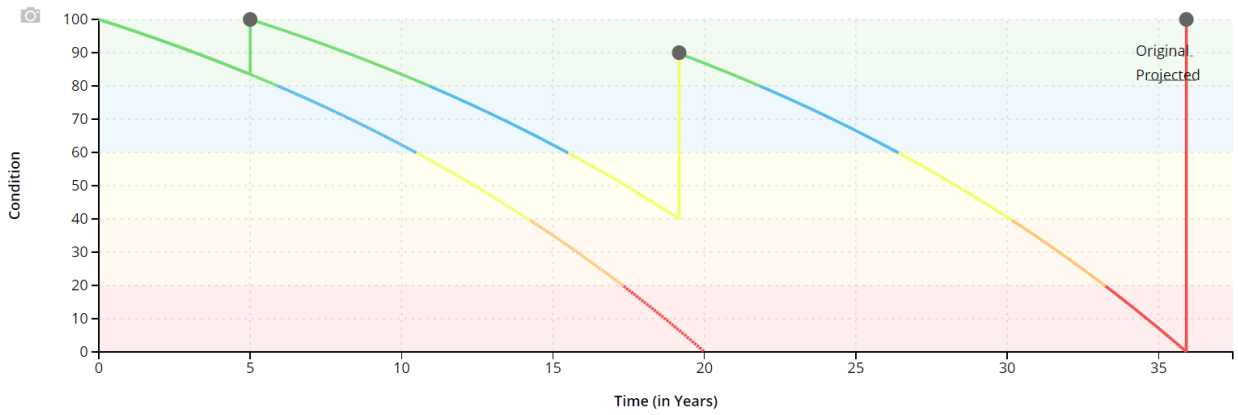
Each asset's Estimated Useful Life should be reviewed periodically by Staff to determine if third party review is required to better align with the observed length of service life for each asset type.

4.1.4 Lifecycle Management Strategy

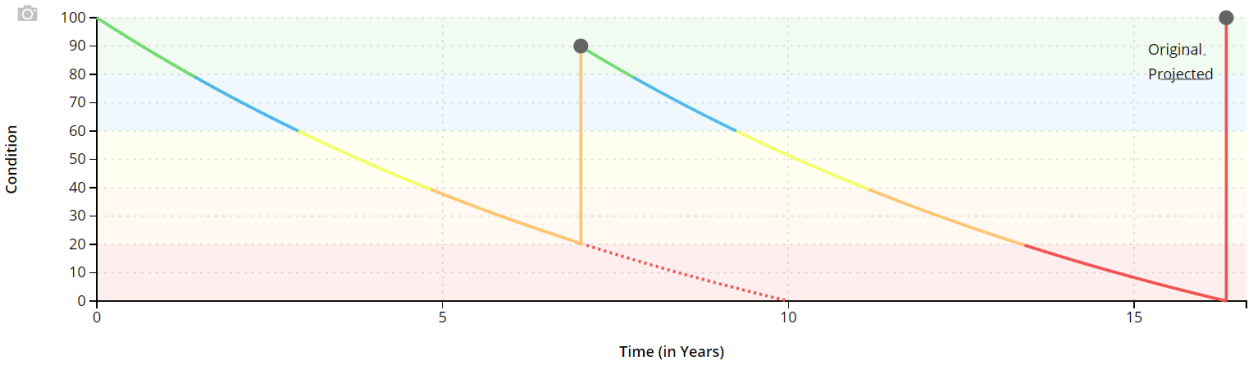
The condition or performance of most assets will deteriorate over time. This process is affected by a range of factors including an asset's characteristics, location, utilization, maintenance history and environment.

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

Asphalt (HCB)		
Event Name	**Event Class**	**Event Trigger**
Slurry Seal	Preventative Maintenance	5 Years
Single Mill and Pave	Rehabilitation	40% Condition
Full Reconstruction	Replacement	36 Years

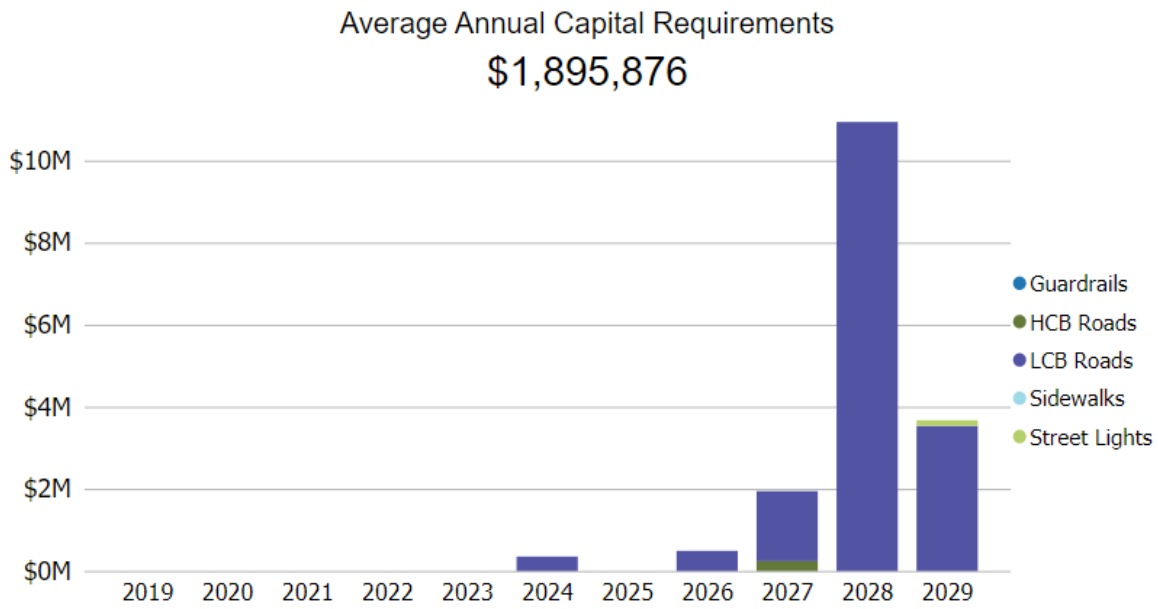


Tar and Chip (LCB)		
Event Name	**Event Class**	**Event Trigger**
Single Surface Treatment	Rehabilitation	20% Condition
Full Reconstruction	Replacement	16 Years



Forecasted Capital Requirements

The annual capital requirement represents the average amount per year that the Municipality should allocate towards funding rehabilitation and replacement needs to meet future capital needs. The following graph forecasts the capital requirements for the Road Network

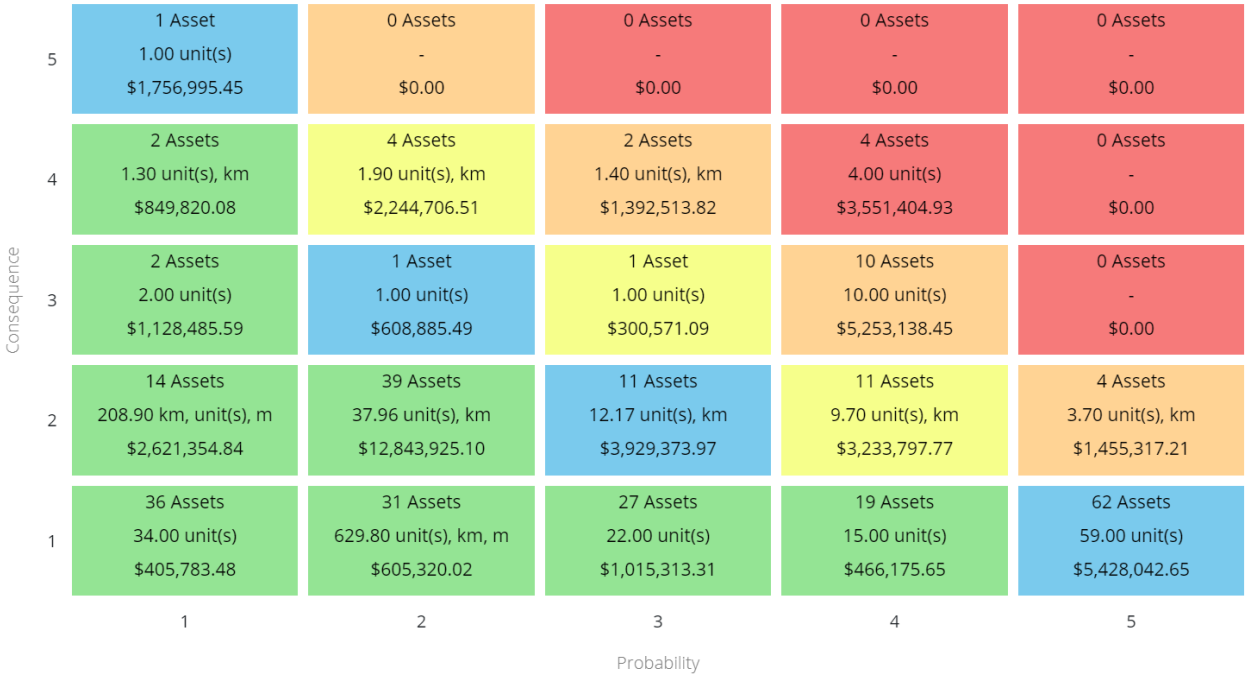


The projected cost of lifecycle activities that will need to be undertaken over the next 10 years to maintain the current level of service can be found in Appendix A.

4.1.5 Risks & Criticality

Risk Matrix

The following risk matrix provides a visual representation of the relationship between the probability of failure and the consequence of failure for the assets within this asset category based on 2020 inventory data. See Appendix D for the criteria used to determine the risk rating of each asset.



Risks to Current Asset Management Strategies

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

Climate Change & Extreme Weather Events

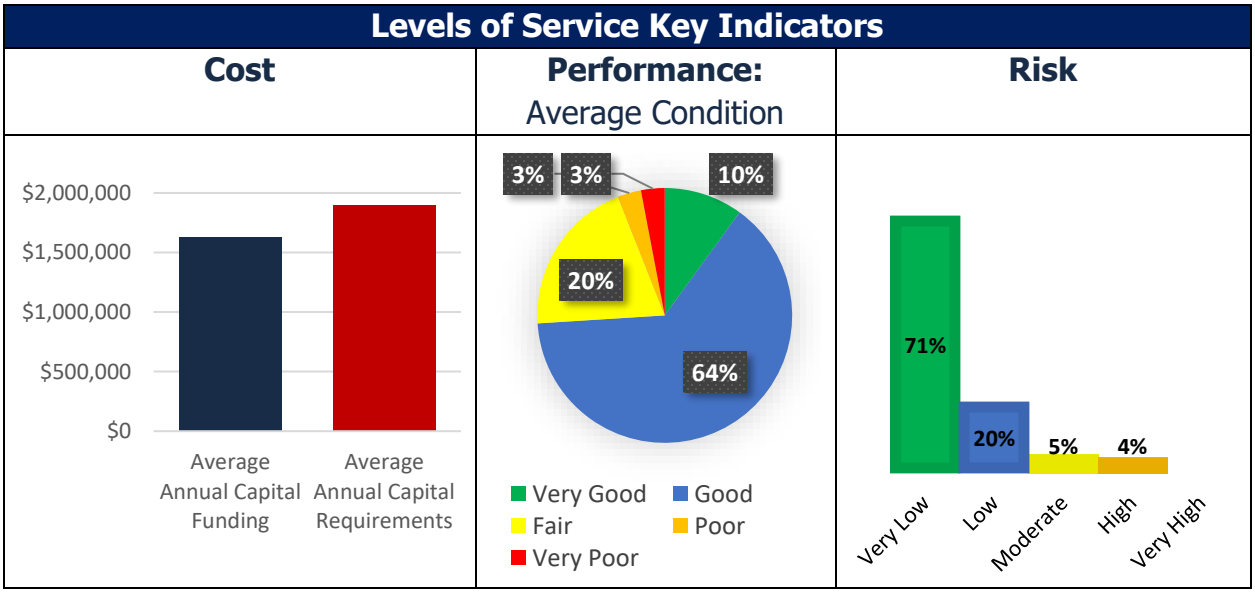
An increase in freeze/thaw cycles causes road pavement to heave and settle. This can cause the accelerated deterioration of road surface pavement which leads to an increased need for maintenance and rehabilitation. Road washouts have been an issue. The uncertainty surrounding the impact of extreme weather events can make changing conditions difficult to plan for.

Organizational Capacity and Expectations

Staff find it a continuous challenge to dedicate staff resource time towards data collection and ongoing maintenance activities while maintaining public expectations during unforeseen events. Road washouts and managing wildlife disruptions are examples that have taken place and require time and resources to mitigate.

4.1.6 Levels of Service

The following table outlines the high-level service indicators for the Road Network: Cost, performance (condition), and risk.



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

Community Levels of Service

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

Service Attribute	Qualitative Description	Current LOS (2020)
Scope	Description, which may include maps, of the road network in the municipality and its level of connectivity	The majority of the Municipality's roads are unpaved and LCB. The majority of the network is rural, however, there are two small urban centres that utilize a mix of HCB and LCB roads that are mainly local and collector.
Quality	Description or images that illustrate the different levels of road class pavement condition	The condition of roads are based on their projected age and estimated useful life. From that, a score of 0-100 is assigned as the condition rating. A 0-19 score is considered to be very poor. A 20-39 score is considered to be poor. A 40-59 score is considered to be fair. A 60-79 score is considered to be good. An 80-100 score is considered to be very good.

Technical Levels of Service

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

Service Attribute	**Technical Metric**	**Current LOS (2020)**
Scope	Lane-km of arterial roads (MMS classes 1 and 2) per land area (km/km^2)	0
	Lane-km of collector roads (MMS classes 3 and 4) per land area (km/km^2)	0.16
	Lane-km of local roads (MMS classes 5 and 6) per land area (km/km^2)	0.72
Quality	Average pavement condition index for paved roads in the municipality	HCB: 57% LCB: 13%
	Average surface condition for unpaved roads in the municipality (e.g., excellent, good, fair, poor)	Very Poor

4.1.7 Recommendations

Lifecycle Management Strategies

- Implement the identified lifecycle management strategies for HCB and particularly LCB roads to realize potential cost avoidance and maintain a high quality of road pavement condition.
- Evaluate the efficacy of the Municipality's lifecycle management strategies at regular intervals to determine the impact cost, condition, and risk.
- Review and refine lifecycle strategies with Road Needs Study recommendations

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

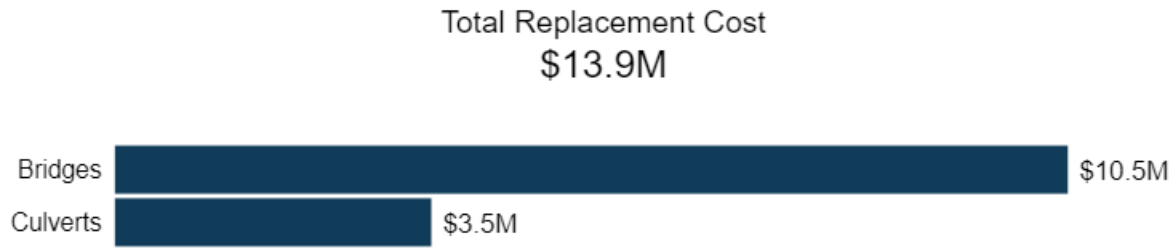
4.2 Bridges & Culverts

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

4.2.1 Asset Inventory & Replacement Cost

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

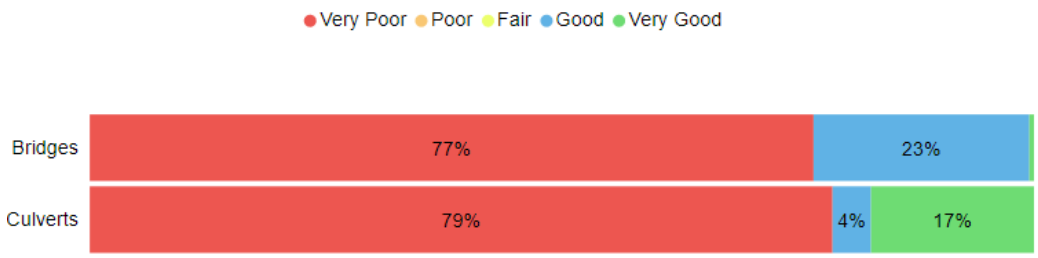
Asset Segment	Quantity	Replacement Cost Method	Total Replacement Cost
Bridges	19	User-Defined Cost	$10,468,846
Structural Culverts	9	User-Defined Cost	$3,478,931
			$13,947,777



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. Although a detailed OSIM inspection report was available in 2019, summarizing structural defects and critical repairs, it did not provide an overall condition score for each structure. The next OSIM report should include a deliverable that generates a condition score for each asset. Age-based condition was used instead, which only consider the age and estimated useful life of each structure. These age-based estimates may understate the true condition of each structure.

Asset Segment	Average Condition (%)	Average Condition Rating	Condition Source
Bridges	18%	Very Poor	Age-based
Structural Culverts	17%	Very Poor	Age-based
	17%	**Very Poor**	**Age-based**



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

Current Approach to Condition Assessment

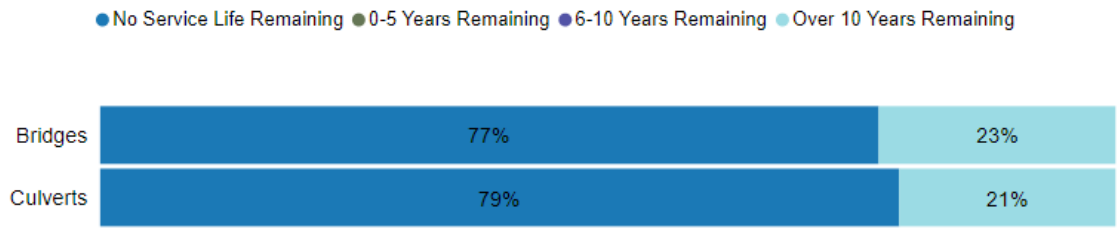
Accurate and reliable condition data allows staff to more confidently determine the remaining service life of assets and identify the most cost-effective approach to managing assets. The following describes the municipality's current approach:

- Condition assessments of all bridges and culverts with a span greater than or equal to 3 meters are completed every 2 years in accordance with the Ontario Structure Inspection Manual (OSIM)

4.2.3 Estimated Useful Life & Average Age

The Estimated Useful Life for Bridges & Culverts 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. A negative value for the average service life remaining indicates that an asset is beyond its intended useful life but may still be functioning because of the lifecycle activities being completed.

Asset Segment	Estimated Useful Life (Years)	Average Age (Years)	Average Service Life Remaining (Years)
Bridges	30 – 60 Years	58.1	-6.0[2]
Structural Culverts	30 – 60 Years	30.9	5.8
		49.4	**-2.3**



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.

[2] Most bridges have an in-service date prior to 1970. Although they have exceeded their estimated useful life, rehabilitations have restored these bridges to remain serviceable.

4.2.4 Lifecycle Management Strategy

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

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

Activity Type	Description of Current Strategy
Maintenance, Rehabilitation and Replacement	All lifecycle activities are driven by the results of mandated structural inspections competed according to the Ontario Structure Inspection Manual (OSIM) In-house maintenance activites are completed on a periodic basis such as regular cleaning, maintaining guiderails, and applying sealant Most major repairs require grant funding Structures are generally replaced and rehabilitated as reccomended by the OSIM reccomendations. When budgets are insufficient, structures are are prioritized by traffic volume
Inspection	The most recent inspection report was completed in 2019 by GHD. This report identifies defects and a renewal plan, but does not provide a overall condition score for each structure.

Forecasted Capital Requirements

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

The 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 Risks & Criticality

Risk Matrix

The following risk matrix provides a visual representation of the relationship between the probability of failure and the consequence of failure for the assets within this asset category based on 2020 inventory data. See Appendix D for the criteria used to determine the risk rating of each asset.

Risks to Current Asset Management Strategies

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

Capital Funding Strategies

Major capital rehabilitation projects for bridges and culverts are heavily dependant on the availability of grant funding opportunities. When grants are not available, bridge rehabilitation projects may be deferred. An annual capital funding strategy reduces dependency on grant funding and helps prevent deferral of capital works.

Climate Change & Extreme Weather Events

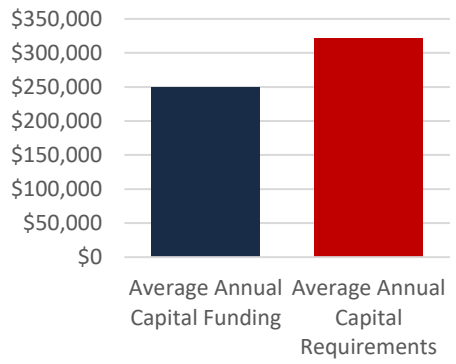
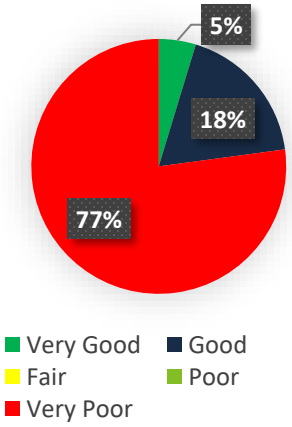
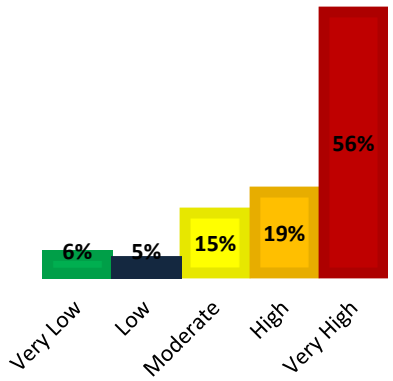
Extreme weather events have caused flooding of structures. Bridges have been submerged in the past given the high water levels. The uncertainty surrounding the impact of extreme weather events can make changing conditions difficult to plan for. These events can reduce the accessibility of the structures and the levels of service generally expected.

4.2.6 Levels of Service

The following table outlines the high-level service indicators for the Road Network: Cost, performance (condition), and risk.

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

Levels of Service Key Indicators

Cost	**Performance:** Average Condition	**Risk**
		

Community Levels of Service

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

Service Attribute	Qualitative Description	Current LOS (2020)
Scope	Description of the traffic that is supported by municipal bridges (e.g., heavy transport vehicles, motor vehicles, emergency vehicles, pedestrians, cyclists)	Bridges and structural culverts are a key component of the municipal transportation network. Magnetawan's bridges and culverts mainly support commuter traffic, and construction vehicles.. However, these bridges also support agricultural, logging and heavy gravel trucks occasionally.
Quality	Description or images of the condition of bridges & culverts and how this would affect use of the bridges & culverts	See Appendix B

Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2020)
Scope	% of bridges in the Municipality with loading or dimensional restrictions	4%
Quality	Average bridge condition index value for bridges in the Municipality	18%
	Average bridge condition index value for structural culverts in the Municipality	17%

4.2.7 Recommendations

Data Review/Validation

- Continue to review and validate inventory data and replacement costs for all bridges and structural culverts upon the completion of OSIM inspections every 2 years.
- Ensure assessed condition data is captured and updated in the inventory and used in future AMPs to better clarify the true needs of the bridge and culvert structures. Review estimated useful life values, and revise to better reflect the service life provided.

Risk Management Strategies

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

Lifecycle Management Strategies

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

Levels of Service

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

4.3 Non-Core Asset Categories

This AMP primarily focuses on core asset categories as defined in O. Reg. 588/17. The following asset categories are not considered core municipal infrastructure:

- Buildings
- Vehicles
- Land Improvements
- Machinery & Equipment

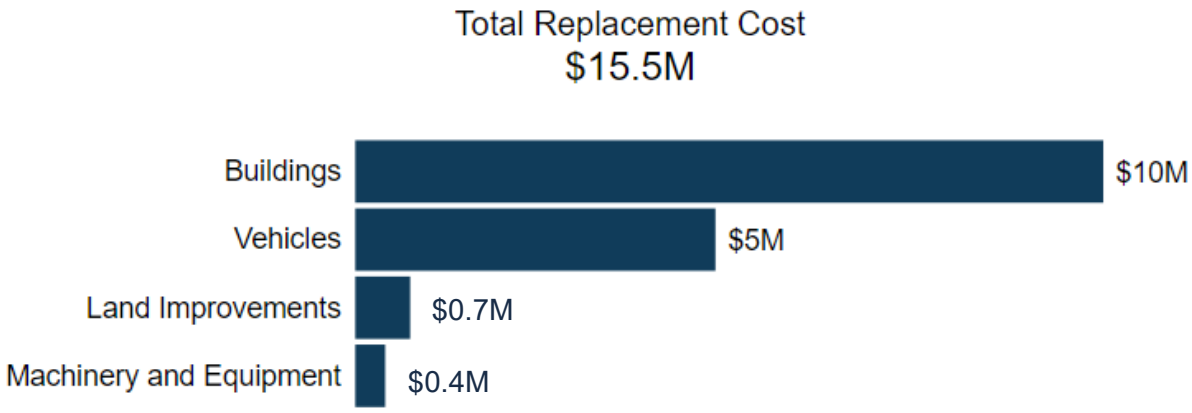
A high-level analysis of these asset categories. For most of these assets the Municipality does not currently have assessed condition data available and replacement costs are based primarily on historical cost inflation and user defined costs.

The Municipality will work towards improving data quality and meeting all requirements required prior to July 1, 2024.

4.3.1 Asset Inventory & Replacement Cost

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

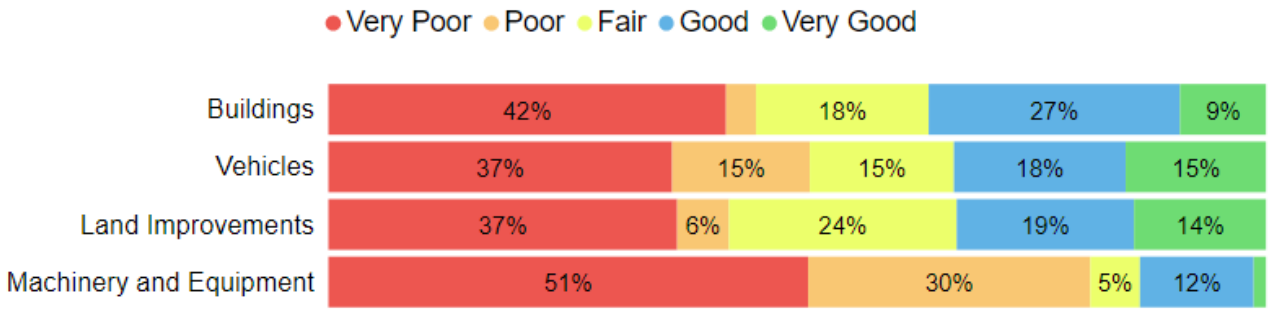
Asset Category	Quantity	Replacement Cost Method	Total Replacement Cost
Buildings	49 structures (13 components)	Cost Inflation and User Defined Cost	$9,695,564
Vehicles	37	Cost Inflation and User Defined Cost	$4,670,038
Land Improvements	30	Cost Inflation and User Defined Cost	$714,617
Machinery & Equipment	32	Cost Inflation and User Defined Cost	$390,595
			$15,470,814


Total Replacement Cost
$15.5M
Buildings
$10M
Vehicles
$5M
Land Improvements
$0.7M
Machinery and Equipment
$0.4M

4.3.2 Asset Condition

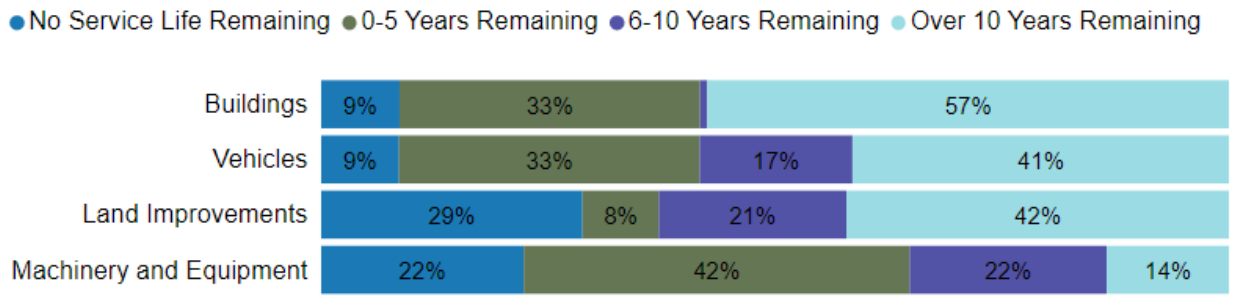
The table below identifies the current average condition and source of available condition data for each asset category. The Average Condition (%) is a weighted value based on replacement cost.

Asset Category	Average Condition (%)	Average Condition Rating	Condition Source
Buildings	39%	Poor	Age-based
Vehicles	40%	Fair	Assessed and Age-based
Land Improvements	40%	Fair	Age-based
Machinery & Equipment	24%	Poor	Assessed and Age-based
	39%	**Poor**	



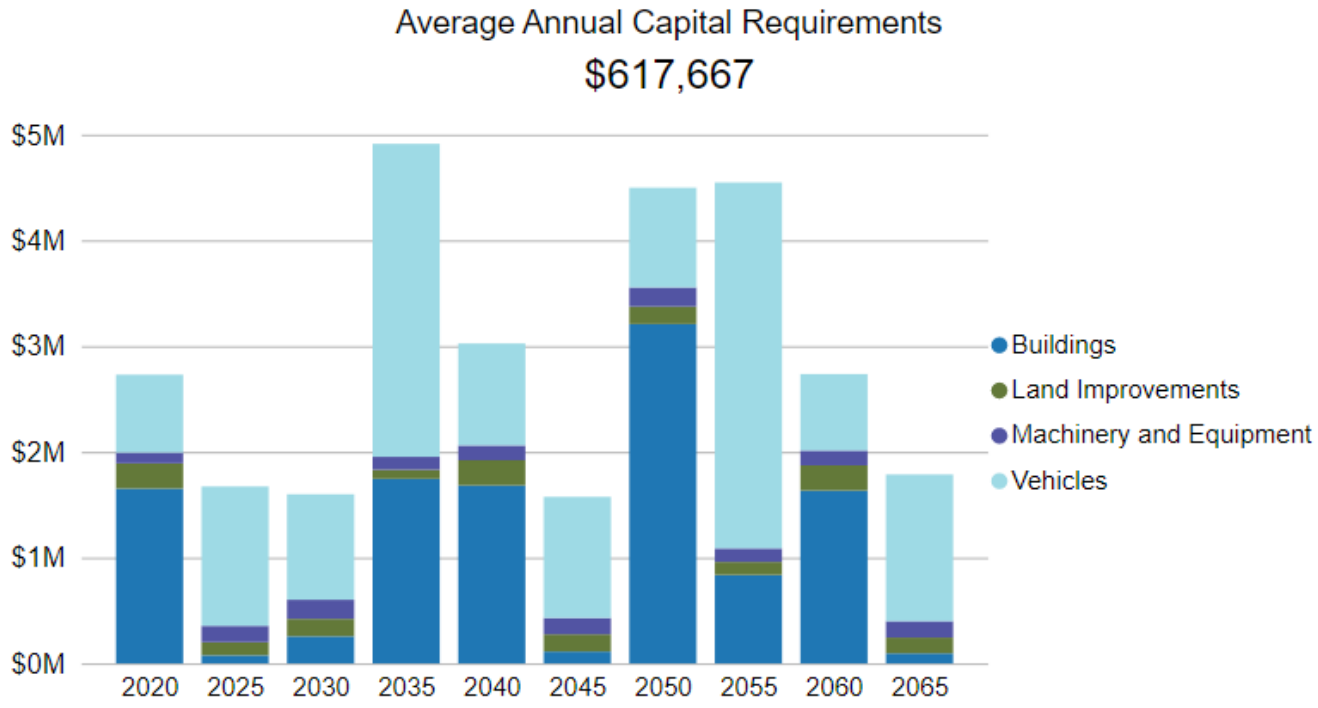
4.3.3 Estimated Useful Life & Average Age

Asset Category	Estimated Useful Life (Years)	Average Age (Years)	Average Service Life Remaining (Years)
Buildings	15-80 Years	17.1	22.5
Vehicles	8-40 Years	11.2	3.0
Land Improvements	20-40 Years	10.6	12.8
Machinery & Equipment	10-40 Years	12.2	2.4
		13.3	**11.8**



4.3.4 Forecasted Capital Requirements (Replacement Only)

Asset Category	Annual Capital Requirements
Buildings	$241,177
Vehicles	$313,425
Land Improvements	$33,067
Machinery & Equipment	$29,999
	$617,668



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 Impacts of Growth

Key Insights

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

- Population has been on the decline while 20 units are expected to be developed each year

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

5.1 Description of Growth Assumptions

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

5.1.1 Magnetawan Official Plan (July 2012)

The Municipality of Magnetawan adopted an Official Plan in 2012 to guide future development while protecting the physical and natural resources of the Municipality for their continued use and enjoyment. The Official Plan was approved by Municipal Council as of July 1st, 2012. The document planning horizon spans 20 years, covering it from 2011 to 2031.

Historically, there has been little industrial development in the Municipality. Seasonal residential and commercial development, which has been previously established along the shorelines of lakes within the Municipality, has not significantly increased in recent years.

The Plan projects permanent population of the Municipality is projected to remain relatively constant over the next decade. Projections indicate 20 units will be developed each year, over the planning horizon. These units are split evenly between residential and non-residential dwellings.

The following table outlines the population and household changes to the Municipality between 2006-2016 from Statistics Canada.

Year	Population	Total Households
2006	1,610	703
2011	1,454	574
2016	1,390	630

The Municipality is currently developing an update to the 2012 Official Plan. New population projections and changes to growth and demographics will be outlined in this document.

5.2 Impact of Growth on Lifecycle Activities

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

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

6 Financial Strategy

Key Insights

- The Municipality is committing approximately $2,205,000 towards capital projects per year from sustainable revenue sources

- Given the annual capital requirement of $2,835,000, there is currently a funding gap of $476,000 annually

- For tax-funded assets, we recommend increasing tax revenues by 0.4% each year for the next 15 years to achieve a sustainable level of funding

6.1 Financial Strategy Overview

For an asset management plan (AMP) to be effective and meaningful, it must be integrated with a long-term financial plan (LTFP).[3] The development of a comprehensive LTFP plan will allow the Municipality of Magnetawan 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 serves as a starting point for initial financial planning, specific for existing capital assets, by presenting several scenarios for consideration and culminating with final recommendations. As outlined below, the scenarios presented model different combinations of the following.

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[4]:
    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

[3] PSD understands the Municipality has not prepared a corporate-wide Long-term Financial Plan (LTFP).

[4] The sale of surplus lands, equipment or buildings were not included in the revenues for this financial strategy as they are not sustainable, nor predictable. These sources are irregular and the values can change dependent on the market or the state of the asset. However, it should be noted that the Municipality should allocate the revenues of these surplus assets to asset management to assist with the funding deficit.

one-time grant, the replacement cost included in the financial strategy is the net of such grant being received.

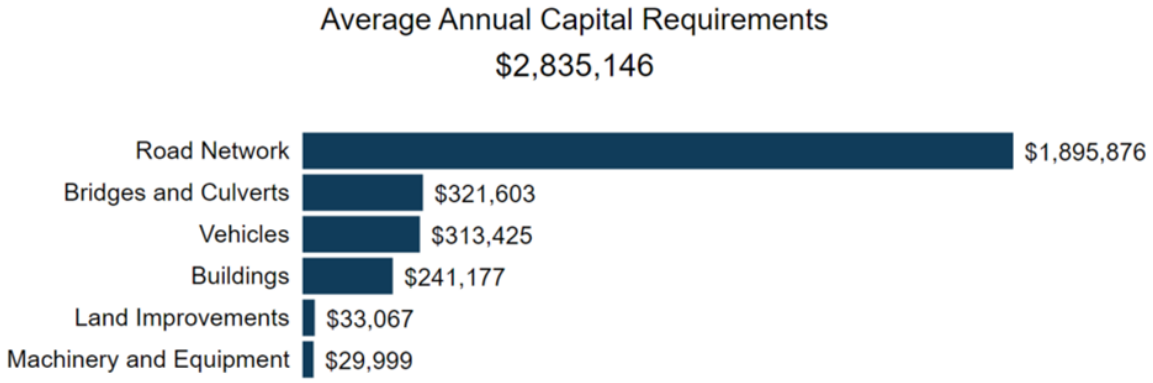
If the financial plan component shows a funding shortfall, the Province requires the Municipality to include a specific plan on how the impact of the shortfall will be managed. To determine the legitimacy of a funding shortfall, the Province may evaluate a Municipality's approach to the following:

1. Reduce the financial requirements and consider decreasing levels of service.
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.

6.1.1 Annual Requirements & Capital Funding

Annual Requirements

The annual requirements represent the amount the Municipality should allocate annually to each asset category to meet replacement needs as they arise, prevent infrastructure backlogs, and achieve long-term sustainability. In total, the Municipality must allocate approximately $2.8 million annually to address capital requirements for the assets included in this AMP.



For most asset categories[5] the annual requirement has been calculated based on a "replacement only" scenario, in which CapEx are only incurred at the construction and replacement of each asset.

However, for the Road Network, lifecycle management strategies have been developed to identify CapEx that are realized through strategic rehabilitation and renewal of the Municipality's

[5] We understand the Municipality only has tax funded assets. Therefore, this financial strategy does not include any utility infrastructure assets.

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:

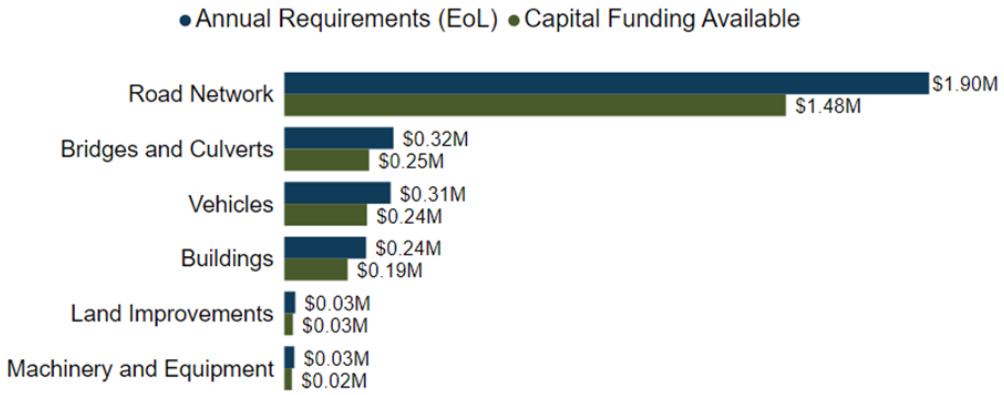
1. **Replacement Only Scenario**: Based on the assumption that assets deteriorate and – without regularly scheduled maintenance and rehabilitation – are replaced at the end of their service life.
2. **Lifecycle Strategy Scenario**: Based on the assumption that lifecycle activities are performed at strategic 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	$1,896,000	$1,248,000	$648,000

The implementation of a proactive lifecycle strategy for roads leads to a potential annual cost avoidance of $647,899 for the Road Network. This represents an overall decrease of the annual requirements by 34% respectively. However, the lifecycle strategy has not been implemented network-wide year over year. Future improvements to the asset management program should investigate refining the activity timing and costs and determine what is realistic and viable network wide. To best reflect the current strategy, an end-of-life replacement strategy for roads will be used for the financial analysis.

Annual Funding Available

Based on a historical analysis of sustainable capital funding sources, the Municipality is committing approximately $2,205,000 towards capital projects per year. Given the annual CapEx of $2,835,000, there is currently a funding gap of $476,000 annually.



6.2 Funding Objective

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

1. **Tax Funded Assets:** Road Network, Bridges & Culverts, Buildings, Machinery & Equipment, Land Improvements, Vehicles

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.

6.3 Financial Profile: Tax Funded Assets

6.3.1 Current Funding Position

The following tables show, by asset category, Magnetawan'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	
Bridges & Culverts	322,000	250,000	0	0	250,000	72,000
Buildings	241,000	187,000	0	0	187,000	54,000
Land Improvements	33,000	26,000	0	0	26,000	7,000
Machinery & Equipment	30,000	23,000	0	0	23,000	7,000
Road Network	1,896,000	1,475,000	85,000	69,000	1,629,000	267,000
Vehicles	313,000	244,000	0	0	244,000	69,000
	2,835,000	**2,205,000**	**85,000**	**69,000**	**2,359,000**	**476,000**

The average annual investment requirement for the above categories is $2.835 million. Annual revenue currently allocated to these assets for capital purposes is approximately $2.2 million. This creates a deficit of $476 thousand per year. Put differently, the infrastructure categories are currently funded at 83% of their long-term requirements.

6.3.2 Full Funding Requirements

In 2020, Municipality of Magnetawan has annual tax revenues of $5.147 million. As illustrated in the following table, without including any other sources of revenue or utilizing strategies to maintain costs, the financial requirement to fully fund the municipal CapEx would create the following tax change over time:

Asset Category	Tax Change Required for Full Funding
Bridges & Culverts	1.4%
Buildings	1.0%
Land Improvements	0.1%
Machinery & Equipment	0.1%
Road Network	5.2%
Vehicles	1.3%
	9.1%

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

a) Magnetawan's formula based OCIF grant is scheduled to go from $68,569 in 2019 to $68,544 in 2020.
b) Magnetawan's debt interest payments will be decreasing by an average of $27,000 annually for the next 5 years.

Our recommendations include utilizing the debt interest that we now have available to shrink the infrastructure deficit mentioned above. The table below outlines this recommendation and presents different timeframe 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	476,000	476,000	476,000	476,000	476,000	476,000	476,000	476,000
Change in Debt Costs	N/A	N/A	N/A	N/A	-16,000	-152,000	-152,000	-152,000
Change in OCIF Grants	N/A	N/A	N/A	N/A	0	0	0	0
Resulting Infrastructure Deficit	**476,000**	**476,000**	**476,000**	**476,000**	**460,000**	**324,000**	**324,000**	**324,000**
Tax Revenue Increase Required	9.2%	9.2%	9.2%	9.2%	8.9%	6.3%	6.3%	6.3%
Annually	**1.8%**	**0.9%**	**0.6%**	**0.5%**	**1.8%**	**0.6%**	**0.4%**	**0.3%**

6.3.3 Financial Strategy Recommendations

Considering all the above information, we recommend the 15-year option with capturing the changes. This would allow full funding of capital assets being achieved in 15 years by:

a) reallocating the previous debt interest cost to the infrastructure deficit as outlined above;
b) maintaining the debt load and loan repayment for the existing infrastructure;
c) increasing tax revenues dedicated to CapEx by approx. 0.4% each year for the next 15 years solely for the purpose of phasing in full funding to the asset categories covered in this section of the AMP;
d) allocating the government transfer revenues for capital assets as outlined previously; and
e) updating existing and future infrastructure budgets with the applicable cost of 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. Based on best practices, this periodic funding should not be incorporated into an AMP unless there are firm commitments in place. We have included the government transfer funding, as provided by the Finance Department[6].
2. We realize that raising tax revenues by the amounts recommended above for infrastructure purposes will be very difficult to do. However, a lack of intentional funding for capital assets today may have even greater consequences in terms of infrastructure failure.

Although this option reaches full funding on an annual basis in 15 years and provides financial sustainability over the period modeled, the recommendations do require the municipality to prioritize capital projects. Current data shows an investment demand of $14.150 million for the Road Network, $8.732 million for Bridges & Culverts, $807k for the Buildings, $62k for Machinery & Equipment, $27k for Land Improvements and $346k for Vehicles if the deficit is not closed.

[6] The Municipality should take advantage of all available grant funding programs and transfers from other levels of government. The financial strategy within this AMP has only included the known capital funding as provided by the Municipality's finance department, and there is an expectation the Municipality should be eligible for additional capital funding from senior governments within the next twenty years that could reduce the tax burden. Depending on the outcome of this review, there may be changes that impact its availability.

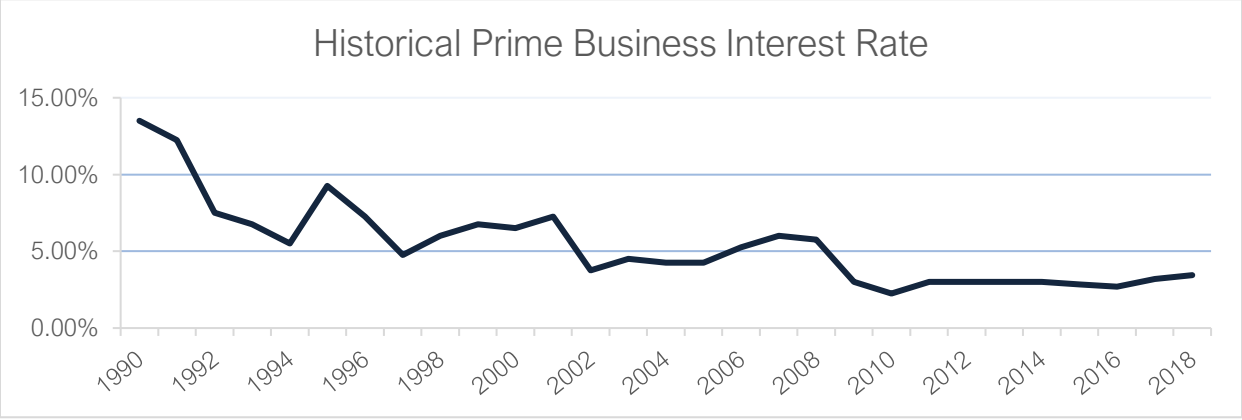
Prioritizing future projects will require the current data to be replaced by condition-based data. Although our recommendations include no borrowing, the results of the condition-based analysis may show the need to borrow in the future.

6.4 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%[7] over 15 years would result in a 26% premium or $260,000 of increased costs due to interest payments. For simplicity, the table does not consider the time value of money or the effect of inflation on delayed projects.

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

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



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

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

The following tables outline how Magnetawan has historically used debt for investing in the asset categories as listed. Currently, Magnetawan has an outstanding debt of $780,000 for a previous roads project. This debt has a corresponding principal and interest payment of $152,000, which is well within the provincially prescribed maximum of $1,402,000.

Asset Category	Current Debt Outstanding	Use of Debt in the Last Five Years				
		2015	2016	2017	2018	2019
Road Network	780,000	1,300,000	0	0	0	0
Total Rate Funded:	**780,000**	**1,300,000**	**0**	**0**	**0**	**0**

Asset Category	Principal & Interest Payments in the Next Ten Years						
	2020	2021	2022	2023	2024	2025	2030
Road Network	152,000	148,000	145,000	142,000	139,000	136,000	0
Total Tax Funded:	**152,000**	**148,000**	**145,000**	**142,000**	**139,000**	**136,000**	**0**

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

6.5 Use of Reserves

6.5.1 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 CapEx
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 Magnetawan.

Asset Category	Balance on December 31, 2020
Road Network	163,000
Bridges & Culverts	2,600,000
Buildings	773,000
Machinery & Equipment	0
Land Improvements	576,000
Vehicles	179,000
Total Tax Funded:	**4,291,000**

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

a) amount of services provided
b) age and condition of current 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 along with Magnetawan's careful use of debt in the past, now allows the Municipality to assume that available reserves and debt capacity can be used in the future. This would only be used for high priority and emergency infrastructure investments in the short- to medium-term if required.

6.5.2 Recommendation

In 2025, Ontario Regulation 588/17 will require Magnetawan to integrate proposed levels of service for all asset categories in its asset management plan. We recommend that the asset management planning in the near future should show adjustments to service levels and the impacts these service levels will have on reserve balances.

7 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
Paved Roads (HCB)	$0	$0	$0	$0	$0	$0	$0	$0	$240,000	$0	$0
Paved Roads (LCB)	$595,000	$0	$0	$0	$0	$350,000	$0	$490,000	$1,704,500	$10,941,000	$3,535,000
Guardrails	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Sidewalks	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Streetlights	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$137,276
	$595,000	$0	$0	$0	$0	$350,000	$0	$490,000	$1,944,500	$10,941,000	$3,672,276

Bridges & Culverts											
Asset Segment	Backlog	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Bridges	$5,995,610	$2,026,935	$0	$0	$0	$0	$0	$0	$0	$0	$0
Culverts	$2,735,986	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	$8,731,595	**$2,026,935**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**

Buildings											
Asset Segment	Backlog	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Administration	$0	$0	$0	$1,186,327	$0	$0	$0	$0	$0	$0	$0
Environmental Services	$0	$0	$7,005	$0	$0	$11,402	$0	$0	$0	$0	$0
Fire	$111,513	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Parks and Recreation	$695,867	$31,649	$0	$416,861	$0	$0	$0	$0	$0	$76,737	$0
Public Works	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	$807,380	**$31,649**	**$7,005**	**$1,603,189**	**$0**	**$11,402**	**$0**	**$0**	**$0**	**$76,737**	**$0**

Machinery & Equipment											
Asset Segment	Backlog	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Administration	$0	$0	$4,418	$0	$0	$0	$0	$0	$0	$0	$0
Fire	$21,683	$0	$0	$20,016	$8,301	$6,827	$20,638	$0	$0	$0	$0
Other	$9,454	$0	$0	$0	$0	$7,281	$0	$0	$0	$0	$0
Parks	$8,621	$24,693	$0	$0	$0	$0	$0	$0	$0	$0	$0
Recreation	$22,730	$0	$0	$0	$12,545	$0	$0	$0	$0	$55,961	$0
Roads Equipment	$0	$0	$0	$0	$4,330	$14,092	$12,058	$0	$0	$0	$3,771
	$62,489	**$24,693**	**$4,418**	**$20,016**	**$25,177**	**$28,200**	**$32,696**	**$0**	**$0**	**$55,961**	**$3,771**

Vehicles											
Asset Segment	Backlog	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Environmental Services Vehicles	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$168,004
Fire Vehicles	$191,137	$6,096	$0	$0	$0	$445,000	$0	$0	$520,000	$139,860	$0
Parks Vehicles	$154,773	$49,916	$4,638	$0	$0	$0	$0	$0	$0	$124,964	$4,638
Road Vehicles	$0	$0	$0	$0	$0	$230,724	$0	$57,866	$2,103	$245,513	$0
	$345,910	**$56,011**	**$4,638**	**$0**	**$0**	**$675,724**	**$0**	**$57,866**	**$522,103**	**$510,337**	**$172,643**

Land Improvements											
Asset Segment	Backlog	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Fencing	$0	$0	$0	$0	$0	$0	$0	$0	$9,159	$19,081	$0
Parks	$27,367	$0	$0	$29,611	$0	$8,874	$0	$0	$0	$0	$0
Paving & Parking Lots	$0	$178,429	$0	$0	$0	$21,511	$0	$0	$0	$11,182	$18,269
Waste Management	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$66,164
	$27,367	**$178,429**	**$0**	**$29,611**	**$0**	**$30,385**	**$0**	**$0**	**$9,159**	**$30,263**	**$84,433**

All Asset Categories											
Asset Category	Backlog	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Bridges & Culverts	$8,731,595	$2,026,935	$0	$0	$0	$0	$0	$0	$0	$0	$0
Buildings	$807,380	$31,649	$7,005	$1,603,189	$0	$11,402	$0	$0	$0	$76,737	$0
Land Improvements	$27,367	$178,429	$0	$29,611	$0	$30,385	$0	$0	$9,159	$30,263	$84,433
Machinery & Equipment	$62,489	$24,693	$4,418	$20,016	$25,177	$28,200	$32,696	$0	$0	$55,961	$3,771
Road Network	$595,000	$0	$0	$0	$0	$350,000	$0	$490,000	$1,944,500	$10,941,000	$3,672,276
Vehicles	$345,910	$56,011	$4,638	$0	$0	$675,724	$0	$57,866	$522,103	$510,337	$172,643
	$10,569,741	**$2,317,717**	**$16,061**	**$1,652,816**	**$25,177**	**$1,095,711**	**$32,696**	**$547,866**	**$2,475,762**	**$11,614,298**	**$3,933,123**

Appendix B: Level of Service Maps

Images of Bridge in Fair Condition
Lot 66, Conc A/B, Spence Bridge (Bridge 4)
Inspected: October 22nd, 2019


Looking East


Soffit

Northwest Girder

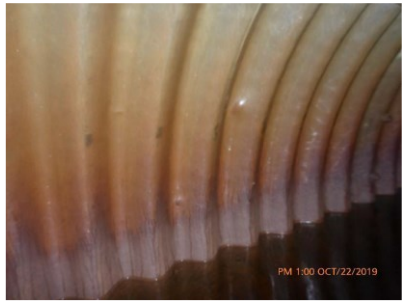

South Elevation

Images of Culvert in Good Condition
Lot 10/11, Conc X, Chapman Culvert (Culvert 19)
Inspected: October 22nd, 2019


West Elevation

East End of Barrel

Looking East through Barrel



North Wall at Midspan Barrel

Appendix C: Risk Rating Criteria

Probability of Failure

Asset Category	Risk Criteria	Criteria Weighting	Value/Range	Probability of Failure Score
Bridges & Culverts	Condition	80%	80-100	1
			60-79	2
			40-59	3
			20-39	4
			0-19	5
	Structure Type	20%	Concrete Bridge	1
			Concrete Box Culvert	2
			Steel Multi-Plate	3
			Wooden Bridge	4
Road Network (Roads)	Condition	100%	80-100	1
			60-79	2
			40-59	3
			20-39	4
			0-19	5

Consequence of Failure

Asset Category	Risk Classification	Risk Criteria	Value/Range	Consequence of Failure Score
Bridges & Culverts	Economic (70%)	Replacement Cost (100%)	$0-$100,000	1
			$100,000-$300,000	2
			$300,000-$600,000	3
			$600,000-$1,000,000	4
			$1,000,000+	5
	Social (30%)	AADT	0-50	1
			51-100	2
			101-150	3
			151-200	4
			200+	5
Road Network	Economic (100%)	AMP Segment	LCB Roads	2
			HCB Roads	4

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

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

Role of Asset Condition Data

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

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

Guidelines for Condition Assessment

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

Condition assessments must include a quantitative or qualitative assessment of the current condition of the asset, collected according to specified condition rating criteria, in a format that can be used for asset management decision-making. As a result, it is important that staff adequately define the condition rating criteria that should be used and the assets that require a discrete condition rating. When engaging with external consultants to complete condition assessments, it is critical that these details are communicated as part of the contractual terms of the project.

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

Developing a Condition Assessment Schedule

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

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