Asset Management Plan

Town of Gravenhurst

2022

This Asset Management Plan was prepared by:

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

Key Statistics

Replacement cost of asset portfolio
$275.2 million

Replacement cost of infrastructure per household
$33,271 (2021)

Percentage of assets in fair or better condition
78%

Percentage of assets with assessed condition data
81%

Annual capital infrastructure deficit
$2.3 million

Recommended timeframe for eliminating annual infrastructure deficit
5 Years

Target reinvestment rate
3.41%

Actual reinvestment rate
2.57%

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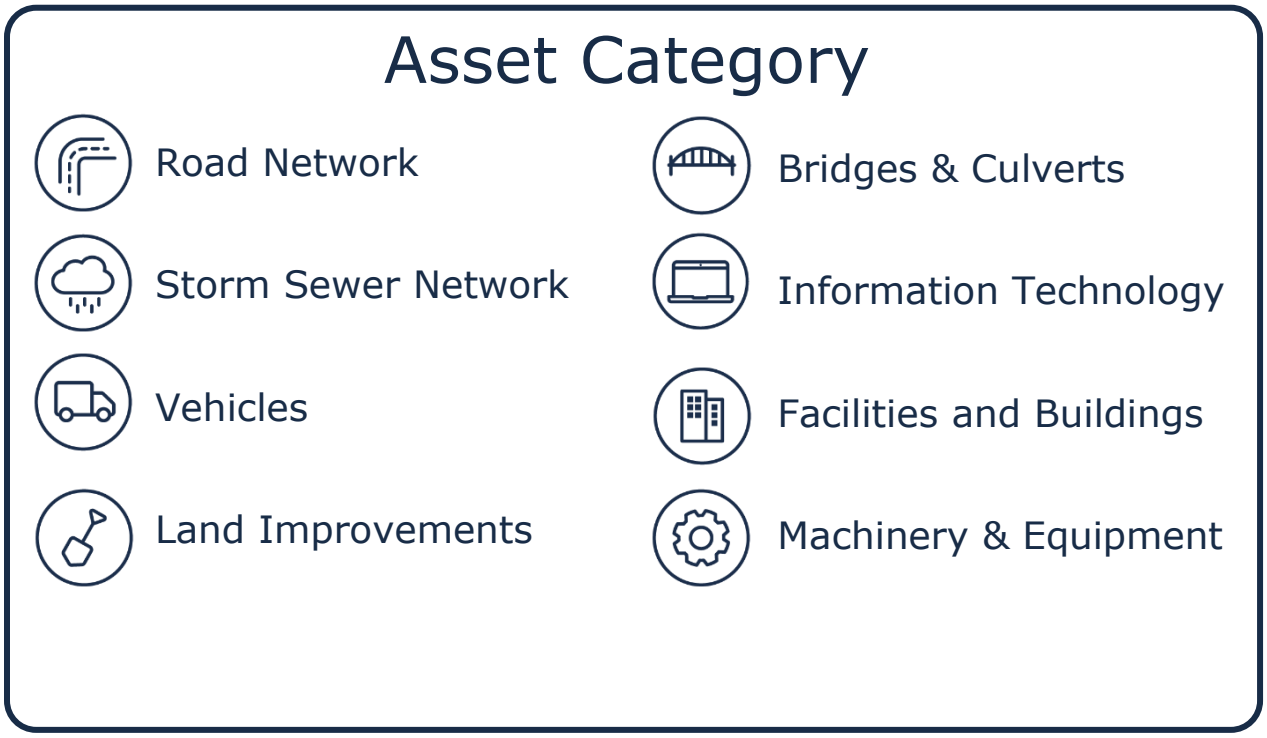
Executive Summary

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

Scope

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

Findings

The overall replacement cost of the asset categories included in this AMP totals $275.2 million. 78% of all assets analysed in this AMP are in fair or better condition and assessed condition data was available for 81% of assets. For the remaining 19% of assets, assessed condition data was unavailable, and asset age was used to approximate condition – a data gap that persists in most municipalities. Generally, age misstates the true condition of assets, making assessments essential to accurate asset management planning, and a recurring recommendation in this AMP.
The development of a long-term, sustainable financial plan requires an analysis of whole lifecycle costs. This AMP uses a combination of proactive lifecycle strategies (roads, bridges, and culverts) 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 Town's average annual capital requirement totals $9.4 million. Based on a historical analysis of sustainable capital funding sources, the Town is committing approximately $7.1 million towards capital projects or reserves per year. As a result, there is currently an annual funding gap of $2.3 million.

It is important to note that this AMP represents a snapshot in time and is based on the best available processes, data, and information at the Town. 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/rate change required to eliminate the Town's infrastructure deficit based on a 5-year plan:

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

- Review data to update and maintain a complete and accurate dataset
- Develop a condition assessment strategy with a regular schedule
- Review and update lifecycle management strategies
- Development and regularly review short- and long-term plans to meet capital requirements
- Measure current levels of service and identify sustainable proposed levels of service

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

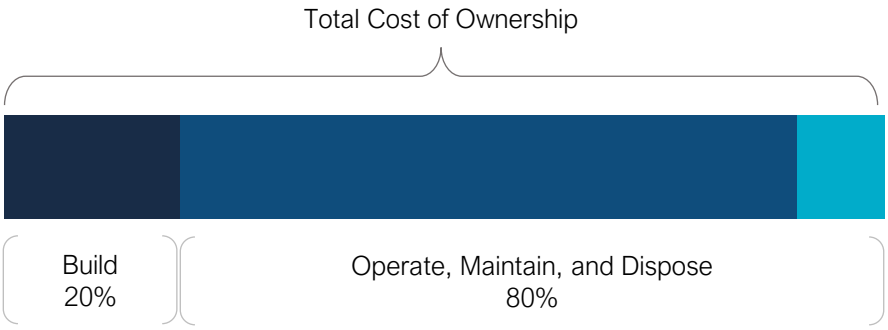
- An asset management plan is a living document that should be updated regularly to inform long-term planning

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

1.1An 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 Town'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 Town adopted Policy No. A09-STR in accordance with Ontario Regulation 588/17.

The objectives of the policy include:

- Fiscal Responsibilities
- Delivery of Services/Programs
- Public Input/Council Direction
- Risk/Impact Mitigation

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 Town plans to achieve asset management objectives through planned activities and decision-making criteria.
The Town'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 Town'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 Town to re-evaluate the state of infrastructure and identify how the organization's asset management and financial strategies are progressing.

1.2Key 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 Town'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 Town 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 Town as worth measuring and evaluating. The Town 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 and culverts, water, wastewater, storm sewer) 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 Town 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 Town'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 and culverts, water, wastewater, storm sewer) 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 Town has determined the technical metrics that will be used to determine the technical level of service provided. These metrics can be found in the Levels of Service subsection within each asset category.

Current and Proposed Levels of Service

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

1.3Ontario Regulation 588/17

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

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

2019

Strategic Asset Management Policy

2022

Asset Management Plan for Core Assets with the following components:

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

2024

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

2025

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

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

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, 2024. Next to each requirement a page or section reference is included in addition to any necessary commentary.

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

2 Scope and Methodology

Key Insights

- This asset management plan includes 8 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

2.1Asset Categories Included in this AMP

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

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

Asset Category	Source of Funding
Road Network	Tax Levy
Bridges & Culverts	
Storm Sewer Network	
Facilities and Buildings	
Vehicles	
Machinery & Equipment	
Information Technology	
Land Improvements	

2.2Deriving 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 Town 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 Town 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 Town can determine the service life remaining (SLR) for each asset. Using condition data and the asset's SLR, the Town 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 Town can determine the extent of any existing funding gap. The reinvestment rate is calculated as follows:

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

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

2.5Deriving 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 Town'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.

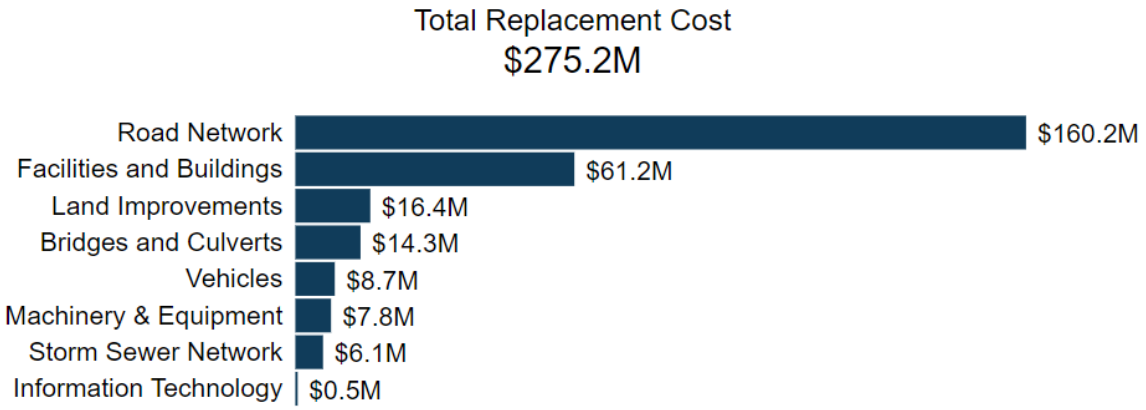
3 Portfolio Overview

Key Insights

- The total replacement cost of the Town's asset portfolio is $275 million
- The Town's target re-investment rate is 3.41%, and the actual re-investment rate is 2.57%, contributing to an expanding infrastructure deficit
- 79% of all assets are in fair or better condition
- 52% of assets are projected to require replacement in the next 10 years
- Average annual capital requirements total $9.4 million per year across all assets

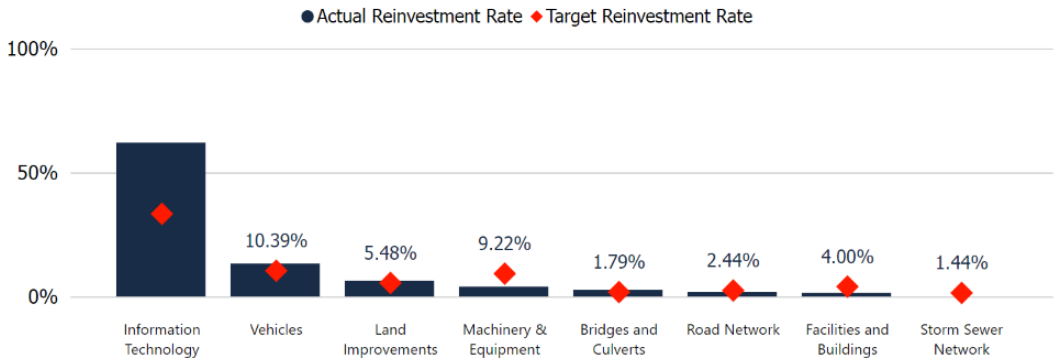
3.1Total Replacement Cost of Asset Portfolio

The asset categories analyzed in this AMP have a total replacement cost of $275 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.



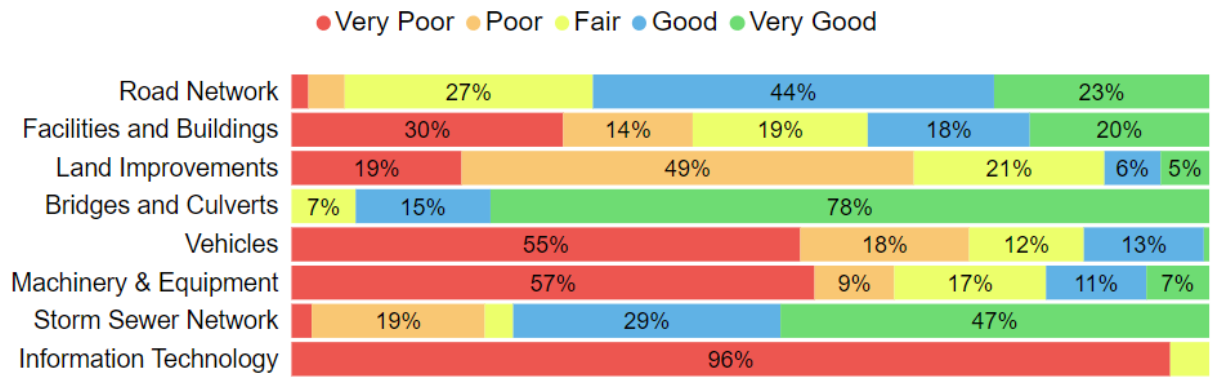
3.2Target vs. Actual Reinvestment Rate

The graph below depicts funding gaps or surpluses by comparing target vs actual reinvestment rate. To meet the long-term replacement needs, the Town should be allocating approximately $9.4 million annually, for a target reinvestment rate of 3.41%. Actual annual spending on infrastructure totals approximately $7.1 million, for an actual reinvestment rate of 2.57%.



3.3Condition of Asset Portfolio

The current condition of the assets is central to all asset management planning. Collectively, 79% of assets in Gravenhurst are in fair or better condition, which is a good indication. This estimate relies on both age-based and field condition data.

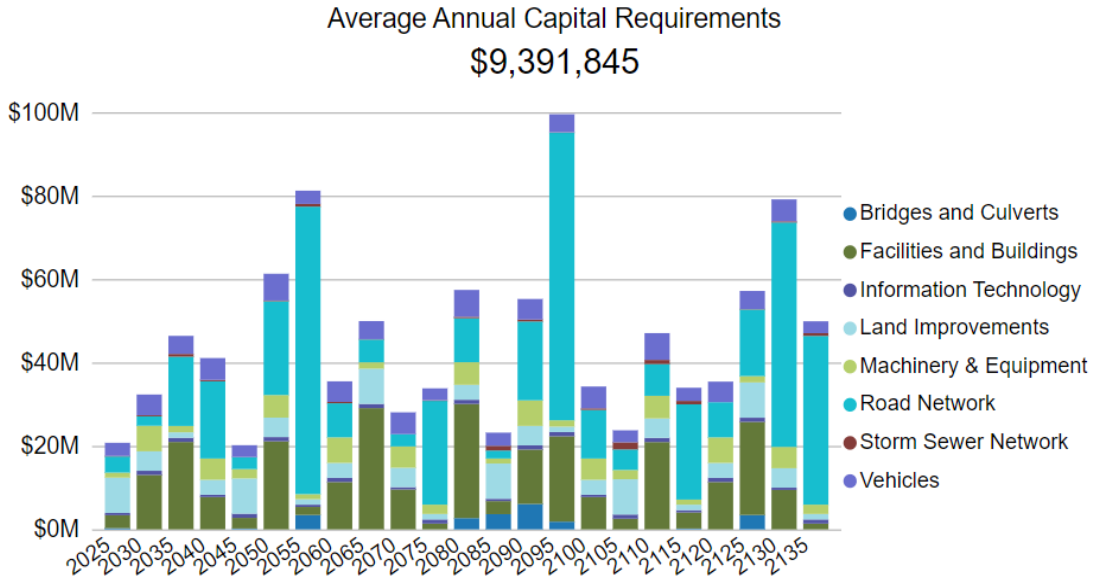


This AMP relies on assessed condition data for 81% of assets which is a good indication; for the remaining portfolio, age is used as an approximation of condition. Assessed condition data is invaluable in asset management planning as it reflects the true condition of the asset and its ability to perform 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	Roads	100%	2021 Road Needs Study
Bridges & Culverts	Bridges	100%	2021 Bridge Needs Study
	Structural Culverts	95%	2021 Bridge Needs Study
Storm Sewer Network	All	0%	Age-based
Facilities and Buildings	All	21%	2017 Facilities Assessment
Machinery & Equipment	All	0%	Age-based
Vehicles	All	0%	Age-based
Land Improvements	All	0%	Age-based
Information Technology	All	0%	Age-based

3.4Forecasted 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 Town can produce an accurate long-term capital forecast. The following graph identifies capital requirements over the next 115 years. This projection is used as it ensures that every asset has gone through one full iteration of replacement. The forecasted requirements are aggregated into 5-year bins.



4 Analysis of Tax-funded Assets

Key Insights

- Tax-funded assets are valued at $275 million
- 7% 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 $9.4 million
- Critical assets should be evaluated to determine appropriate risk mitigation activities and treatment options

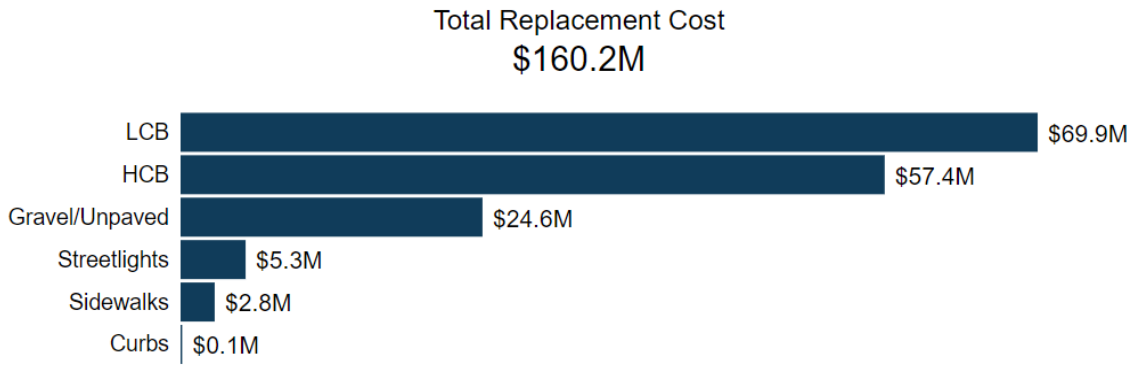
4.1Road Network

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

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 Town's Road network inventory.

Asset Segment	Quantity	Replacement Cost Method	Total Replacement Cost
Curbs	3 (count)	User-Defined Cost	$130,080
Gravel/Unpaved	57.94 (kms)	User-Defined Cost	$24,631,112
HCB	79.704 (kms)	User-Defined Cost	$57,441,177
LCB	111.52 (kms)	User-Defined Cost	$69,920,901
Sidewalks	34,203 (m^2)	User-Defined Cost	$2,783,757
Streetlights	1,068 (count)	User-Defined Cost	$5,306,151
			$160,213,177



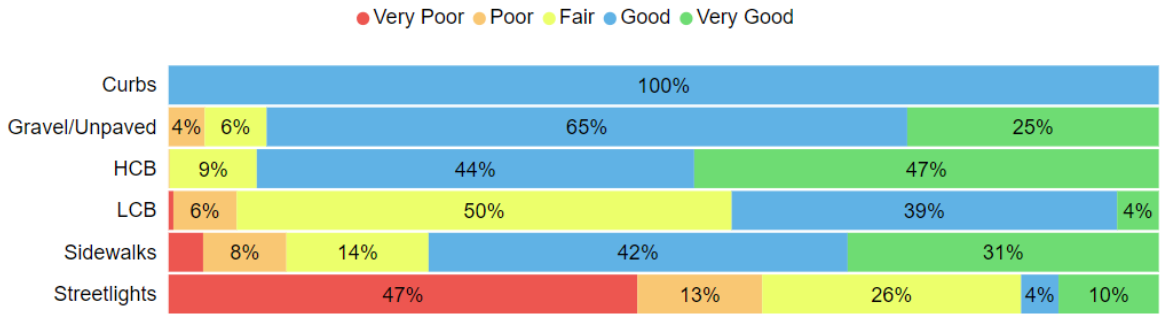
Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to more accurate represent realistic capital requirements.

4.1.2 Asset Condition

The 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
Curbs	62%	Good	Age-Based
Gravel/Unpaved	72%	Good	100% Assessed
HCB	79%	Good	100% Assessed
LCB	57%	Fair	100% Assessed
Sidewalks	68%	Good	Age-Based
Streetlights	29%	Poor	Age-Based
	67%	**Good**	**95% Assessed**

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



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

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 Town's current approach:

- A Road Needs Study was completed in 2021 that included a detailed assessment of the condition of each road segment
- The Road Needs Study is completed every 5 years by external contractors.
- Road patrols are completed by internal staff based on the minimum maintenance standards defined for different road classes

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)
Curbs	40	15.1	24.9
Gravel/Unpaved	5-20	6.5	27.1
HCB	5-20	13.5	14.1
LCB	5-20	12.8	7.4
Sidewalks	40	14.4	25.7
Streetlights	20	6.1	13.8
		9.6	**15.2**

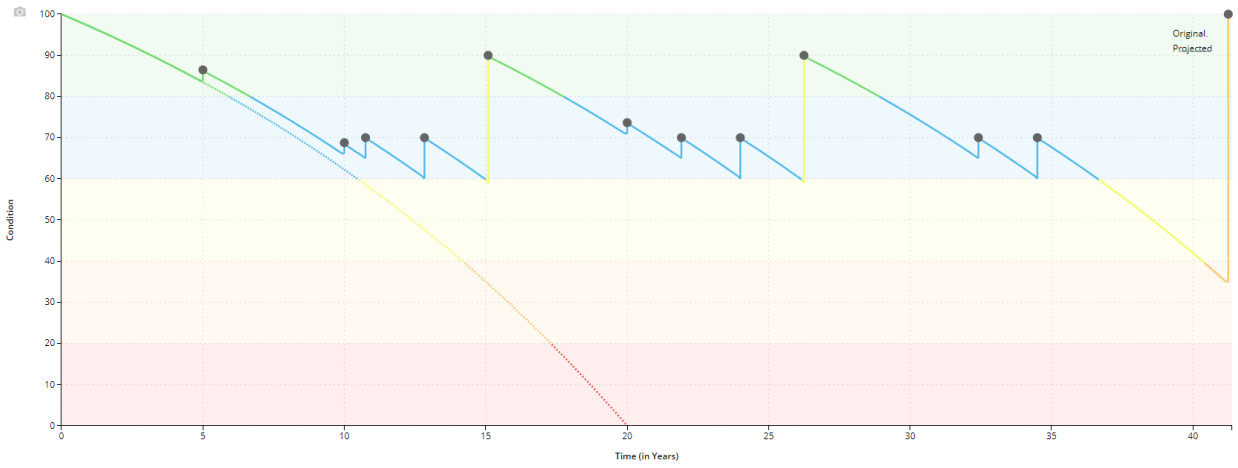
Each asset's Estimated Useful Life should be reviewed periodically to determine whether adjustments need to be made to better align with the observed length of service life for each asset type.

4.1.4 Lifecycle Management Strategy

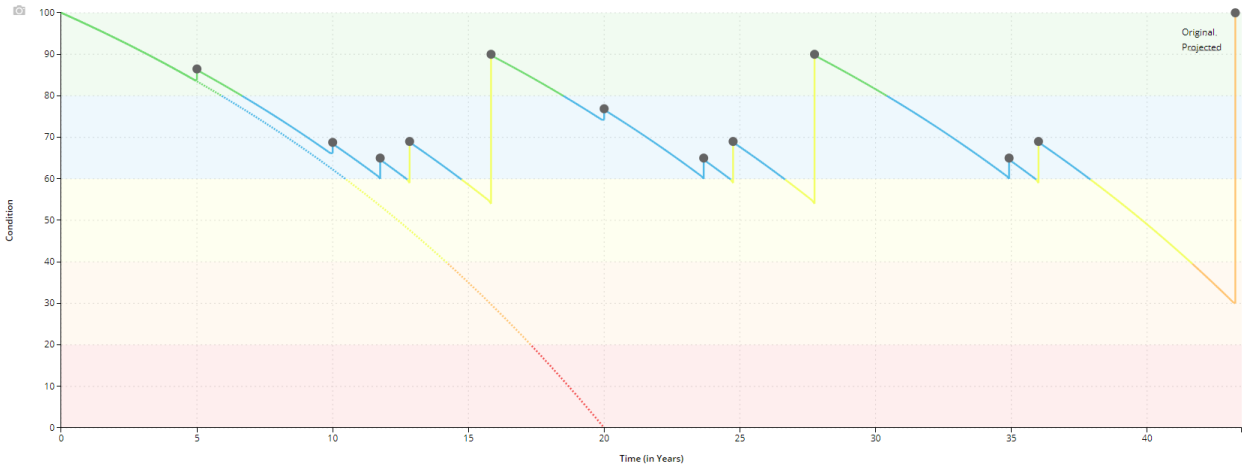
The condition or performance of most assets will deteriorate over time. This process is affected by a range of factors including an asset's characteristics, location, utilization, maintenance history and environment.

The following lifecycle strategies have been developed as a proactive approach to managing the lifecycle of LCB, HCB and gravel 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.

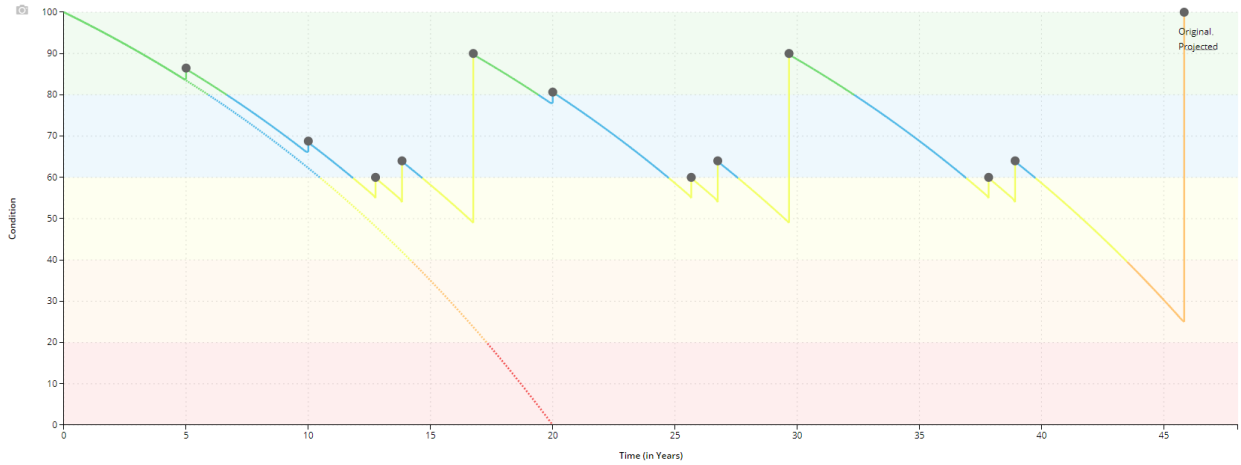
Paved Roads (HCB Arterial)		
Event Name	**Event Class**	**Event Trigger**
Asphalt Overlay	Maintenance	59 Condition
Crack Seal (#1)	Maintenance	5 Years
Crack Seal (#2)	Maintenance	10 Years
Crack Seal (#3)	Maintenance	20 Years
Micro-Surfacing	Maintenance	60 Condition
Patch Repair	Maintenance	65 Condition
Pulverize (Pre-Pave)	Rehabilitation	59 Condition
Full Reconstruction	Replacement	35-50 Condition



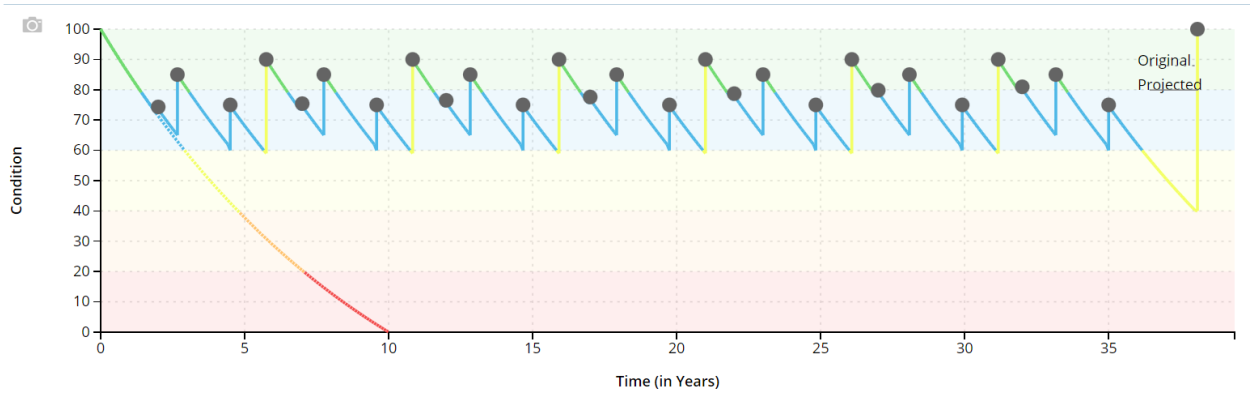
Paved Roads (HCB Collector)		
Event Name	**Event Class**	**Event Trigger**
Asphalt Overlay	Maintenance	54 Condition
Crack Seal (#1)	Maintenance	5 Years
Crack Seal (#2)	Maintenance	10 Years
Crack Seal (#3)	Maintenance	20 Years
Micro-Surfacing	Maintenance	59 Condition
Patch Repair	Maintenance	60 Condition
Pulverize (Pre-Pave)	Rehabilitation	54 Condition
Full Reconstruction	Replacement	30-45 Condition



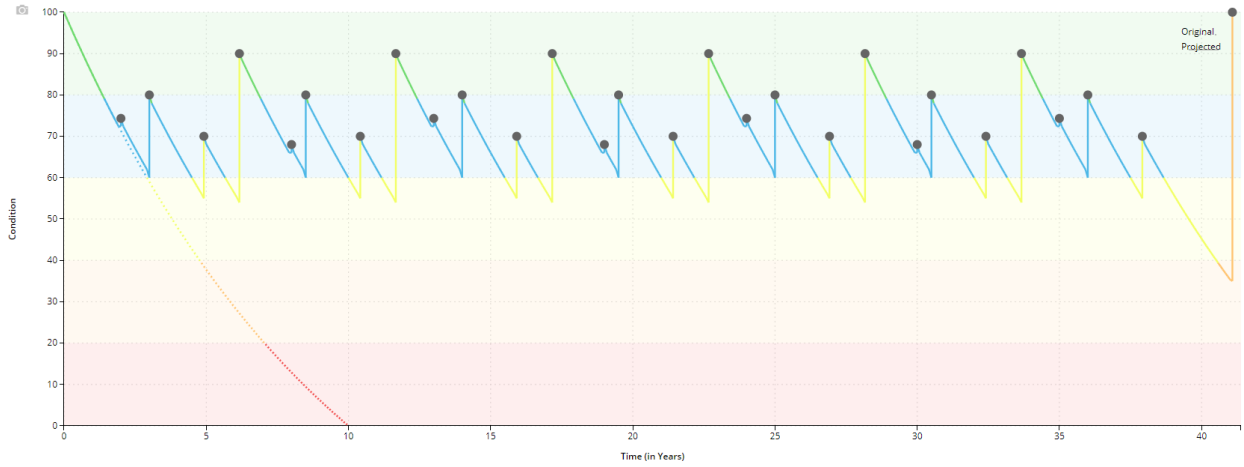
Paved Roads (HCB Local)		
Event Name	**Event Class**	**Event Trigger**
Asphalt Overlay	Maintenance	49 Condition
Crack Seal (#1)	Maintenance	5 Years
Crack Seal (#2)	Maintenance	10 Years
Crack Seal (#3)	Maintenance	20 Years
Micro-Surfacing	Maintenance	54 Condition
Patch Repair	Maintenance	55 Condition
Pulverize (Pre-Pave)	Rehabilitation	49 Condition
Full Reconstruction	Replacement	25-40 Condition



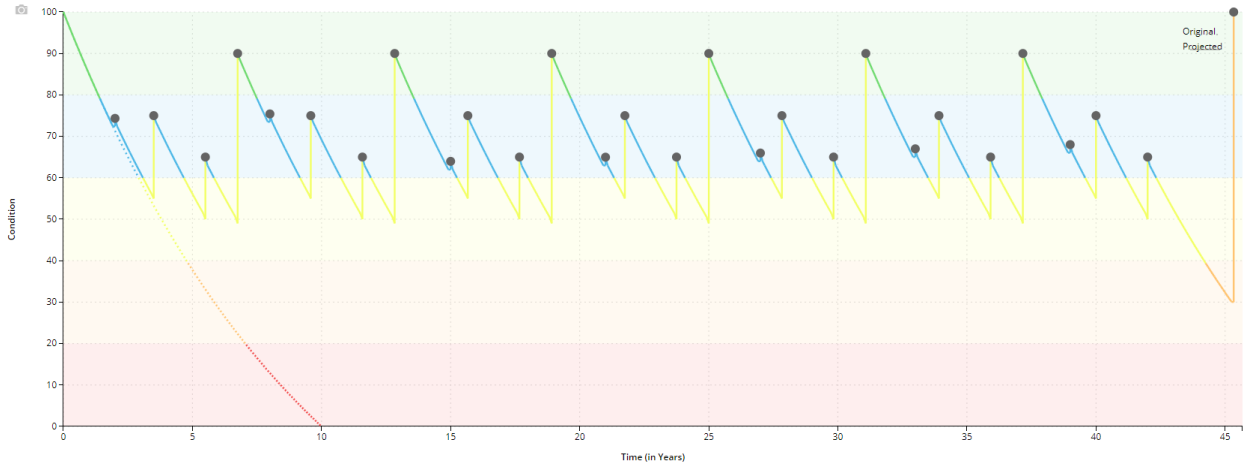
Paved Roads (LCB Arterial)		
Event Name	**Event Class**	**Event Trigger**
Cold Mix Patch	Maintenance	60 to 65 Condition
Double Surface Treatment	Rehabilitation	59 Condition
Pulverize (Pre-Pave)	Rehabilitation	59 Condition
Slurry Seal (#1)	Maintenance	2 Years
Slurry Seal (#2)	Maintenance	7 Years
Slurry Seal (#3)	Maintenance	12 Years
Slurry Seal (#4)	Maintenance	17 Years
Slurry Seal (#5)	Maintenance	22 Years
Slurry Seal (#6)	Maintenance	27 Years
Slurry Seal (#7)	Maintenance	32 Years
Spray Patch	Maintenance	60 Condition
Full Reconstruction	Replacement	40 Condition



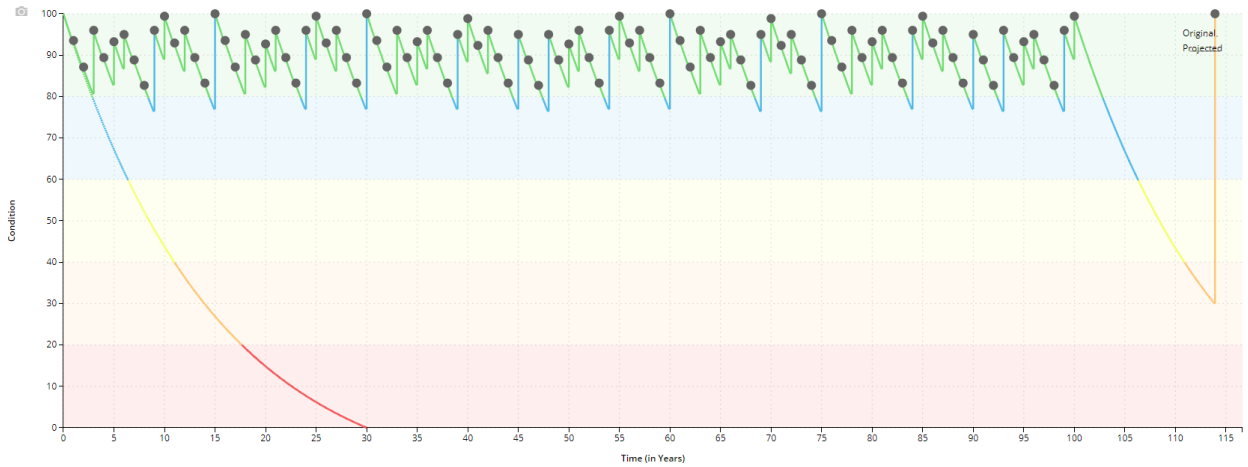
Paved Roads (LCB Collector)		
Event Name	**Event Class**	**Event Trigger**
Cold Mix Patch	Maintenance	60 Condition
Double Surface Treatment	Rehabilitation	54 Condition
Pulverize (Pre-Pave)	Rehabilitation	54 Condition
Slurry Seal (#1)	Maintenance	2 Years
Slurry Seal (#2)	Maintenance	8 Years
Slurry Seal (#3)	Maintenance	13 Years
Slurry Seal (#4)	Maintenance	19 Years
Slurry Seal (#5)	Maintenance	24 Years
Slurry Seal (#6)	Maintenance	30 Years
Slurry Seal (#7)	Maintenance	35 Years
Spray Patch	Maintenance	55 Condition
Full Reconstruction	Replacement	35 Condition



Paved Roads (LCB Local)		
Event Name	**Event Class**	**Event Trigger**
Cold Mix Patch	Maintenance	55 Condition
Double Surface Treatment	Rehabilitation	49 Condition
Pulverize (Pre-Pave)	Rehabilitation	49 Condition
Slurry Seal (#1)	Maintenance	2 Years
Slurry Seal (#2)	Maintenance	8 Years
Slurry Seal (#3)	Maintenance	15 Years
Slurry Seal (#4)	Maintenance	21 Years
Slurry Seal (#5)	Maintenance	27 Years
Slurry Seal (#6)	Maintenance	33 Years
Slurry Seal (#7)	Maintenance	39 Years
Spray Patch	Maintenance	50 Condition
Full Reconstruction	Replacement	30 Condition



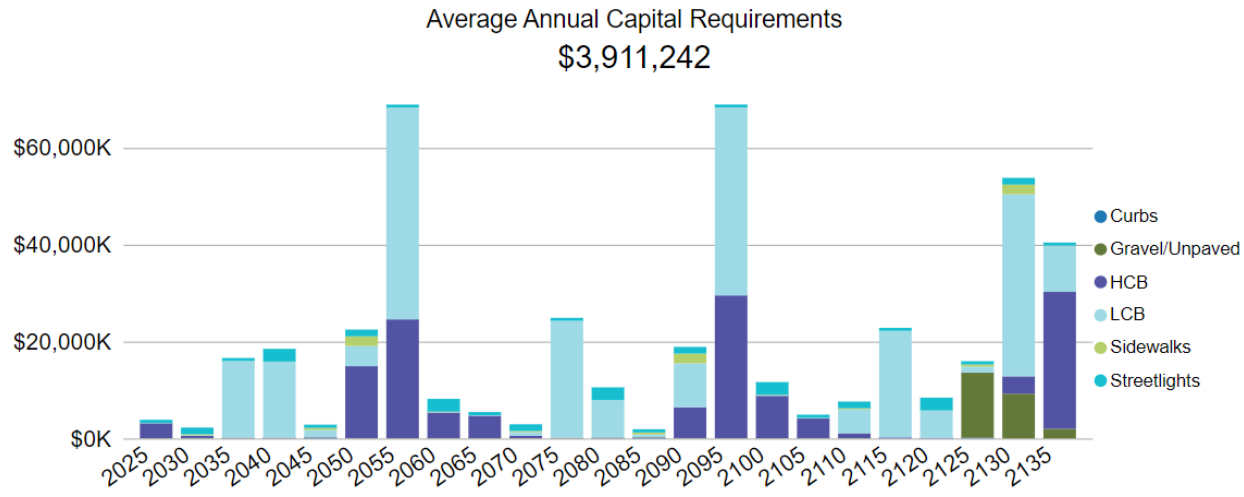
Gravel Roads		
Event Name	**Event Class**	**Event Trigger**
Dust Control	Maintenance	1 Year (Repeating)
Grading	Maintenance	1 Year (Repeating)
Maintenance Gravel	Maintenance	3 Years (Repeating)
Spot Gravel	Maintenance	5 Years (Repeating)
Full Reconstruction	Replacement	Condition



Forecasted Capital Requirements

Based on the lifecycle strategies identified previously for HCB, LCB, and gravel 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 following graph forecasts long-term capital requirements. The annual capital requirement represents the average amount per year that the Town should allocate towards funding rehabilitation and replacement needs. The following graph identifies capital requirements over the next 115 years. This projection is used as it ensures that every asset has gone through one full iteration of replacement. The forecasted requirements are aggregated into 5-year bins.

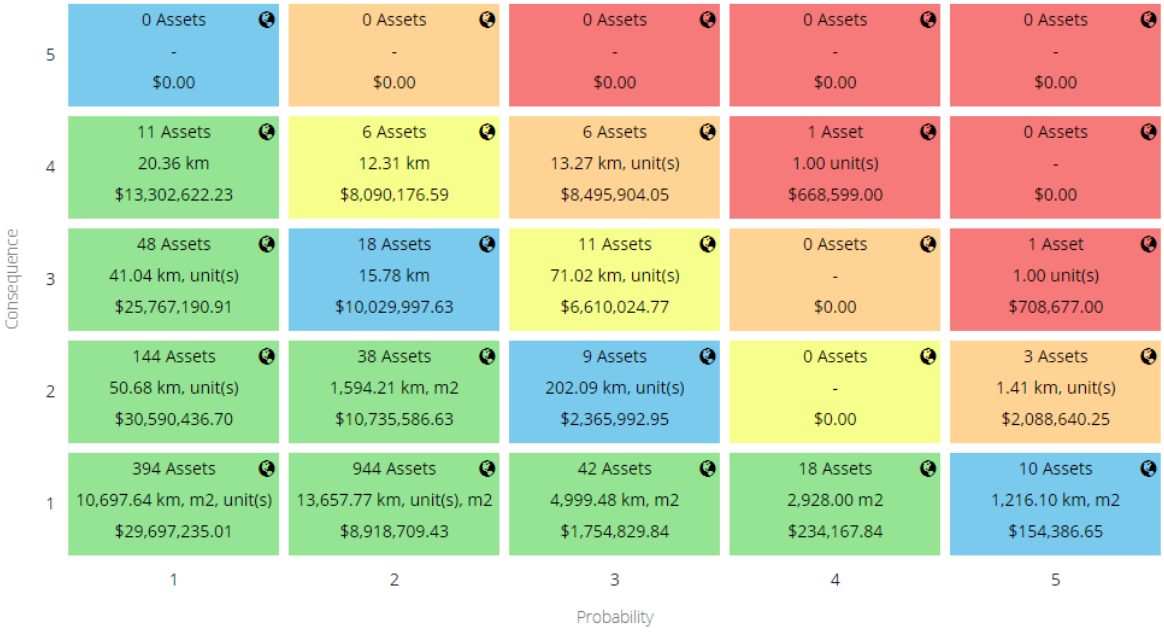


The projected cost of lifecycle activities that will need to be undertaken over the next 10 years to maintain the current level of service can be found in Appendix A.

4.1.5 Risk & Criticality

Risk Matrix

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



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

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

Probability of Failure (POF)	Consequence of Failure (COF)
Condition (Economic)	Replacement Cost (Financial)
Pavement Comfort Rating - PCR (Social)	
2021 Utilization (Social)	2021 Average Daily Traffic Counts (Operational)
Drainage Adequacy (Environmental)	

The identification of critical assets allows the Town to determine appropriate risk mitigation strategies and treatment options. Risk mitigation may include asset-

specific lifecycle strategies, condition assessment strategies, or simply the need to collect better asset data.

Risks to Current Asset Management Strategies

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

Climate Change & Extreme Events

The betterment strategies that the town has previously employed on the road network have not been as effective as predicted in recent years due to extreme weather events and the advent of climate change. Considering the unpredictable nature of extreme weather events, it is difficult to determine the impact that betterment strategies will have on the road network.

Capital Funding Strategies

The town is experiencing difficulty in deciding how to most effectively allocate capital funding. Competing new community wants and needs are arising which can often be expensive. Utilizing capital funds to address these community needs is preventing the town from being able to complete all lifecycle management strategies on major assets such as roads bridges, and storm sewer networks due to budget constraints.

4.1.6 Levels of Service

The following tables identify the Town'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 Town 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 (2021)
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 Town completed a Road Needs Study in October 2021 in coordination with Tatham Engineering. Every road section received a pavement condition index, rating the condition of the surface of the road on a scale of 0-100. (0-50) Road surface exhibits moderate to significant deterioration and requires reconstruction or rehabilitation immediately (50-75) Road surface is in fair condition. Resurfacing will be required in the next 1-5 years. (75-85) Road surface is in good condition. Resurfacing will be required in the next 6-10 years. (85-100) Road surface condition is very good. No road needs have been identified in the next 10 years.

Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2021)
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)	0.34
	Lane-km of local roads (MMS classes 5 and 6) per land area (km/km^2)	1.15
Quality	Average pavement condition index for paved roads in the municipality	HCB: 79% LCB: 57%
	Average surface condition for unpaved roads in the municipality (e.g. excellent, good, fair, poor)	Good
	% of sidewalks inspected	100%
	% of road network inspected	100%
	% of streetlights converted to LED	90%
	% of signs meeting retro reflectivity requirements	98%
Performance	Capital reinvestment rate	1.82%

4.1.7 Recommendations

Asset Inventory

- Review roads and supporting infrastructure inventory to determine whether all municipal assets within these asset segments have been accounted for through maintaining the frequency of the assessments.
- Adopt a review cycle to update the replacement costs with recent market pricing. This review cycle can be aligned with the Road Needs Studies or updated whenever receiving new market pricing through tenders and quotes.

Condition Assessment Strategies

- Maintain the current assessment frequency and attributes such as the adjusted Pavement Condition Index, Riding Comfort, Utilization Rates, and Drainage Adequacy

Lifecycle Management Strategies

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

Risk Management Strategies

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

Levels of Service

- Continue to measure current levels of service in accordance with the metrics identified in O. Reg. 588/17 and those metrics that the Town 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.

4.2Bridges & Culverts

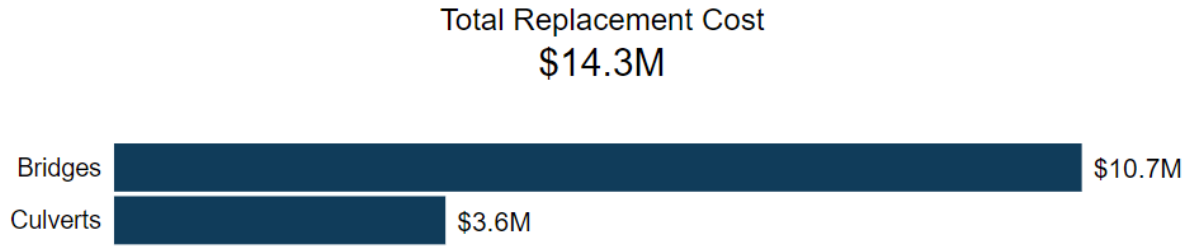
The Municipality's bridges and culverts comprises of 17 structures that have a span of 3 meters or more and are therefore categorized as a bridge or a structural culvert asset.

The Public Works Division is 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 Town's bridges and culverts inventory.

Asset Segment	Quantity	Replacement Cost Method	Total Replacement Cost
Bridges	9	User-Defined	$10,650,000
Structural Culverts	8	User-Defined	$3,647,159
			$14,297,159



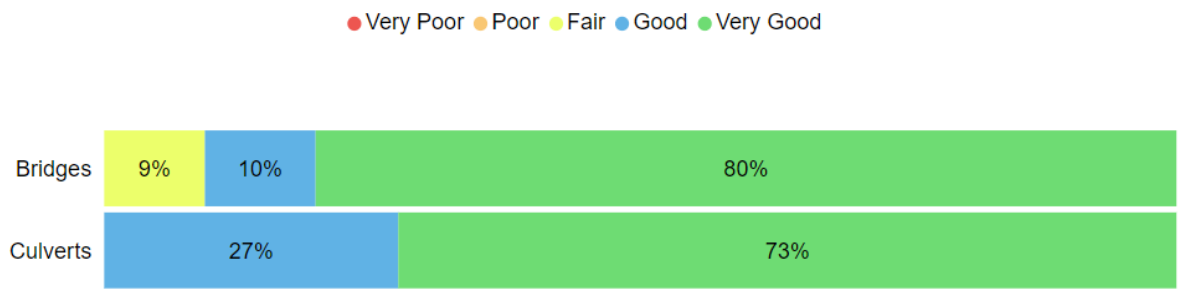
Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to more accurate represent realistic capital requirements.

4.2.2 Asset Condition

The 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
Bridges	83%	Very Good	100% Assessed
Structural Culverts	88%	Very Good	95% Assessed
	84%	**Very Good**	**99% Assessed**

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



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

Asset Segment	Estimated Useful Life (Years)	Average Age (Years)	Average Service Life Remaining (Years)
Bridges	75	47.9	62.4
Structural Culverts	35	13.7	30.3
		31.8	**47.3**

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.

4.2.4 Lifecycle Management Strategy

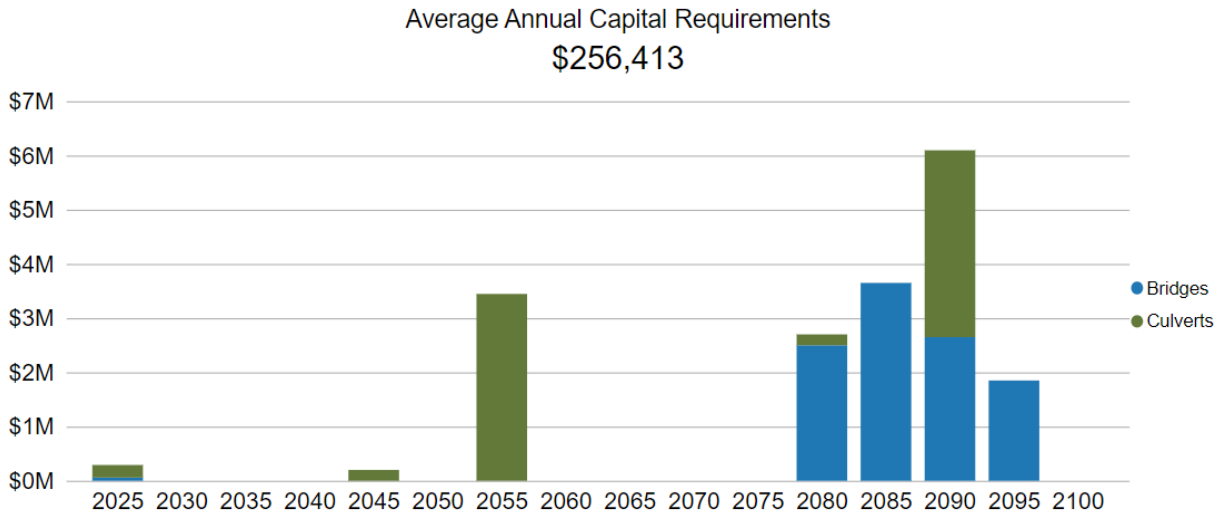
The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

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

Activity Type	Description of Current Strategy
Operations and Maintenance	Bridge deck cleaning is completed annually in the spring. Expansion joint cleaning is completed by external contractors on an as-needed basis
Rehabilitation and Replacement	All lifecycle activities are driven by the results of mandated structural inspections competed according to the Ontario Structure Inspection Manual (OSIM)
Inspection	The most recent inspection report was completed in 2021 by Tatham Engineering

Forecasted Capital Requirements

The following graph forecasts long-term capital requirements. The annual capital requirement represents the average amount per year that the Town should allocate towards funding rehabilitation and replacement needs. The following graph identifies capital requirements over the next 80 years. This projection is used as it ensures that every asset has gone through one full iteration of replacement. The forecasted requirements are aggregated into 5-year bins.



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

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 C for the criteria used to determine the risk rating of each asset.

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

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

Probability of Failure (POF)	Consequence of Failure (COF)
Condition (Economic)	Replacement Cost (Financial)
Loading Requirements (Operational)	

The identification of critical assets allows the Town to determine appropriate risk mitigation strategies and treatment options. Risk mitigation may include asset-

specific lifecycle strategies, condition assessment strategies, or simply the need to collect better asset data.

Risks to Current Asset Management Strategies

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

Capital Funding Strategies

Given the magnitude of construction costs, major capital rehabilitation projects for bridges and culverts may be deferred depending on the availability of grant funding opportunities. A long-term capital funding strategy can reduce dependency on grant funding and help prevent deferral of necessary capital works.

Aging Infrastructure

Several of the bridges located in the town are reaching the end of their useful life and will soon require full replacement. Staff have now implemented a proactive maintenance and capital rehabilitation strategy by following the recommendations provided in the Bridge Needs Study to extend the service life of structures at a lower cost.

4.2.6 Levels of Service

The following tables identify the Town's current level of service for bridges and 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 Town has selected for this AMP.

Community Levels of Service

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

Service Attribute	Qualitative Description	Current LOS (2021)
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. Only one of the Town's structures have loading or dimensional restrictions meaning that most types of vehicles, including heavy transport, motor vehicles, emergency vehicles and cyclists can cross them without restriction.
Safe & Regulatory	Description of the OSIM inspection process	External contractor completes OSIM inspections every 2 years providing detailed condition information for the Town's bridges and structural culverts. The contract between the Town and the external contractor includes OSIM inspections for 6 years.
Quality	Description or images of the condition of bridges and culverts and how this would affect use of the bridges and 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 and culverts.

Service Attribute	Technical Metric	Current LOS (2021)
Scope	% of bridges in the Town with loading or dimensional restrictions	11%
Quality	% of bridges inspected every two years	100%
	Average bridge condition index value for bridges in the Town	83
	% of bridges meeting the minimum maintenance standards defined by the community – BCI 40	100%
	Average bridge condition index value for structural culverts in the Town	88
	% of culverts meeting the minimum maintenance standards defined by the community – BCI 40	100%
Performance	Capital re-investment rate	2.69%

4.2.7 Recommendations

Data Review/Validation

- Continue to review and validate inventory data, assessed condition data and replacement costs for all bridges and structural culverts upon the completion of OSIM inspections every 2 years.

Lifecycle Management Strategies

- This AMP includes capital costs associated with the reconstruction and rehabilitation of bridges and culverts. The Town should continue to identify projected capital rehabilitation and renewal costs for bridges and culverts while integrating the findings of the OSIM inspections into long-term planning.

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 or data availability.

Levels of Service

- Continue to measure current levels of service in accordance with the metrics identified in O. Reg. 588/17 and those metrics that the Town 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.

4.3Storm Sewer Network

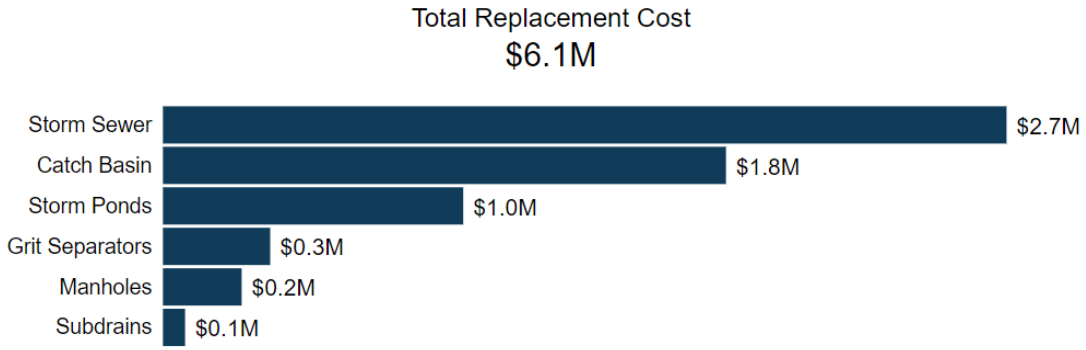
The Town is responsible for owning and maintaining a storm sewer network of 7,600 m of storm sewer mains, catch basins and other supporting infrastructure.

The Town recently completed a Master Storm Sewer Report with Tatham Engineering, to detail the existing function of the Town's storm sewer systems and provide recommendations for improvement. The implementation of this Master Storm Sewer Report also included developing a GIS database to document the location, characteristics, and hydraulic information of the Town's storm sewer infrastructure. This ensures that the asset inventory of the Storm Sewer Network is robust and complete. However, this data has not been merged with the centralized database. This is a priority for staff moving forward.

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 Town's storm sewer network inventory.

Asset Segment	Quantity	Replacement Cost Method	Total Replacement Cost
Catch Basin	620	User-Defined Cost	$1,785,000
Grit Separators	6	User-Defined Cost	$340,000
Manholes	15	User-Defined Cost	$249,500
Storm Ponds	6	User-Defined Cost	$952,000
Storm Sewer	7,612.73 m	User-Defined Cost	$2,674,415
Subdrains	9	User-Defined Cost	$70,200
			$6,071,115



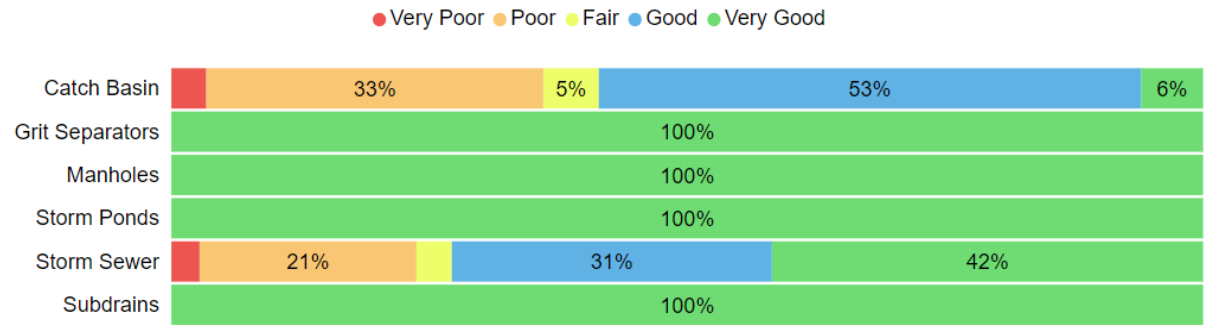
Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to more accurate represent realistic capital requirements.

4.3.2 Asset Condition

The 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.

	Average Condition (%)	Average Condition Rating	Condition Source
Catch Basin	55%	Fair	Age-Based
Grit Separators	86%	Very Good	Age-Based
Manholes	86%	Very Good	Age-Based
Storm Ponds	88%	Very Good	Age-Based
Storm Sewer	67%	Good	Age-Based
Subdrains	88%	Very Good	Age-Based
	69%	**Good**	**Age-Based**

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



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

- The Town recently completed their first Master Storm Sewer Report in 2021 with an external contractor. No condition score was used in the Master Storm Sewer Report, but deficiencies and areas for improvement were noted.
- The Town plans to continue to complete external assessments on the storm sewer network every 10 years going forward.

4.3.3 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)
Catch Basin	50	23.3	25.8
Grit Separators	100	14.3	85.7
Manholes	100	12.9	87.1
Storm Ponds	100	11.9	88.1
Storm Sewer	50-100	30.3	42.7
Subdrains	100	14.1	85.8
		25.1	**33.4**

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

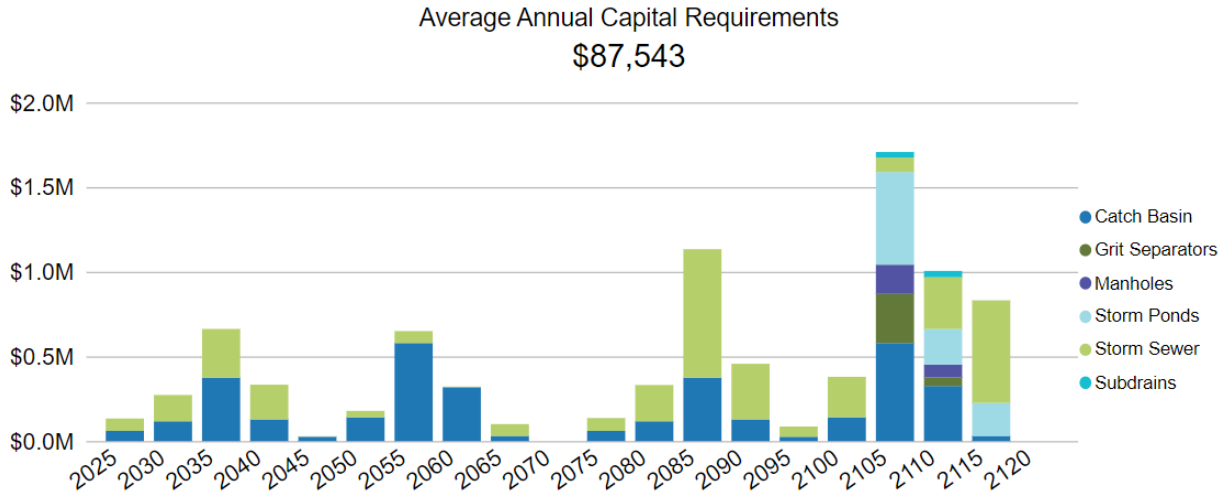
The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

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

Activity Type	Description of Current Strategy
Maintenance	A catch basin cleaning program is in place which includes the cleaning of all catch basins every spring
	Storm main flushing occurs reactively on an as-needed basis and storm water seperators are cleaned regularly by external contractors
	Storm water ponds undergo periodic inspections presently. It is anticipated that a storm water pond management plan will be required soon
	CCTV inspections were completed in 2016
Rehabiltion/ Replacement	Recently completed 2021 Master Storm Sewer Report provides recommendations for rehabilitation and reconstruction of the storm sewer assets

Forecasted Capital Requirements

The following graph forecasts long-term capital requirements. The annual capital requirement represents the average amount per year that the Town should allocate towards funding rehabilitation and replacement needs. The following graph identifies capital requirements over the next 100 years. This projection is used as it ensures that every asset has gone through one full iteration of replacement. The forecasted requirements are aggregated into 5-year bins.



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

4.3.5 Risk & Criticality

Risk Matrix

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

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

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

Linear Assets	
Probability of Failure (POF)	**Consequence of Failure (COF)**
Condition (Economic)	Replacement Cost (Financial)
Pipe Material (Operational)	Pipe Diameter (Operational)

Non-linear Assets	
Probability of Failure (POF)	**Consequence of Failure (COF)**
Condition (Economic)	Replacement Cost (Financial)

The identification of critical assets allows the Town to determine appropriate risk mitigation strategies and treatment options. Risk mitigation may include asset-specific lifecycle strategies, condition assessment strategies, or simply the need to collect better asset data.

Risks to Current Asset Management Strategies

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

Lifecycle Management Strategies

Historically lifecycle management strategy for the storm sewer network was considered more reactive than proactive. It is a challenge to find the right balance between maintenance, capital rehabilitation, and the replacement of assets. Staff are shifting towards a more proactive approach with the implementation of the Master Storm Sewer Report. These strategies will require sustainable annual funding to minimize the deferral of capital works

Infrastructure Design & Extreme Weather Events

Notable deficiencies in the Town's storm sewer infrastructure under existing and climate change conditions have been identified following the newly implemented Master Storm Sewer Report. The deficiencies identified include undersized sewers, lack of adequate drainage outlets and municipal infrastructure traversing through private property with no benefiting easements.

Aging Infrastructure

Historically improvements to the Town's storm sewer network has been limited , resulting in many storm sewer assets reaching the end of their useful life, or having already exceeded their useful life. The newly implemented Master Storm Sewer Report should assist in ensuring the storm sewer assets are replaced/rehabilitated prior to the end of their useful life.

Capital Funding Strategies

Major capital rehabilitation projects for the storm sewer network will be heavily reliant on the availability of grant funding opportunities. When grants are not available, storm sewer network rehabilitation projects may be deferred.

4.3.6 Levels of Service

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

Community Levels of Service

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

Service Attribute	Qualitative Description	Current LOS (2021)
Scope	Description, which may include map, of the user groups or areas of the municipality that are protected from flooding, including the extent of protection provided by the municipal storm sewer 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 (2021)
Scope	% of properties in municipality resilient to a 100-year storm	This data is not currently available. However, the municipality has accurate information on storm sewers deficiencies (Appendix E)
	% of the municipal storm sewer management system resilient to a 5-year storm	
Quality	% of the stormwater system that is in good or very good condition	73%
	% of the stormwater system that is in poor or very poor condition	24%
Performance	Capital reinvestment rate	0%

4.3.7 Recommendations

Asset Inventory

- The Town's storm sewer network inventory should leverage the availability of new data from the Master Storm Sewer Report or any other related document. The development of a comprehensive inventory of the storm sewer network should be priority.

Condition Assessment Strategies

- The development of a comprehensive inventory should be accompanied by a system-wide assessment of the condition of all assets in the storm sewer network through CCTV inspections. It also essential to ensure that this data gets captured in the centralized database.

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 or data availability.

Lifecycle Management Strategies

- Document and review lifecycle management strategies for the storm sewer network on a regular basis to achieve the lowest total cost of ownership while maintaining adequate service levels.

Levels of Service

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

4.4Facilities & Buildings

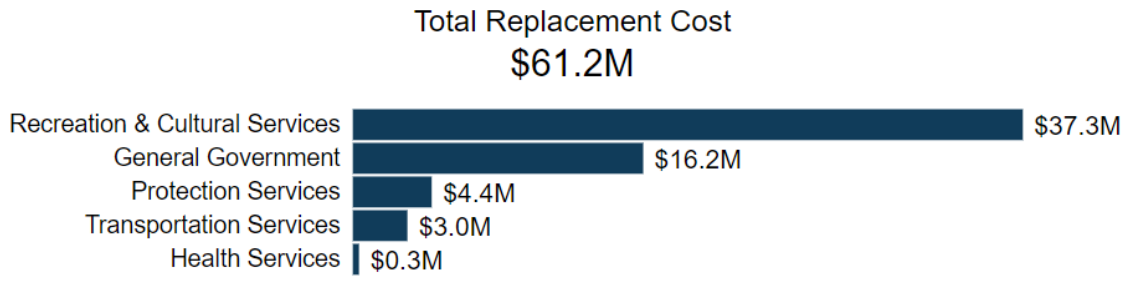
The Town of Gravenhurst owns and maintains several facilities and recreation centres that provide key services to the community. These include:

- municipal offices
- public libraries
- fire halls and associated offices and facilities
- public works garages and storage sheds
- aquatic centers, community centres and other recreational facilities

4.4.1 Asset Inventory & Replacement Cost

The table below includes the quantity, replacement cost method and total replacement cost of each asset segment in the Town's facilities and buildings inventory.

Asset Segment	Quantity	Replacement Cost Method	Total Replacement Cost
General Government	91	User-Defined	$16,150,175
Health Services	3	User-Defined	$41,999
Protection Services	67	User-Defined	$4,386,935
Recreation & Cultural Services	152	User-Defined	$37,265,395
Transportation Services	34	User-Defined	$3,035,279
			$61,179,783



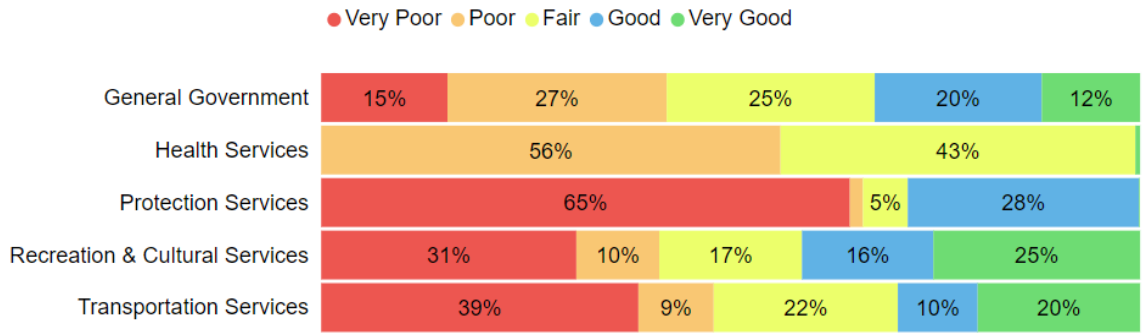
Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to more accurate represent realistic capital requirements.

4.4.2 Asset Condition

The 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
General Government	50%	Fair	20% Assessed
Health Services	32%	Poor	Age-Based
Protection Services	27%	Poor	26% Assessed
Recreation & Cultural Services	48%	Fair	23% Assessed
Transportation Services	42%	Fair	7% Assessed
	47%	**Fair**	**21% Assessed**

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



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

- A facilities assessment was completed in 2017 for all facilities above a $200,000 threshold. This was completed by Burnside engineering, and each facility received an FCI rating between 0 and 1.
- External contractors also perform inspections during their preventative maintenance activities, and internal staff complete visual inspections of the facilities.
- Staff would like to continue to complete an FCI every 5 years and would like to further componentize the buildings in the assessment and develop a more granular capital budget.

4.4.3 Estimated Useful Life & Average Age

The Estimated Useful Life for buildings and 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)
General Government	15-75	21.3	14.7
Health Services	15-75	27.9	20.8
Protection Services	15-75	27.2	14.4
Recreation & Cultural Services	15-75	15.5	20.2
Transportation Services	15-75	26.8	12.9
		20.4	**17.0**

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.

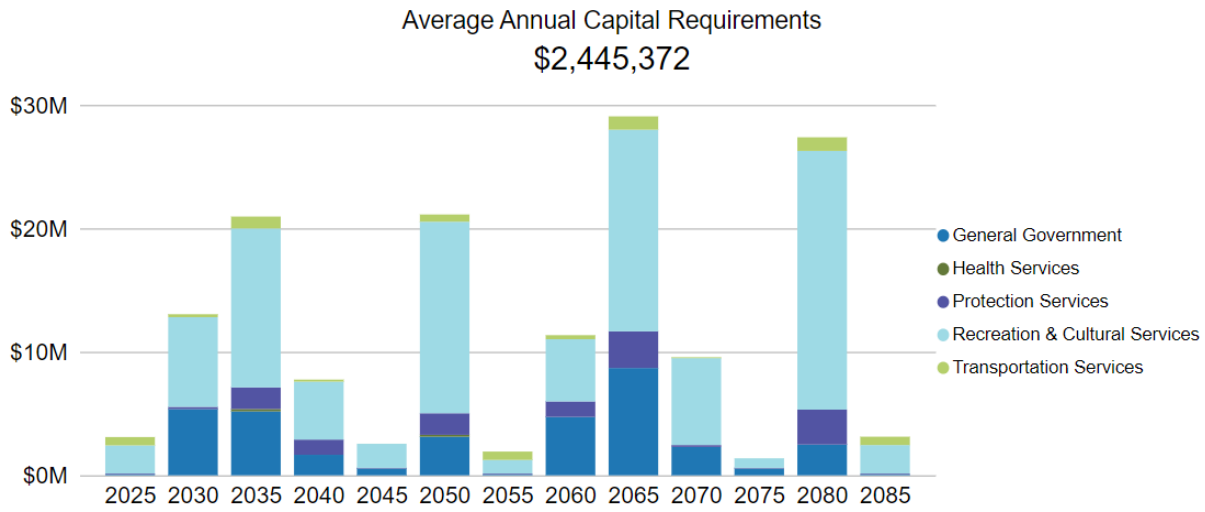
4.4.4 Lifecycle Management Strategy

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 Town's current lifecycle management strategy.

Activity Type	Description of Current Strategy
Maintenance / Rehabilitation	Municipal buildings are subject to regular inspections to identify structural deficiencies that require additional attention
	Critical buildings have a preventative maintenance and rehabilitation schedule, while the maintenance of other facilities are dealt with on a case-by-case basis
Replacement	As a supplement to the knowledge and expertise of municipal staff the Town regularly works with contractors to complete Facility Needs Assessment Studies

Forecasted Capital Requirements

The following graph forecasts long-term capital requirements. The annual capital requirement represents the average amount per year that the Town should allocate towards funding rehabilitation and replacement needs. The following graph identifies capital requirements over the next 65 years. This projection is used as it ensures that every asset has gone through one full iteration of replacement. The forecasted requirements are aggregated into 5-year bins.



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

4.4.5 Risk & Criticality

Risk Matrix

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

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

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

Probability of Failure (POF)	Consequence of Failure (COF)
Condition	Replacement Cost (Financial)

The identification of critical assets allows the Town to determine appropriate risk mitigation strategies and treatment options. Risk mitigation may include asset-specific lifecycle strategies, condition assessment strategies, or simply the need to collect better asset data.

Risks to Current Asset Management Strategies

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

Asset Data & Information

There is a lack of confidence in the available inventory data and condition data. The facilities assessment can be further componentized and FCI should be completed more frequently to have access to accurate risk/condition data to present to council when lobbying for betterments.

Staff Capacity & Community Expectations

Facilities staff are not able to complete all required activities and inspections due to limited staff capacity. The community expectations of the changing demographic moving into the municipality is impacting the level of service they require for buildings. New residents do not fully understand capabilities of department, and constraints due to staff capacity.

Infrastructure Design & Extreme Weather Events

Past designs of municipal facilities have been inadequate, which has impacted the staff's ability to effectively manage the facilities. Additionally, the quality of material used in construction of the facilities is declining. The useful life of newer materials used is much shorter, causing a need to replace building components more frequently. The design of the buildings also did not consider weather impacts, resulting in municipal facilities that are not built to withstand the weather experienced in the area, leading to wind damage and ice build up on roofs.

Infrastructure Re-Investment

The current level of investment in facilities and buildings is not sufficient to meet lifecycle requirements and maintain a good state of repair. Major projects are heavily dependent on grants. All betterments are also subject to council approval, which can cause delays in rehabilitation projects if funding request is denied.

4.4.6 Levels of Service

The following tables identify the Town's current level of service for the facilities and buildings. These metrics include the technical and community level of service metrics that the Town 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 facilities and buildings.

Service Attribute	Qualitative Description	Current LOS (2021)
Scope	Description of the lifecycle activities (maintenance, rehabilitation and replacement) performed on municipal facilities	A Facility condition index (FCI) scoring was completed in 2017, which resulted in a componentized action plan for maintenance/rehabilitation activities.
	Description of the current condition of municipal facilities and the plans that are in place to maintain or improve the provided level of service	Staff would like to perform more structural condition inspection on facilities, specifically recreation facilities (ex. roof inspections) and to expand scope of inspections to include non-recreational facilities. Staff would also like to develop a framework for facilities inspections to be used to determine what buildings should be inspected with insurance requirements incorporated into the framework.
Sustainable	Description of facilities that are energy efficient	Staff are proactively working towards making buildings more energy efficient by component - for example updating all lighting. If any building component requires replacement, energy efficiency is considered when purchasing a new one.
Accessibilty	Description of accessible facilities	An accessibility community has been formed in the town that provide recommendations for improvements to facilities to make them more accessible.

Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2021)
Scope	% of facilities that are in good or very good condition	37%
	% of facilities that are in poor or very poor condition	44%
	Average Risk Rating associated to buildings	12.66 - High
Performance	Capital reinvestment rate	1.53%

4.4.7 Recommendations

Asset Inventory

- The Town's asset inventory should get further componentized. Facilities consist of several separate capital components that have unique estimated 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.

Replacement Costs

- Gather accurate replacement costs and update on a regular basis to ensure the accuracy of capital projections.

Condition Assessment Strategies

- The Town should continue to implement and expand the scope of regular condition assessments for all facilities to better inform short- and long-term capital requirements.

Risk Management Strategies

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

Levels of Service

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

4.5Vehicles

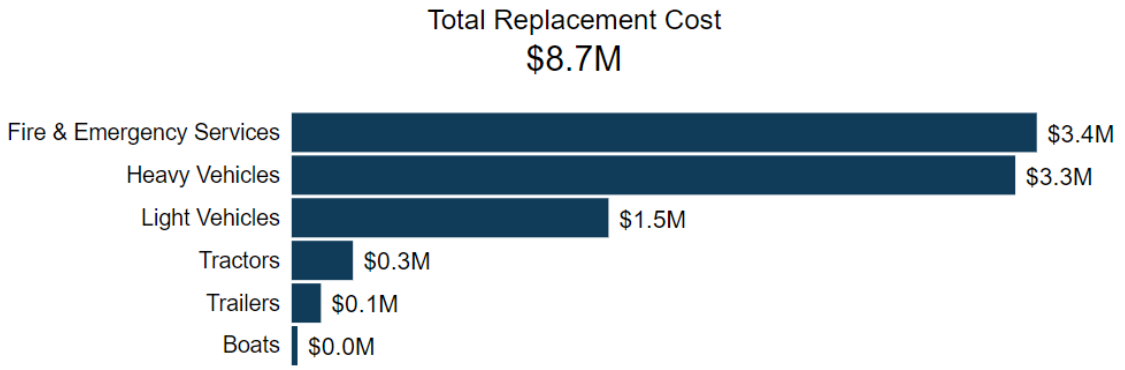
Vehicles allow staff to efficiently deliver municipal services and personnel. Municipal vehicles are used to support several service areas, including:

- boats and trailers
- fire rescue vehicles to provide emergency services
- pick-up trucks to support the maintenance of the transportation network

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 Town's vehicles.

Asset Segment	Quantity	Replacement Cost Method	Total Replacement Cost
Boats	1	User-Defined	$27,000
Fire & Emergency Services	9	User-Defined	$3,425,217
Heavy Vehicles	13	User-Defined	$3,326,502
Light Vehicles	35	User-Defined	$1,456,604
Tractors	4	User-Defined	$281,660
Trailers	9	User-Defined	$134,500
			$8,651,483



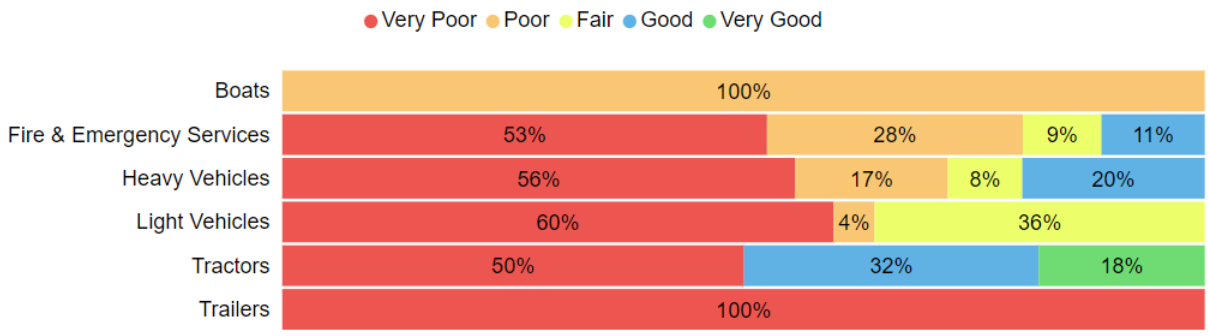
Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to more accurate represent realistic capital requirements.

4.5.2 Asset Condition

The 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
Boats	40%	Fair	Age-Based
Fire & Emergency Services	29%	Poor	Age-Based
Heavy Vehicles	27%	Poor	Age-Based
Light Vehicles	23%	Poor	Age-Based
Tractors	36%	Poor	Age-Based
Trailers	0%	Very Poor	Age-Based
	27%	**Poor**	**Age-Based**

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



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

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 Town's current approach:

- Staff complete regular visual inspections of vehicles using a template for post and pre trip inspections to ensure they are in state of adequate repair
- Triggers are included on inspection forms to perform maintenance tasks, and non-critical items are incorporated into the budget for the following year

4.5.3 Estimated Useful Life & Average Age

The Estimated Useful Life for vehicles 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)
Boats	25	15.1	9.9
Fire & Emergency Services	15	10.1	4.9
Heavy Vehicles	10-15	9.7	0.8
Light Vehicles	5	7.2	-2.2
Tractors	10	9.1	0.9
Trailers	5	13.7	-8.7
		9.1	**-1.2**

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.

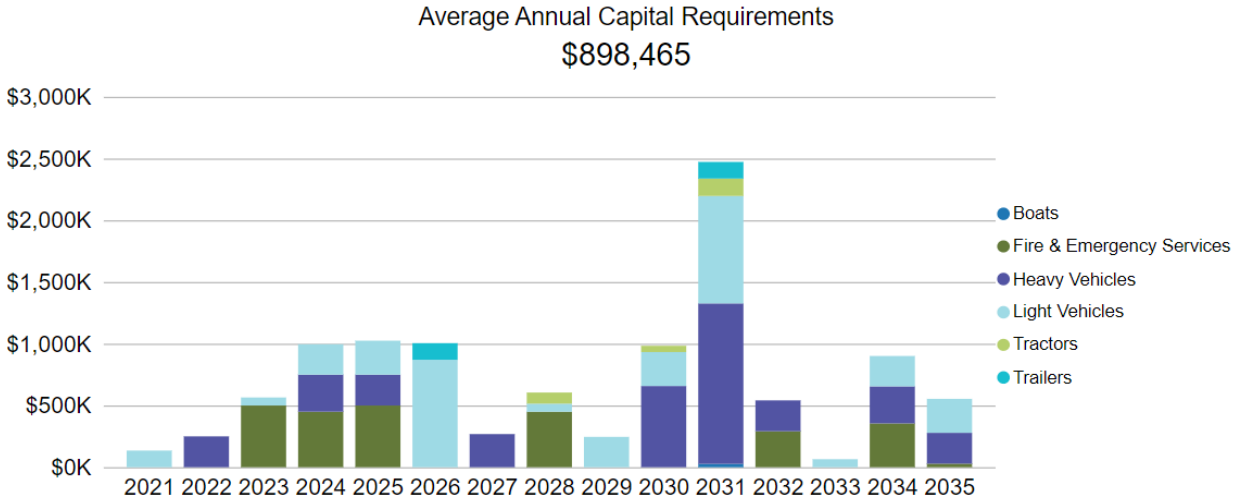
4.5.4 Lifecycle Management Strategy

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 Town's current lifecycle management strategy.

Activity Type	Description of Current Strategy
Maintenance / Rehabilitation	Visual inspections completed and documented daily
	Annual preventative maintenance activities completed where possible
Replacement	Vehicle replacements are based on insurance policies and standards, especially for fire vehicles
	Vehicle age is driving factor when determining appropriate treatment options

Forecasted Capital Requirements

The following graph forecasts long-term capital requirements. The annual capital requirement represents the average amount per year that the Town should allocate towards funding rehabilitation and replacement needs. The following graph identifies capital requirements over the next 15 years. This projection is used as it ensures that every asset has gone through one full iteration of replacement. The forecasted requirements are aggregated into 1-year bins.



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

4.5.5 Risk & Criticality

Risk Matrix

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

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

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

Probability of Failure (POF)	Consequence of Failure (COF)
Condition	Replacement Cost (Financial)
	Department (Health and Safety)

The identification of critical assets allows the Town to determine appropriate risk mitigation strategies and treatment options. Risk mitigation may include asset-specific lifecycle strategies, condition assessment strategies, or simply the need to collect better asset data.

Risks to Current Asset Management Strategies

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

Infrastructure Design & Climate Change
In the past staff have purchased vehicles that were custom made which did not meet the service requirements. The design of these vehicles had to be changed when repurchasing the vehicles. Additionally, an increase in excessive freeze and thaw cycles of the roads due to climate change is impacting the vehicles required to perform salting, etc. Developing functional specifications prior to vehicle purchase will help mitigate this risk, and ensure vehicles purchased are appropriate for their required uses.

Growth & Community Expectations
As the population of the municipality continues to increase, they will be taking on more land that will require more fire and public works vehicles to service the additional land. The changing demographic in the area due to community growth will also lead to higher community expectations for levels of services provided by the municipal vehicles.

Regulatory Requirements & Funding
Upper tier municipalities and the province are downloading more responsibility to the lower tier municipalities. This will require more vehicles and equipment to perform these additional services, with no more access to funding to purchase the required vehicles.

4.5.6 Levels of Service

The following tables identify the Town's current level of service for the vehicles. These metrics include the technical and community level of service metrics that the Town 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 vehicles.

Service Attribute	Qualitative Description	Current LOS (2021)
Scope	Description of the Fleet Management and Safety Program	Commercial vehicles meet minimum standards and undergo an inspection twice a year. Staff aim to inspect non-commercial vehicles annually. Training is providing during hiring process for the operation of the vehicles.
	Description of the lifecycle activities (maintenance, rehabilitation and replacement) performed on vehicles	A replacement program is in place for vehicles with arrangement for the relinquishment of the vehicles to a private company. Vehicle age and condition is considered when replacing vehicles. Legislation requirements are followed for fire vehicle replacement.
Sustainable	Description of vehicles that are fuel efficient	Staff are proactively working towards making vehicles more energy efficient by component. The purchase of electric vehicles is considered when buying new vehicles, along with the environment and emissions.

Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2021)
Scope	% of vehicles where asset age exceeds useful life	42%
	% of vehicles in good or very good condition	14%
	% of vehicles in poor of very poor condition	74%
	Average Risk Rating associated to vehicles	13.45 - High
Performance	Capital reinvestment rate	13.29%

4.5.7 Recommendations

Replacement Costs

- Continue to gather accurate replacement costs and update on a regular basis to ensure the accuracy of capital projections.

Condition Assessment Strategies

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

Risk Management Strategies

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

Levels of Service

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

4.6Machinery & Equipment

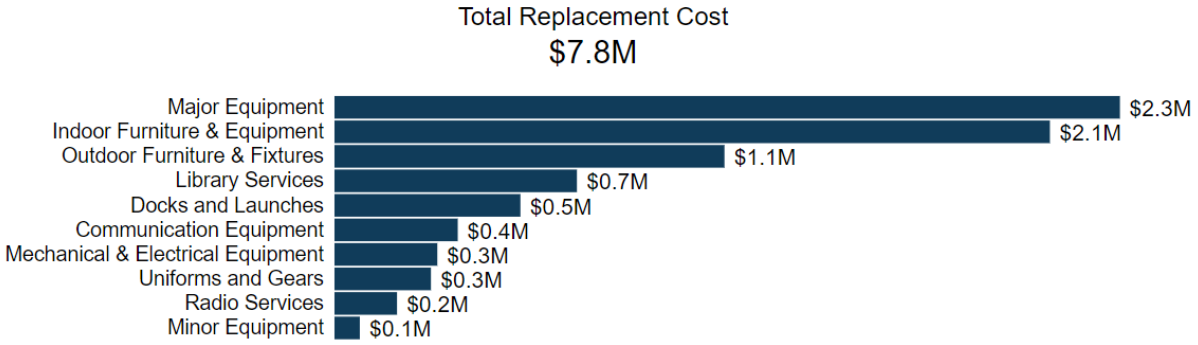
In order to maintain the high quality of public infrastructure and support the delivery of core services, Town staff own and employ various types of machinery and equipment. This includes:

- Docks and launches
- Fire equipment to support the delivery of emergency services
- Public works equipment
- Library books for public loan

4.6.1 Asset Inventory & Replacement Cost

The following table includes the quantity, replacement cost method and total replacement cost of each asset segment in the Town's machinery and equipment inventory.

Asset Segment	Quantity	Replacement Cost Method	Total Replacement Cost
Communication Equipment	24	User-Defined	$353,450
Docks and Launches	25	User-Defined	$533,132
Indoor Furniture & Equipment	173	User-Defined	$2,051,418
Library Services	20	User-Defined	$695,152
Major Equipment	24	User-Defined	$2,252,181
Mechanical & Electrical Equipment	19	User-Defined	$294,887
Minor Equipment	9	User-Defined	$72,624
Outdoor Furniture & Fixtures	22	User-Defined	$1,118,220
Radio Services	11	User-Defined	$179,318
Uniforms and Gears	8	User-Defined	$276,557
			$7,826,940



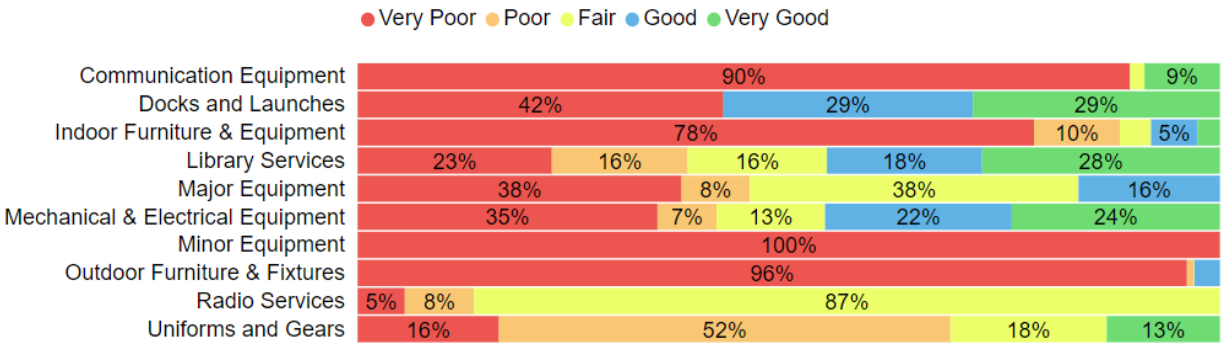
Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to more accurate represent realistic capital requirements.

4.6.2 Asset Condition

The 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
Communication Equipment	12%	Very Poor	Age-Based
Docks and Launches	46%	Fair	Age-Based
Indoor Furniture & Equipment	13%	Very Poor	Age-Based
Library Services	53%	Fair	Age-Based
Major Equipment	42%	Fair	Age-Based
Mechanical & Electrical Equipment	45%	Fair	Age-Based
Minor Equipment	0%	Very Poor	Age-Based
Outdoor Furniture & Fixtures	3%	Very Poor	Age-Based
Radio Services	45%	Fair	Age-Based
Uniforms and Gears	40%	Fair	Age-Based
	28%	**Poor**	**Age-Based**

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



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

- Staff complete regular inspections of their machinery and equipment abased on standards defined by regulatory and insurance requirements.

4.6.3 Estimated Useful Life & Average Age

The Estimated Useful Life for machinery and 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)
Communication Equipment	10	14.7	-4.7
Docks and Launches	10	15.7	-5.7
Indoor Furniture & Equipment	10	13.9	-3.9
Library Services	10	7.3	2.7
Major Equipment	10-15	11.2	1.1
Mechanical & Electrical Equipment	10	12.7	-2.8
Minor Equipment	10	21.7	-11.7
Outdoor Furniture & Fixtures	10	13.1	-3.1
Radio Services	10	8.1	1.9
Uniforms and Gears	10	5.5	4.5
		15.1	**-3.0**

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.

4.6.4 Lifecycle Management Strategy

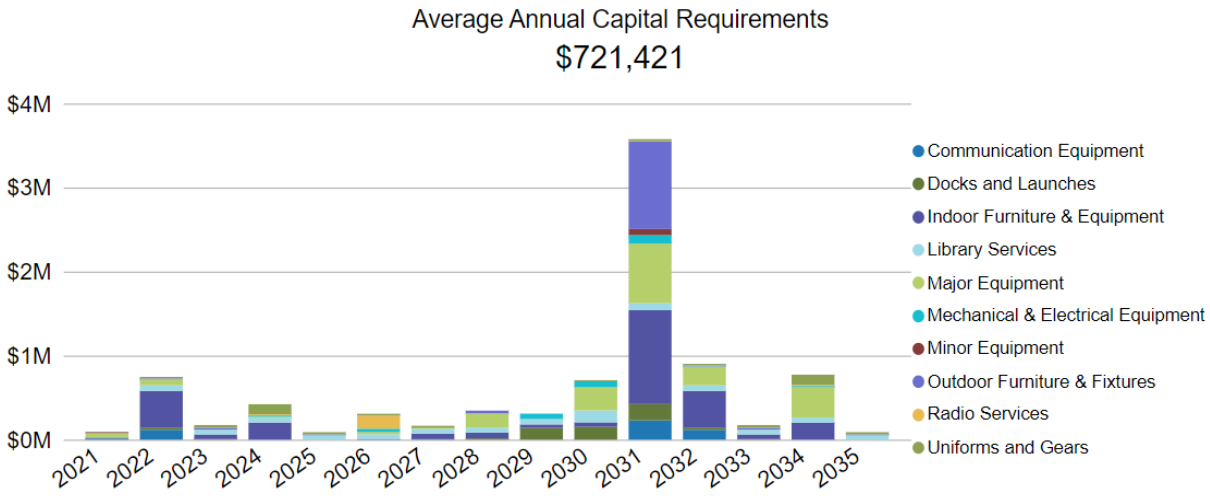
The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

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

Activity Type	Description of Current Strategy
Maintenance/ Rehabilitation	Maintenance program varies by department
	Fire Protection Services equipment is subject to a much more rigorous inspection and maintenance program compared to most other departments
	Machinery and equipment is maintained according to insurance recommended actions and supplemented by the expertise of municipal staff
Replacement	The replacement of machinery and equipment depends on deficiencies identified by operators that may impact their ability to complete required tasks, maintenance costs associated to the machinery & equipment, life cycle replacement identified in the previous AMP, and risk assessments.

Forecasted Capital Requirements

The following graph forecasts long-term capital requirements. The annual capital requirement represents the average amount per year that the Town should allocate towards funding rehabilitation and replacement needs. The following graph identifies capital requirements over the next 15 years. This projection is used as it ensures that every asset has gone through one full iteration of replacement. The forecasted requirements are aggregated into 1-year bins.



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

4.6.5 Risk & Criticality

Risk Matrix

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

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

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

Probability of Failure (POF)	Consequence of Failure (COF)
Condition	Replacement Cost (Financial)

The identification of critical assets allows the Town to determine appropriate risk mitigation strategies and treatment options. Risk mitigation may include asset-specific lifecycle strategies, condition assessment strategies, or simply the need to collect better asset data.

Risks to Current Asset Management Strategies

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

Community Expectations
The changing demographic in the area due to community growth will also lead to higher community expectations for levels of services provided by the municipality.

Regulatory Requirements & Funding
Upper tier municipalities and the province are downloading more responsibility to the lower tier municipalities. This will require more equipment to perform these additional services, with no more access to funding to purchase the required equipment.

4.6.6 Levels of Service

The following tables identify the Town's current level of service for the machinery and equipment. These metrics include the technical and community level of service metrics that the Town 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 machinery and equipment.

Service Attribute	Qualitative Description	Current LOS (2021)
Scope	Description of the lifecycle activities (maintenance, rehabilitation and replacement) performed on machinery and equipment assets	Some assets are run to failure, such as radios, speakers, etc., as their service lives vary. Dock renewal activities are based on public complaints; staff then performs inspections, and an external contractor also performs an inspection to determine work plans. Furniture and fixtures are replaced on an as-needed basis, often the result of staff complaints relating to the ergonomics of the office furniture.
Sustainable	Description of the current condition of machinery & equipment and the plans that are in place to maintain or improve the provided level of service	The average condition of the machinery and equipment is poor, as it relies on age-based condition. A master Parks Maintenance & Operations Plan has recently been developed, which includes the docks and launches, to address lifecycle activities more proactively.

Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2021)
Scope	% of machinery and equipment in good or very good condition	18%
	% of machinery and equipment in poor of very poor condition	66%
	Average Risk Rating associated to machinery and equipment	8.8 - Moderate
Performance	Capital reinvestment rate	1.53%

4.6.7 Recommendations

Replacement Costs

- Continue to gather accurate replacement costs and update on a regular basis to ensure the accuracy of capital projections.

Condition Assessment Strategies

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

Risk Management Strategies

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

Levels of Service

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

4.7Land Improvements

The Town of Gravenhurst owns a small number of assets that are considered land improvements. This category includes:

- Wharfs and docks
- Playground equipment
- Fencing and signage
- Parking lots
- Miscellaneous landscaping and other assets

A Maintenance and Operations Plan was recently developed for the Parks Division, which includes an asset inventory all Parks Division assets, an associated classification for each asset, and the Parks Division Maintenance Standards and Standard Operating Procedures.

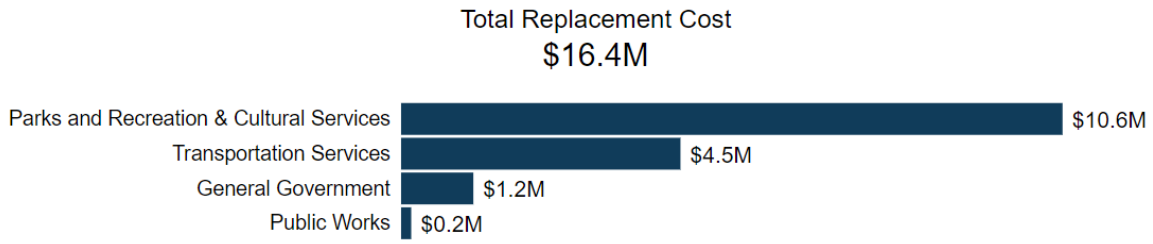
A comprehensive list of all the assets maintained by the Parks Division is included in this Plan, which assisted in ensuring that all land improvement assets were accounted for in the Asset Management Plan. Additionally, a breakdown of each the care and maintenance activities required for the Town's ten major operation sections are detailed in the Maintenance and Operations Plan.

Standard Operating Procedures have also been developed for the Parks Division, which can assist in ensuring proper asset management and lifecycle activities are performed for all asset owned or supported by the Parks Division.

4.7.1 Asset Inventory & Replacement Cost

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

Asset Segment	Quantity	Replacement Cost Method	Total Replacement Cost
General Government	7	User-Defined	$1,160,648
Parks and Recreation & Cultural Services	130	User-Defined	$10,624,104
Public Works	8	User-Defined	$162,545
Transportation Services	47	User-Defined	$4,487,169
			$16,434,466



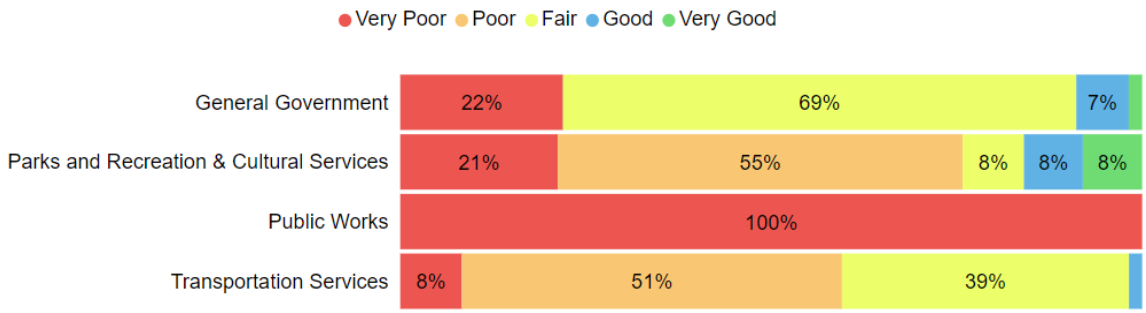
Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to more accurate represent realistic capital requirements.

4.7.2 Asset Condition

The 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
General Government	42%	Fair	Age-Based
Parks and Recreation & Cultural Services	31%	Poor	Age-Based
Public Works	3%	Very Poor	Age-Based
Transportation Services	32%	Poor	Age-Based
	32%	**Poor**	**Age-Based**

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



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

- The Parks Maintenance and Operations Plan includes a daily assessment/checklist that Parks staff must perform for various land improvement assets. Any issues noted during the inspection are reported.
- No formal condition score is applied to the land improvement assets, but staff are working towards including a condition score in the Parks Maintenance and Operations Plan.

4.7.3 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)
General Government	20	11.7	8.3
Parks and Recreation & Cultural Services	6-20	14.7	1.7
Public Works	10-20	18.8	-7.5
Transportation Services	20	18.9	1.1
		15.8	**1.4**

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

4.7.4 Lifecycle Management Strategy

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

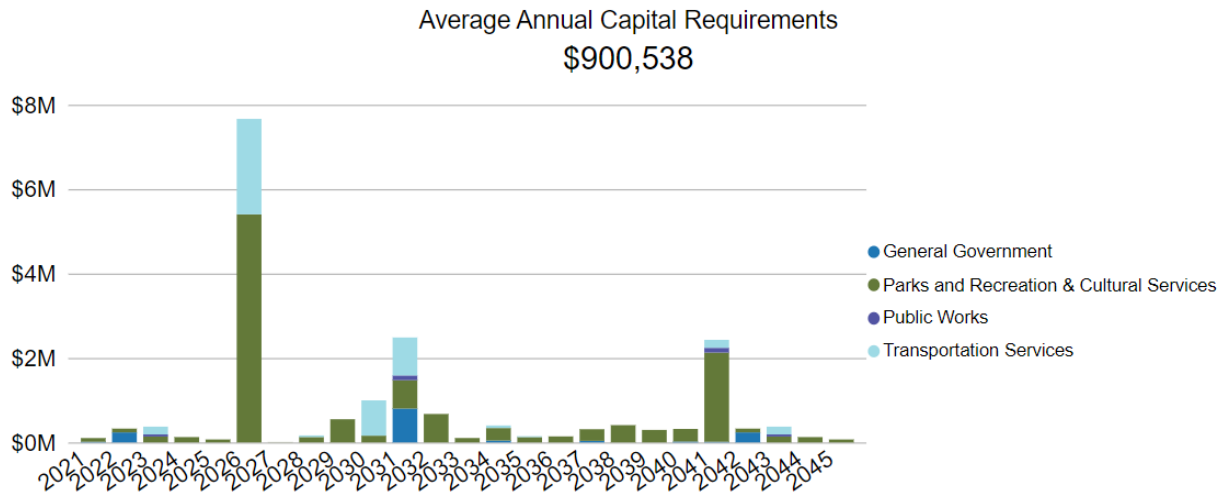
All maintenance, rehabilitation and replacement activities for the land improvement assets are governed by the Parks Maintenance and Operations Plan and the Standard Operating Procedures.The following list outlines the maintenance, rehabilitation and replacement activities included in the Parks – Standard Operating Procedures document:

- SOP PKS-1.01 Irrigation System Maintenance and Repair
- SOP PKS-1.02 Special Events / In-kind Services
- SOP PKS-1.03 Park Washroom Cleaning and Maintenance
- SOP PKS-1.04 Park Signage - Installation, Maintenance and Repair
- SOP PKS-1.05 Equipment / Vehicles – Minor Maintenance and Repair
- SOP PKS-1.06 Lighting at Wharf Boardwalk and Outdoor Recreational / Park Amenities – Maintenance and Repair
- SOP PKS-1.07 Garbage Container / Picnic Table and Park Furnishing - Distribution and Maintenance
- SOP PKS-1.08: Parks Garbage Collection / Removal & Litter Pick-up
- SOP PKS-1.09 Vandalism and Graffiti – Removal and Repair
- SOP PKS-2.01 Grass Cutting – Parks, Facility Grounds and Other
- SOP PKS-2.02 Event Field Maintenance – Aerating, Top Dressing, Over-seeding, Fertilizing
- SOP PKS-2.03 Hanging Baskets, Window Boxes and Planter Maintenance (Annuals)
- SOP PKS-2.04 Garden Bed Maintenance
- SOP PKS-3.01 Invasive Species Program
- SOP PKS-3.02 Children’s Memorial Gazebo
- SOP PKS-3.03 Spring and Fall Shrub Sales
- SOP PKS-3.04 Tree and Bench Dedication Program
- SOP PKS-4.01 Sidewalk | Wharf Boardwalk – Winter Maintenance (Plow, Salt, Sand) SOP PKS-5.01 Parks – General Inspection and Minor Maintenance
- SOP PKS-5.02 Wharf Boardwalk, Pathways & Pavers – Inspection and Maintenance SOP PKS-5.03 Playground Equipment – General Inspection and Minor Maintenance
- SOP PKS-5.04 Playground Equipment – Major Maintenance and Repair
- SOP PKS-5.05 Beaches and Waterfront - Inspection and Maintenance
- SOP PKS-5.06 Docks & Boat Launches - Inspection and Maintenance

- SOP PKS-5.07 Outdoor Skateboard Park – Inspection and Maintenance
- SOP PKS-5.08 Outdoor Volleyball Court - Inspection and Maintenance
- SOP PKS-5.09 Outdoor Tennis & Pickle Ball Courts - Inspection and Maintenance
- SOP PKS-5.10 Outdoor Basketball Courts - Inspection and Maintenance
- SOP PKS-5.11 Outdoor Natural Ice Rink - Inspection and Maintenance
- SOP PKS-5.12 Outdoor Splash Pad - Inspection and Maintenance
- SOP PKS-5.13 Baseball Diamonds - General Inspection and Maintenance
- SOP PKS-5.14 Baseball Diamond Infield Grooming
- SOP PKS-5.15: Recreational Trail System – Inspection, Maintenance and Repair

Forecasted Capital Requirements

The following graph forecasts long-term capital requirements. The annual capital requirement represents the average amount per year that the Town should allocate towards funding rehabilitation and replacement needs. The following graph identifies capital requirements over the next 25 years. This projection is used as it ensures that every asset has gone through one full iteration of replacement. The forecasted requirements are aggregated into 1-year bins.

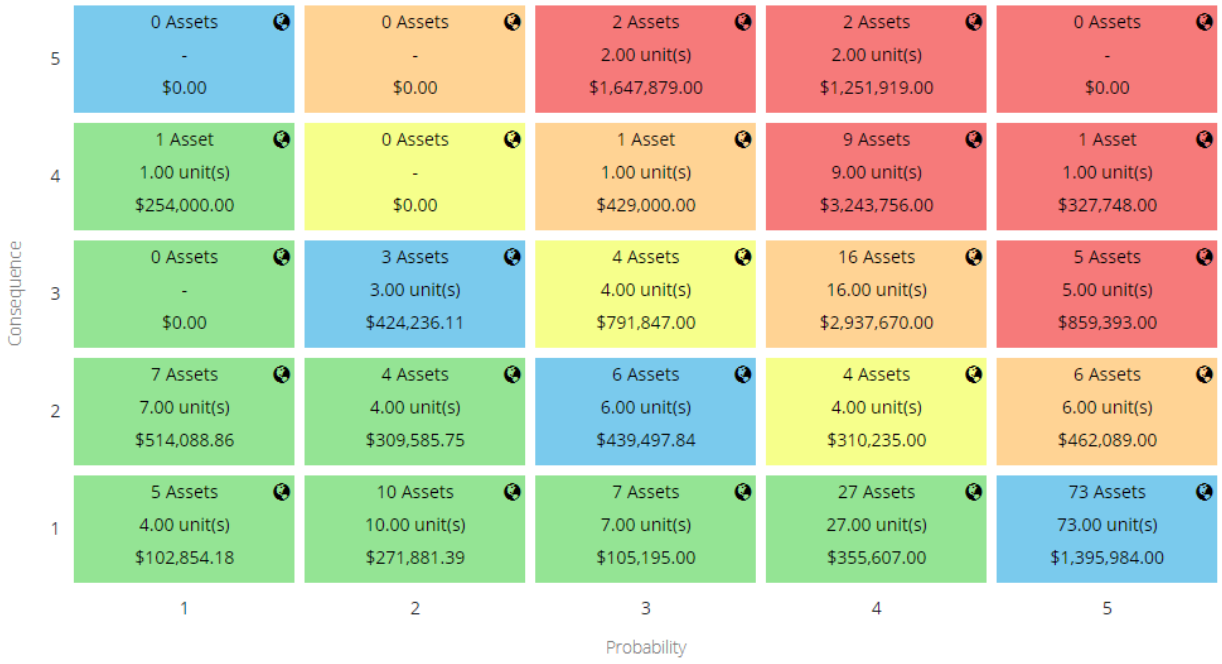


The projected cost of lifecycle activities that will need to be undertaken over the next 10 years to maintain the current level of service can be found in Appendix A.

4.7.5 Risk & Criticality

Risk Matrix

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



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

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

Probability of Failure (POF)	Consequence of Failure (COF)
Condition	Replacement Cost (Financial)
	Number of Visitors (Social)

The probability of failure of the assets is not solely condition based, staff also consider legislative/regulatory requirements provided by the Accessibility for Ontarians with Disabilities Act (AODA), which is heavily reliant on asset age.

Additionally, while the number of visitors is not currently monitored, staff would like to work towards tracking this to incorporate into their risk models.
The identification of critical assets allows the Town to determine appropriate risk mitigation strategies and treatment options. Risk mitigation may include asset-specific lifecycle strategies, condition assessment strategies, or simply the need to collect better asset data.

Risks to Current Asset Management Strategies

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

Staff Capacity

Due to staffing limitations, a portion of the parks operations have been outsourced to external contractors in the municipality as a mitigation strategy to sustain service levels.

Asset Age and Regulatory Requirements

The requirements set in place by the Accessibility for Ontarians with Disabilities Act (AODA) dictates that there is a deadline for all infrastructure to be replaced dependent on it's age. Due to these requirements, some land improvement assets are being prematurely replaced based solely on their age, not the assessed condition. Additionally, some of the land improvement assets in the municipality do not meet regulatory requirements due to their age.

Infrastructure Design and Extreme Weather Events

Municipal staff have experienced some challenges with the previous design of some land improvements, particular docks and break walls. Due to cost constraints, staff have had to switch to using pressure treated wood for their docks instead of the previously used cedar, altering the useful life of the assets. Additionally, break walls were not designed to withstand the high wave strength that they are experiencing, which is causing damage to various land improvements from the water rushing over the break walls.

4.7.6 Levels of Service

The following tables identify the Town's current level of service for the land improvements. These metrics include the technical and community level of service metrics that the Town 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 land improvements.

Service Attribute	Qualitative Description	Current LOS (2021)
Scope	Description of the lifecycle activities (maintenance, rehabilitation and replacement) performed on land improvement assets	A Parks Operation Plan identifies all assets overseen by the Parks Division,. Standard operating procedures are developed to maintain these assets. The location of these assets is known and identified in the park's operations documents. A full inventory, including components of assets, is included in the park operations plan. There is also an inventory of cemetery assets. Legislation requirements (CSA) also help determine if asset should be replaced if they do not meet the requirements. Additionally, AODA needs are identified.
Sustainable	Description of the current condition of machinery & equipment and the plans that are in place to maintain or improve the provided level of service	Staff are working towards including a condition score for all land improvement assets (such as park benches, lighting) to have an accurate idea of the condition of each asset.

Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2021)
Scope	% of land improvement assets in good or very good condition	11%
	% of land improvement assets with accessible parking	90%
	Average Risk Rating associated to land improvements	11.78 - High
Performance	Capital reinvestment rate	6.33%

4.7.7 Recommendations

Replacement Costs

- Continue to gather accurate replacement costs and update on a regular basis to ensure the accuracy of capital projections.

Condition Assessment Strategies

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

Risk Management Strategies

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

Levels of Service

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

4.8Information Technology

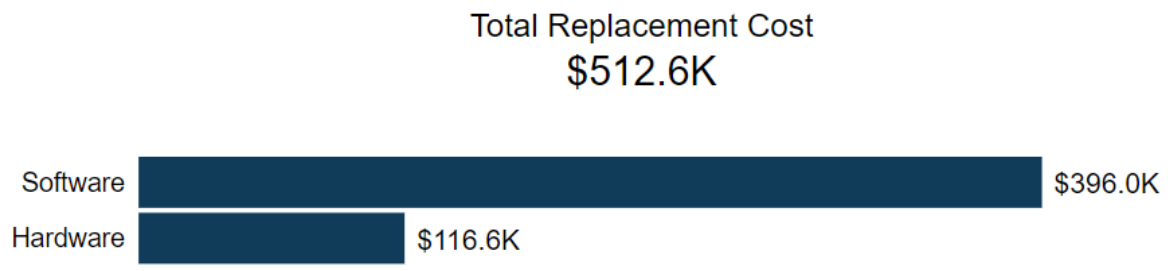
In order to maintain the high quality of public infrastructure and support the delivery of core services, Town staff own and employ various types of information technology. This includes:

- Hardware
- Software

4.8.1 Asset Inventory & Replacement Cost

The following table includes the quantity, replacement cost method and total replacement cost of each asset segment in the Town's machinery and equipment inventory.

Asset Segment	Quantity	Replacement Cost Method	Total Replacement Cost
Hardware	61	User-Defined	$116,600
Software	8	User-Defined	$395,950
			$512,550



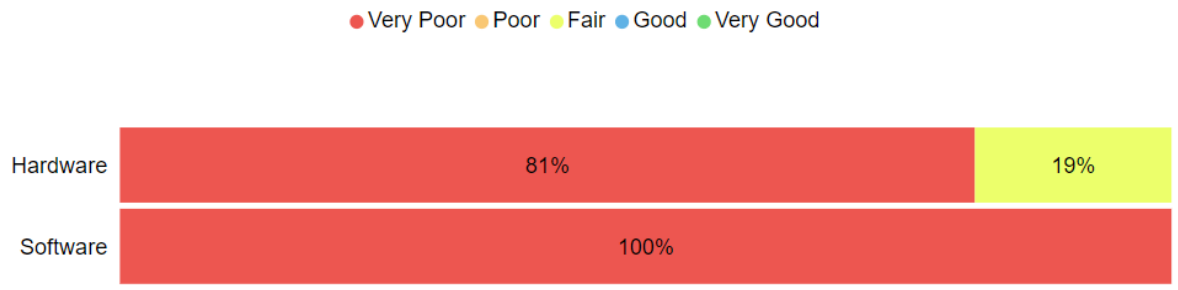
Each asset's replacement cost should be reviewed periodically to determine whether adjustments are needed to more accurate represent realistic capital requirements.

4.8.2 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
Hardware	12%	Very Poor	Age-Based
Software	0%	Very Poor	Age-Based
	3%	**Very Poor**	**Age-Based**

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



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

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 Town's current approach:

- There is no formal condition assessment in place for information technology assets.

4.8.3 Estimated Useful Life & Average Age

The Estimated Useful Life for information technology 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)
Hardware	3	3.1	-0.1
Software	3	6.6	-3.6
		3.5	**-0.5**

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.

4.8.4 Lifecycle Management Strategy

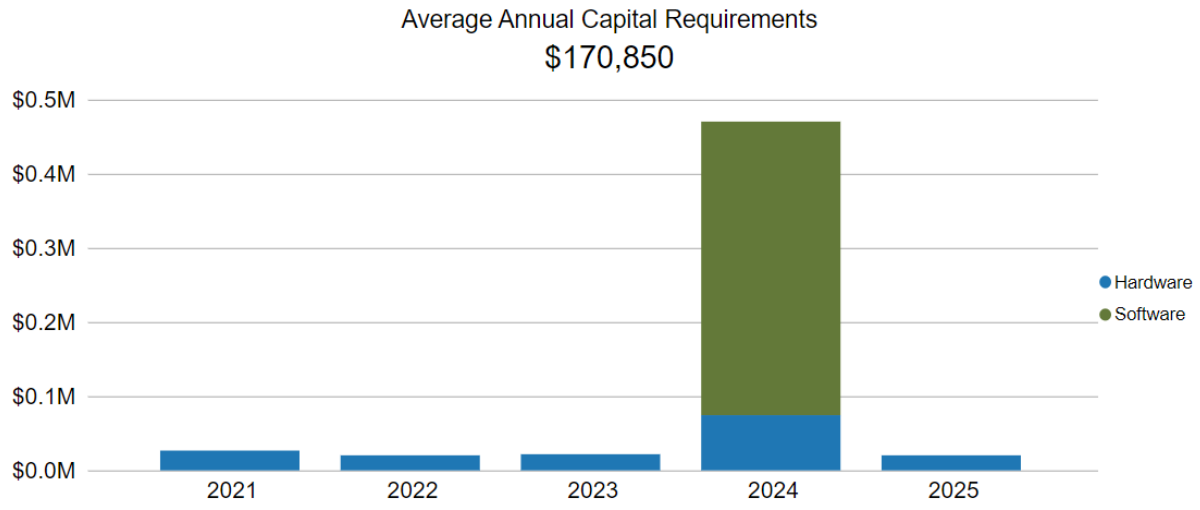
The condition or performance of most assets will deteriorate over time. To ensure that municipal assets are performing as expected and meeting the needs of customers, it is important to establish a lifecycle management strategy to proactively manage asset deterioration.

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

Activity Type	Description of Current Strategy
Maintenance, Rehabilitation & Replacement	Upper tier municpality provides hardware, software and IT support. The contractual agreement determines the timeline for the replacement of IT equipment.

Forecasted Capital Requirements

The following graph forecasts long-term capital requirements. The annual capital requirement represents the average amount per year that the Town should allocate towards funding rehabilitation and replacement needs. The following graph identifies capital requirements over the next 5 years. This projection is used as it ensures that every asset has gone through one full iteration of replacement. The forecasted requirements are aggregated into 1-year bins.



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.

4.8.5 Risk & Criticality

Risk Matrix

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

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

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

Probability of Failure (POF)	Consequence of Failure (COF)
Condition	Replacement Cost (Financial)

The identification of critical assets allows the Town to determine appropriate risk mitigation strategies and treatment options. Risk mitigation may include asset-specific lifecycle strategies, condition assessment strategies, or simply the need to collect better asset data.

Risks to Current Asset Management Strategies

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

Software Compatibility

Some departments in the municipality based on business unit needs have purchased their own software platforms with no consultation between departments when purchasing new software. This has resulted in departments purchasing software that is not compatible with software in other departments. For example, an inventory software purchased may not be compatible with the municipality's financial software.

COVID 19 and Remote Working

Many staff have had to transition working remotely due to the COVID 19 pandemic and continue to do so. With the increase in people working from home, more IT equipment is required. For example, the purchase of laptops and configuration of a VPN.

4.8.6 Levels of Service

The following tables identify the Town's current level of service for the information technology assets. These metrics include the technical and community level of service metrics that the Town 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 information technology assets.

Service Attribute	Qualitative Description	Current LOS (2021)
Scope	Description of the lifecycle activities (maintenance, rehabilitation and replacement) performed on IT assets	All hardware, software and IT support is purchased from the upper tier municipality who provides all the required hardware software and IT support. The contractual agreement determines the timeline for when replacement of IT equipment is required.
Sustainable	Description of the current condition of IT assets and the plans that are in place to maintain or improve the provided level of service	The Town requests a software that is required, and the district provides recommendations. The Town can investigate different options for software other than the recommendations, but it must be compatible with the district's server.

Technical Levels of Service

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

Service Attribute	Technical Metric	Current LOS (2021)
Scope	% of IT assets that are in good or very good condition	0%
	% of IT assets that are in poor of very poor condition	96%
	Average Risk Rating associated to IT assets	11.55 - High
Performance	Capital reinvestment rate	62%

4.8.7 Recommendations

Replacement Costs

- Continue to gather accurate replacement costs and update on a regular basis to ensure the accuracy of capital projections.

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

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

5 Impacts of Growth

Key Insights

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

- Moderate population and employment growth is expected

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

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 Town to plan for new infrastructure more effectively, and the upgrade or disposal of existing infrastructure. Increases or decreases in demand can affect what assets are needed and what level of service meets the needs of the community.

5.1.1 Gravenhurst Official Plan (2016)

The Town of Gravenhurst adopted an Official Plan to develop a foundation for decisions making, and to establish the pattern which development within the town should follow from the years 2016 to 2036. The policies included in the Official Plan describe development policies and the plans of the Town, and to outline a future development plan for the Town.

The Official Plan has been approved by the Town as of December 20th,2016.

The Town of Gravenhurst is structured such that it contains an Urban Centre, Five Rural Settlement Areas, a Waterfront Area, and a Rural Area. The goal of the Official Plan is to support the viability of this community structure by promoting the sustainable, efficient use of land in these areas. The Town anticipates that many seasonal residents will seek to retire in the Town. This changing demographic will require the town to provide a wide range of housing types and services in the urban area.

The majority of new permanent residential and employment growth it to be directed to the fully serviced Urban Centre, with a target of 80% of new residential dwellings allocated to the fully serviced Urban Centre, and 20% to Rural and Waterfront areas, which rely on private water and sewer services. Development in identified Rural Settlement Areas is intended to be through infilling and minor expansions of existing residential areas within the community. Continued growth in the season/second home market in the Waterfront Areas is also anticipated.

To accommodate anticipated employment growth and accommodate up to 1,690 new employees, sufficient land is to be designated for employment uses and provide a variety of opportunities and options for employment uses throughout the Town.

5.1.2 The District Municipality of Muskoka Growth Strategy (2013)

The District of Muskoka has developed a Growth Strategy which focuses on population, housing and employment forecasts for the district and it's six Municipalities, including the Town of Gravenhurst. The intent of this data is to guide decision making and policy development related to planning and growth management.

A population increase of approximately 4,600 people is expected in the Town by 2041, and the Town's seasonal population is expected to grow by approximately 1,700. The employment growth in the Town is anticipated to be 1,690 jobs by 2041.

The following table outlines the population and employment forecasts allocated to the Town of Gravenhurst.

	2011	2041	Growth 2011-2014
Permanent Population Summary	12,700	17,300	4,600
Seasonal Population Summary	11,900	13,600	1,700
Employment Summary	4,300	5,990	1,690

5.2 Impact of Growth on Lifecycle Activities

By July 1, 2025, the Town'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 Town'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 Town 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 Town is committing approximately $7.1 million towards capital projects per year from sustainable revenue sources
- Given the annual capital requirement of $9.4 million, there is currently a funding gap of $2.3 million annually
- For tax-funded assets, we recommend increasing tax revenues by 1.5% each year for the next 5 years to achieve a sustainable level of funding

6.1 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 Town of Gravenhurst 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 Town's approach to the following:

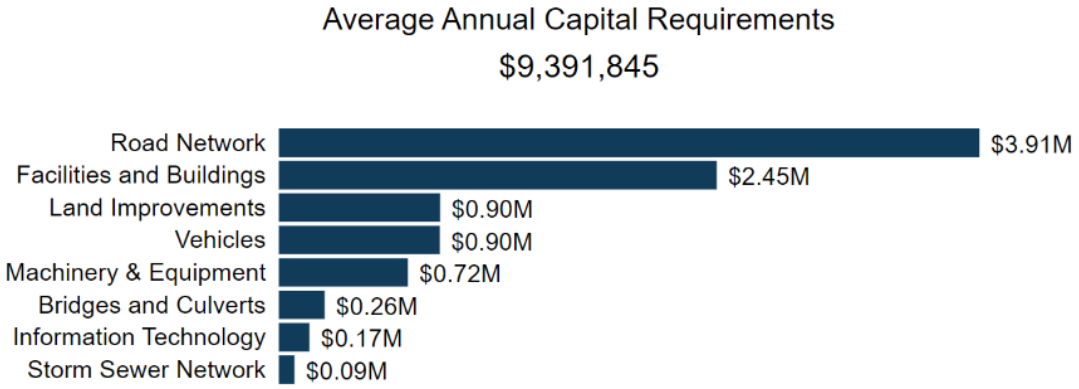
1. In order to reduce financial requirements, consideration has been given to revising service levels downward.

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.

6.1.1 Annual Requirements & Capital Funding

Annual Requirements

The annual requirements represent the amount the Town 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 Town must allocate approximately $9.4 million annually to address capital requirements for the assets included in this AMP.



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

However, for the Road Network and Bridges & Culverts, lifecycle management strategies have been developed to identify capital costs that are realized through strategic rehabilitation and renewal of the Town's roads, bridges, and culverts respectively. The development of these strategies allows for a comparison of potential cost avoidance if the strategies were to be implemented. The following table compares two scenarios for the Road Network and Bridges & Culverts:

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.

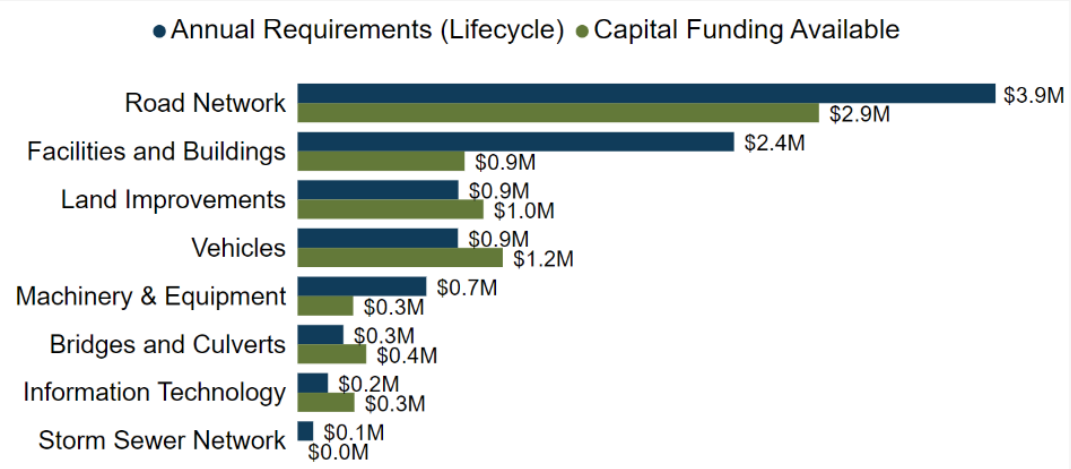
2. **Lifecycle Strategy Scenario**: Based on the assumption that lifecycle activities are performed at strategic intervals to extend the service life of assets until replacement is required.

Asset Category	Annual Requirements (Replacement Only)	Annual Requirements (Lifecycle Strategy)	Difference
Road Network	$11,688,000	$3,911,000	$7,777,000
Bridges & Culverts	$246,000	$256,000	$(10,000)

The implementation of a proactive lifecycle strategy for roads leads to a potential annual cost avoidance of $7.8 million for the Road Network and increase of $10,000 for the Bridges & Culverts. This represents an overall reduction of the annual requirements for the Road Network category by 65% and an increase of 4% for Bridges & Culverts as in this case the lifecycle management activities are needed in order for the assets to reach their estimated useful lives. As the lifecycle strategy scenario represents the lowest cost option available to the Town, we have used these annual requirements in the development of the financial strategy.

Annual Funding Available

Based on a historical analysis of sustainable capital funding sources, the Town is committing approximately $7.1 million towards capital projects per year. Given the annual capital requirement of $9.4 million, there is currently a funding gap of $2.3 million annually.



6.2 Funding Objective

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

1. **Tax Funded Assets:** Road Network, Bridges & Culverts, Storm Sewer Network, Facilities & Buildings, Vehicles, Machinery & Equipment, Land Improvements, and Information Technology.

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, Gravenhurst's average annual asset investment requirements (CapEx), 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	$3,911,000	$2,439,000	$373,000	$110,000	$2,922,000	$989,000
Storm Sewer Network	$88,000				$-	$88,000
Bridges & Culverts	$256,000	$385,000			$385,000	$(129,000)
Facilities & Buildings	$2,445,000	$936,000			$936,000	$1,509,000
Machinery & Equipment	$721,000	$312,000			$312,000	$409,000
Land Improvements	$901,000	$1,041,000			$1,041,000	$(140,000)
Information Technology	$171,000	$318,000			$318,000	$(147,000)
Vehicles	$898,000	$1,150,000			$1,150,000	$(252,000)
	$9,391,000	**$6,581,000**	**$373,000**	**$110,000**	**$7,064,000**	**$2,327,000**

The average annual investment requirement for the above categories is approximately $9.4 million. Annual revenue currently allocated to these assets for capital purposes is approximately $7.1 million leaving an annual deficit of about $2.3 million. Put differently, these infrastructure categories are currently funded at 75.2% of their long-term requirements.

6.3.2 Full Funding Requirements

In 2020, Town of Gravenhurst has annual tax revenues of $16.95 million. As illustrated in the following table, without consideration of any other sources of revenue or cost containment strategies, full funding would require the following tax change over time:

Asset Category	Tax Change Required for Full Funding
Road Network	5.8%
Storm Sewer Network	0.5%
Bridges & Culverts	-0.8%
Facilities & Buildings	8.9%
Machinery & Equipment	2.4%
Land Improvements	-0.8%
Information Technology	-0.9%
Vehicles	-1.5%
	13.6%

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

a) Gravenhurst's formula based OCIF grant is scheduled to remain constant at $110,245 in 2020 and 2021.
b) Gravenhurst's debt payments for these asset categories will be decreasing by $1,019,000 over the next 5, 10 and 15 years. Although not shown in the table, debt payment decreases will be $1,199,000 over the next 20 years.

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

	Without Capturing Changes				With Capturing Changes			
	5 Years	10 Years	15 Years	20 Years	5 Years	10 Years	15 Years	20 Years
Infrastructure Deficit	$2,327,000	$2,327,000	$2,327,000	$2,327,000	$2,327,000	$2,327,000	$2,327,000	$2,327,000
Change in Debt Costs	n/a	n/a	n/a	n/a	$(1,019,000)	$(1,019,000)	$(1,019,000)	$(1,019,000)
Change in OCIF Grants					$-	$-	$-	$-
Resulting Infrastructure Deficit Closure Time:	**5**	**10**	**15**	**20**	**5**	**10**	**15**	**20**
Tax Increase Required	13.7%	13.7%	13.7%	13.7%	7.7%	7.7%	7.7%	7.7%
Annually:	**2.7%**	**1.3%**	**0.9%**	**0.7%**	**1.5%**	**0.8%**	**0.5%**	**0.4%**

6.3.3 Financial Strategy Recommendations

Considering all the above information, we recommend the 5-year option. This involves full CapEx funding being achieved over 5 years by:

c) when realized, reallocating the debt cost reductions to the infrastructure deficit as outlined above.
d) increasing tax revenue by 1.5% each year for the next 5 years solely for the purpose of phasing in full funding to the asset categories covered in this section of the AMP.
e) adjusting tax revenue increases in future year(s) when allocations to CapEx exceed or fail to meet budgeted amounts.
f) allocating the current gas tax and OCIF revenue as outlined previously.
g) allocating the scheduled OCIF grant increases to the infrastructure deficit as they occur.
h) reallocating appropriate revenue from categories in a surplus position to those in a deficit position.
i) increasing existing and future infrastructure budgets by the applicable inflation index on an annual basis in addition to the deficit phase-in.

Notes:

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

Although this option achieves full CapEx funding on an annual basis in 5 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 $3,168,000 for Facilities and Buildings, $444,000 for Information Technology, $2,191,000 for Land Improvements, $3,450,000 for Machinery & Equipment, $2,243,000 for Road Network, and $3,461,000 for Vehicles.

[1] The Town 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. This review may impact its availability.

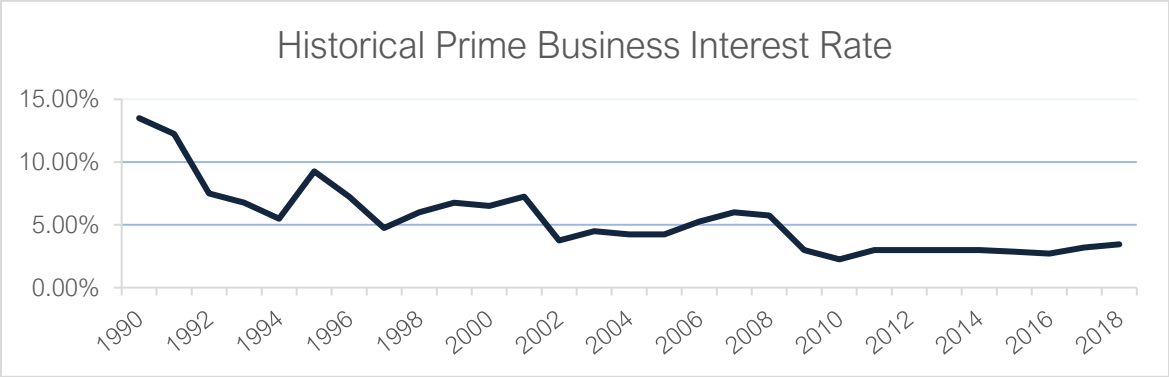
Prioritizing future projects will require the current data to be replaced by condition-based data. Although our recommendations include no further use of debt, the results of the condition-based analysis may require otherwise.

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%[2] over 15 years would result in a 26% premium or $260,000 of increased costs due to interest payments. For simplicity, the table does not 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:



[2] 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 Gravenhurst has historically used debt for investing in the asset categories as listed. There is currently $13,958,000 of debt outstanding for the assets covered by this AMP with corresponding principal and interest payments of $1,562,000, well within its provincially prescribed maximum of $5,336,000.

Asset Category	Current Debt Outstanding	Use of Debt in the Last Five Years				
		2016	2017	2018	2019	2020
Road Network	$0	$0	$0	$0	$0	$0
Storm Sewer Network	$0	$0	$0	$0	$0	$0
Bridges & Culverts	$0	$0	$0	$0	$0	$0
Facilities & Buildings	$13,958,000					
Machinery & Equipment	$0	$0	$0	$0	$0	$0
Land Improvements	$0	$0	$0	$0	$0	$0
Information Technology	$0	$0	$0	$0	$0	$0
Vehicles	$0	$0	$0	$0	$0	$0
Total Tax Funded:	**$13,958,000**	**$0**	**$0**	**$0**	**$0**	**$0**

Asset Category	Principal & Interest Payments in the Next Ten Years						
	2021	2022	2023	2024	2025	2026	2031
Road Network	$0	$0	$0	$0	$0	$0	$0
Storm Sewer Network	$0	$0	$0	$0	$0	$0	$0
Bridges & Culverts	$0	$0	$0	$0	$0	$0	$0
Facilities & Buildings	$1,562,000	$1,562,000	$1,562,000	$4,987,000	$543,000	$543,000	$543,000
Machinery & Equipment	$0	$0	$0	$0	$0	$0	$0
Land Improvements	$0	$0	$0	$0	$0	$0	$0
Information Technology	$0	$0	$0	$0	$0	$0	$0
Vehicles	$0	$0	$0	$0	$0	$0	$0
Total Tax Funded:	**$1,562,000**	**$1,562,000**	**$1,562,000**	**$4,987,000**	**$543,000**	**$543,000**	**$543,000**

The revenue options outlined in this plan allow Gravenhurst 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 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 Gravenhurst.

Asset Category	Balance on December 31, 2020
Road Network	$2,479,000
Storm Sewer Network	$0
Bridges & Culverts	$0
Facilities & Buildings	$2,050,000
Machinery & Equipment	$0
Land Improvements	$0
Information Technology	$297,000
Vehicles	$533,000
Total Tax Funded:	**$5,359,000**

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

6.5.2 Recommendation

In 2025, Ontario Regulation 588/17 will require Gravenhurst 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 reserves.

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	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Curbs	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Gravel/Unpaved	$0	$11,701	$14,464	$11,008	$18,065	$14,473	$11,016	$18,075	$14,563	$10,899	$18,084
HCB	$0	$1,292	$83,956	$5,209	$1,598,895	$875,925	$956,795	$552,718	$636,960	$30,923	$16,443
LCB	$0	$2,858	$7,336	$7,144	$5,860	$28,507	$9,544	$15,689	$7,431	$5,722	$27,874
Sidewalks	$97,237	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Streetlights	$1,803,557	$0	$0	$0	$708,677	$0	$668,599	$0	$0	$0	$687,589
	$1,900,794	**$15,851**	**$105,757**	**$23,361**	**$2,331,497**	**$918,906**	**$1,645,954**	**$586,482**	**$658,954**	**$47,543**	**$749,991**

Bridges & Culverts

Asset Segment	Backlog	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Bridges	$0	$0	$7,500	$450,000	$202,000	$31,000	$28,000	$0	$0	$0	$0
Structural Culverts	$0	$0	$0	$0	$0	$0	$0	$232,000	$0	$0	$0
	$0	**$0**	**$7,500**	**$450,000**	**$202,000**	**$31,000**	**$28,000**	**$232,000**	**$0**	**$0**	**$0**

Storm Sewer Network											
Asset Segment	Backlog	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Catch Basins	$0	$0	$0	$0	$0	$0	$0	$0	$60,500	$0	$0
Grit Seperators	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Manholes	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Storm Ponds	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Storm Sewer	$0	$0	$0	$0	$0	$0	$0	$0	$73,178	$0	$0
Subdrains	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	$0	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$133,678**	**$0**	**$0**

Facilities & Buildings											
Asset Segment	Backlog	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
General Government	$71,000	$0	$178,000	$37,000	$2,204,850	$33,000	$0	$0	$0	$29,568	$518,757
Health Services	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Protection Services	$1,145,000	$0	$0	$0	$1,687,000	$0	$0	$0	$26,750	$50,549	$111,883
Recreation & Cultural Services	$1,819,000	$0	$0	$0	$9,791,483	$0	$1,170,891	$0	$1,002,855	$109,776	$3,024,910
Transportation Services	$133,000	$0	$0	$0	$370,650	$672,000	$0	$0	$4,481	$0	$0
	$3,168,000	**$0**	**$178,000**	**$37,000**	**$14,053,983**	**$705,000**	**$1,170,891**	**$0**	**$1,034,086**	**$189,893**	**$3,655,550**

Machinery & Equipment											
Asset Segment	Backlog	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Communication Equipment	$187,193	$12,039	$117,396	$0	$0	$0	$0	$5,922	$0	$0	$0
Docks and Launches	$192,805	$0	$26,663	$6,756	$0	$0	$0	$0	$14,791	$139,399	$152,718
Indoor Furniture & Equipment	$1,105,605	$12,084	$436,688	$54,950	$203,994	$0	$9,113	$65,114	$69,143	$41,539	$53,188
Library Services	$33,546	$0	$65,396	$57,649	$59,378	$50,158	$56,044	$56,176	$60,530	$64,560	$142,752
Major Equipment	$725,738	$52,000	$68,377	$0	$8,701	$0	$27,448	$10,481	$167,755	$0	$275,000
Mechanical & Electrical Equipment	$97,175	$2,834	$2,549	$0	$15,836	$4,345	$37,128	$0	$0	$63,855	$71,165
Minor Equipment	$61,013	$11,611	$0	$0	$0	$0	$0	$0	$0	$0	$0
Outdoor Furniture & Fixtures	$1,042,112	$0	$10,336	$23,034	$0	$8,918	$0	$690	$33,130	$0	$0
Radio Services	$4,343	$0	$1,146	$4,328	$13,078	$1,294	$155,129	$0	$0	$0	$0
Uniforms and Gears	$0	$0	$18,186	$27,147	$120,858	$23,922	$23,458	$26,698	$0	$0	$13,452
	$3,449,530	**$90,568**	**$746,737**	**$173,864**	**$421,845**	**$88,637**	**$308,320**	**$165,081**	**$345,349**	**$309,354**	**$708,275**

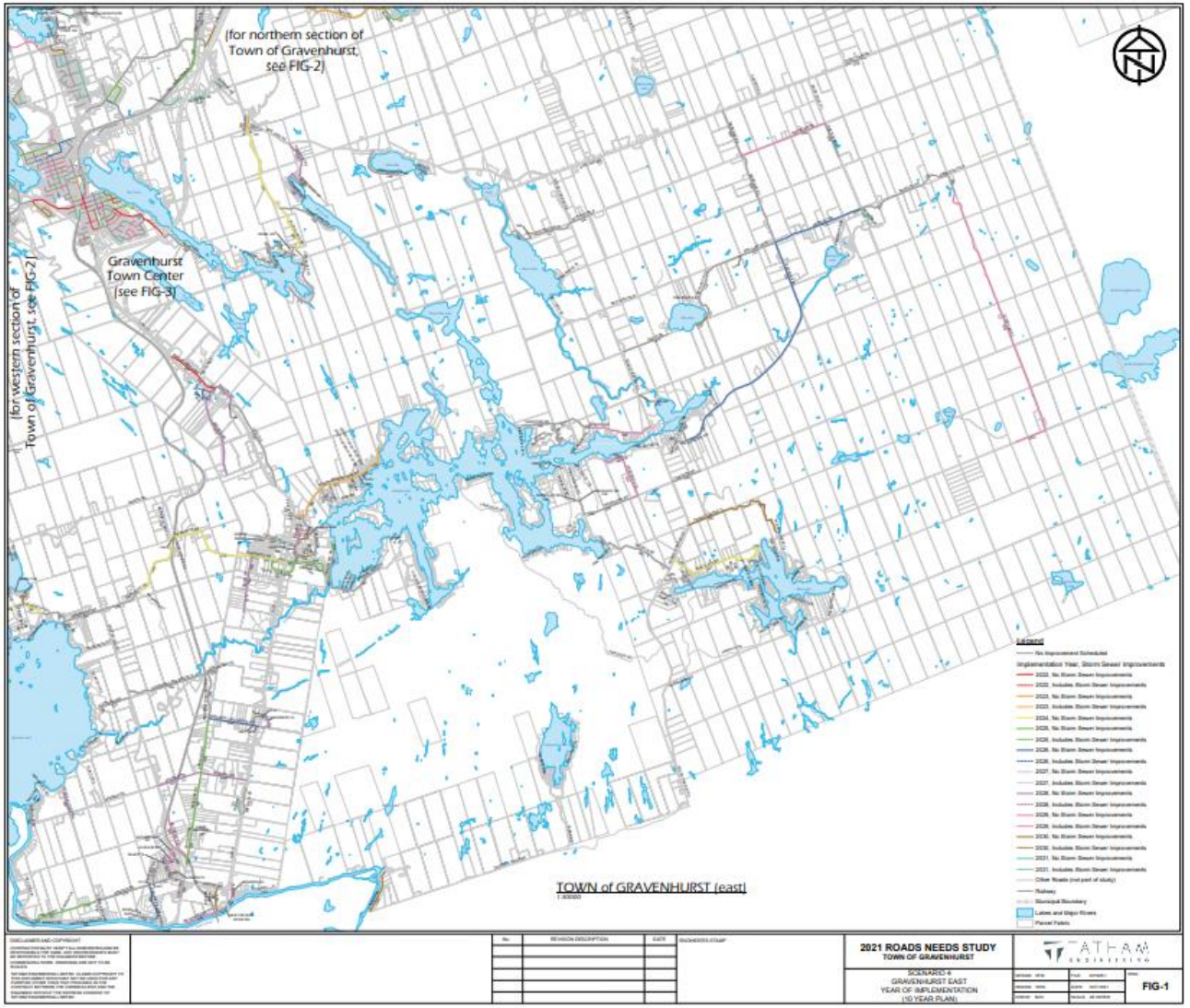
Information Technology											
Asset Segment	Backlog	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Hardware	$47,800	$26,700	$20,300	$21,800	$74,500	$20,300	$21,800	$74,500	$20,300	$21,800	$74,500
Sofware	$395,950	$0	$0	$0	$395,950	$0	$0	$395,950	$0	$0	$395,950
	$443,750	**$26,700**	**$20,300**	**$21,800**	**$470,450**	**$20,300**	**$21,800**	**$470,450**	**$20,300**	**$21,800**	**$470,450**

Vehicles											
Asset Segment	Backlog	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Boats	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Fire & Emergency Services	$850,000	$0	$0	$500,000	$450,000	$500,000	$0	$0	$450,000	$0	$0
Heavy Vehicles	$1,600,000	$0	$250,000	$0	$300,000	$250,000	$0	$268,548	$0	$0	$657,954
Light Vehicles	$735,500	$135,000	$0	$65,000	$246,000	$275,104	$870,500	$0	$65,000	$246,000	$275,104
Tractors	$141,000	$0	$0	$0	$0	$0	$0	$0	$90,000	$0	$50,660
Trailers	$134,500	$0	$0	$0	$0	$0	$134,500	$0	$0	$0	$0
	$3,461,000	**$135,000**	**$250,000**	**$565,000**	**$996,000**	**$1,025,104**	**$1,005,000**	**$268,548**	**$605,000**	**$246,000**	**$983,718**

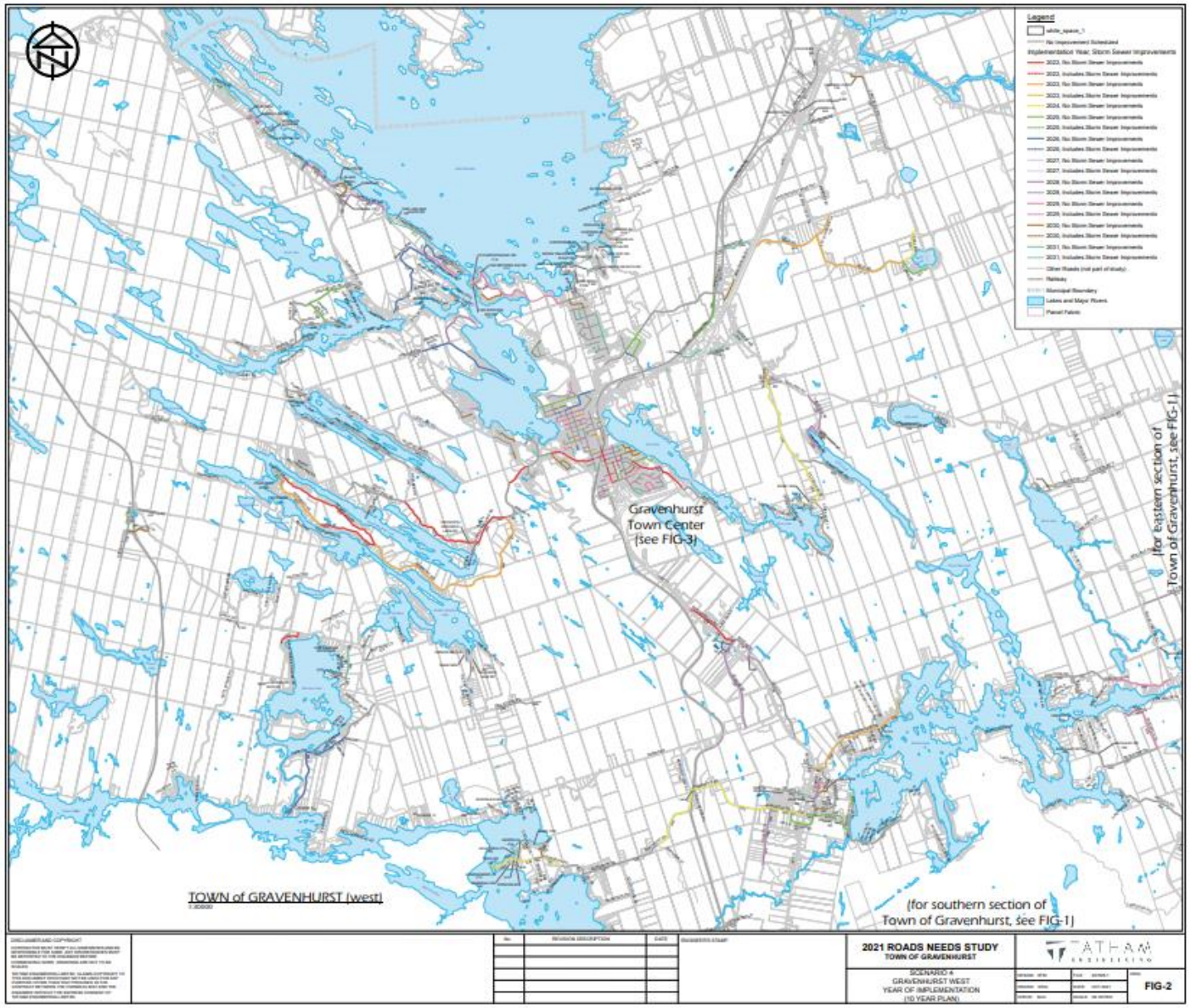
Land Improvements											
Asset Segment	Backlog	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
General Government	$0	$16,396	$238,309	$0	$0	$0	$0	$0	$0	$0	$0
Parks and Recreation & Cultural Services	$1,889,580	$87,345	$89,326	$139,958	$126,952	$70,555	$5,403,482	$5,022	$128,696	$549,901	$160,626
Public Works	$112,545	$0	$0	$50,000	$0	$0	$0	$0	$0	$0	$0
Transportation Services	$188,516	$0	$0	$184,000	$0	$0	$2,261,550	$0	$37,508	$0	$836,492
	$2,190,641	**$103,741**	**$327,635**	**$373,958**	**$126,952**	**$70,555**	**$7,665,032**	**$5,022**	**$166,204**	**$549,901**	**$997,118**

Appendix B: Level of Service Maps

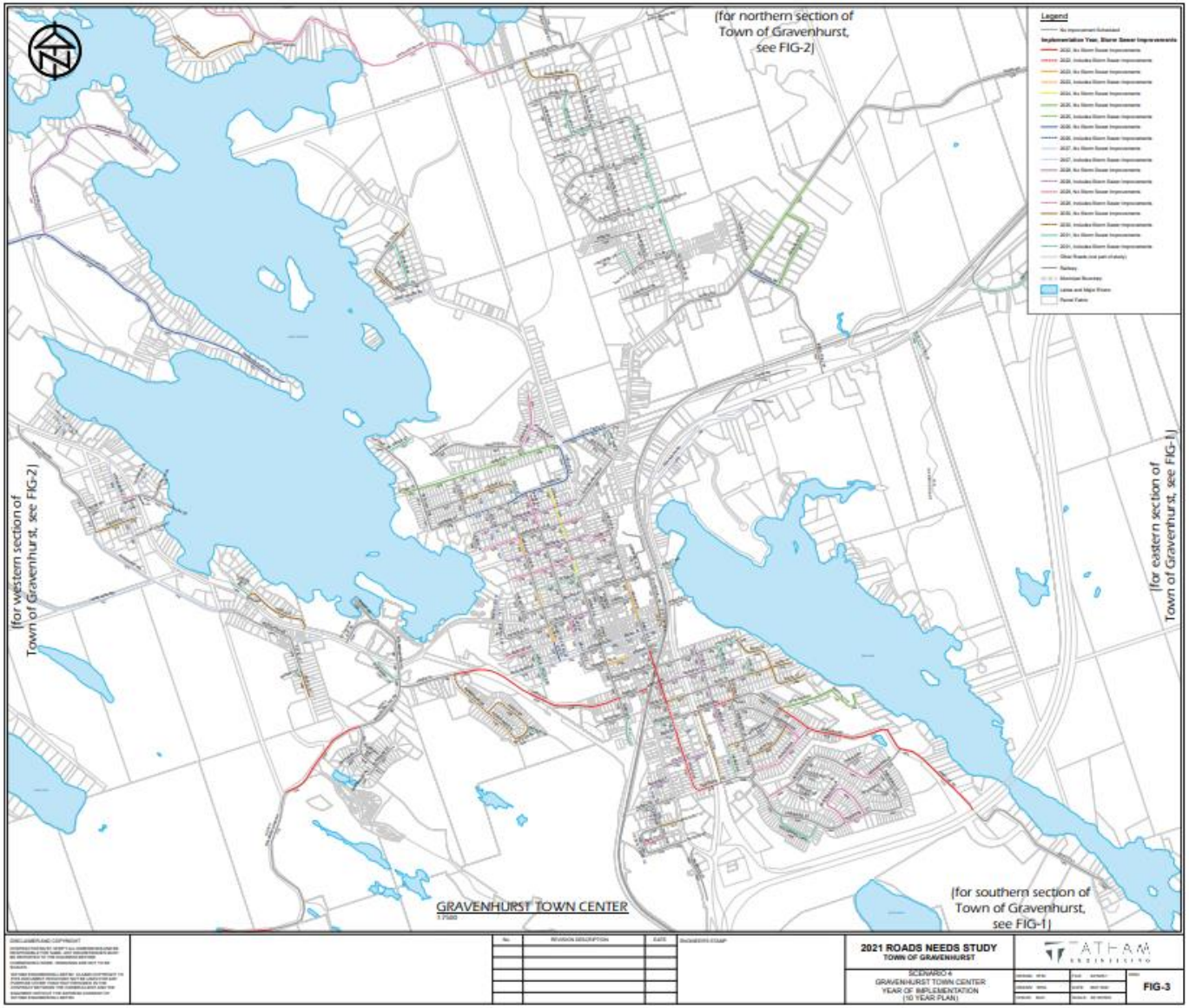
Road Network Map – Gravenhurst East



Road Network Map – Gravenhurst West



Road Network Map – Gravenhurst Town Center

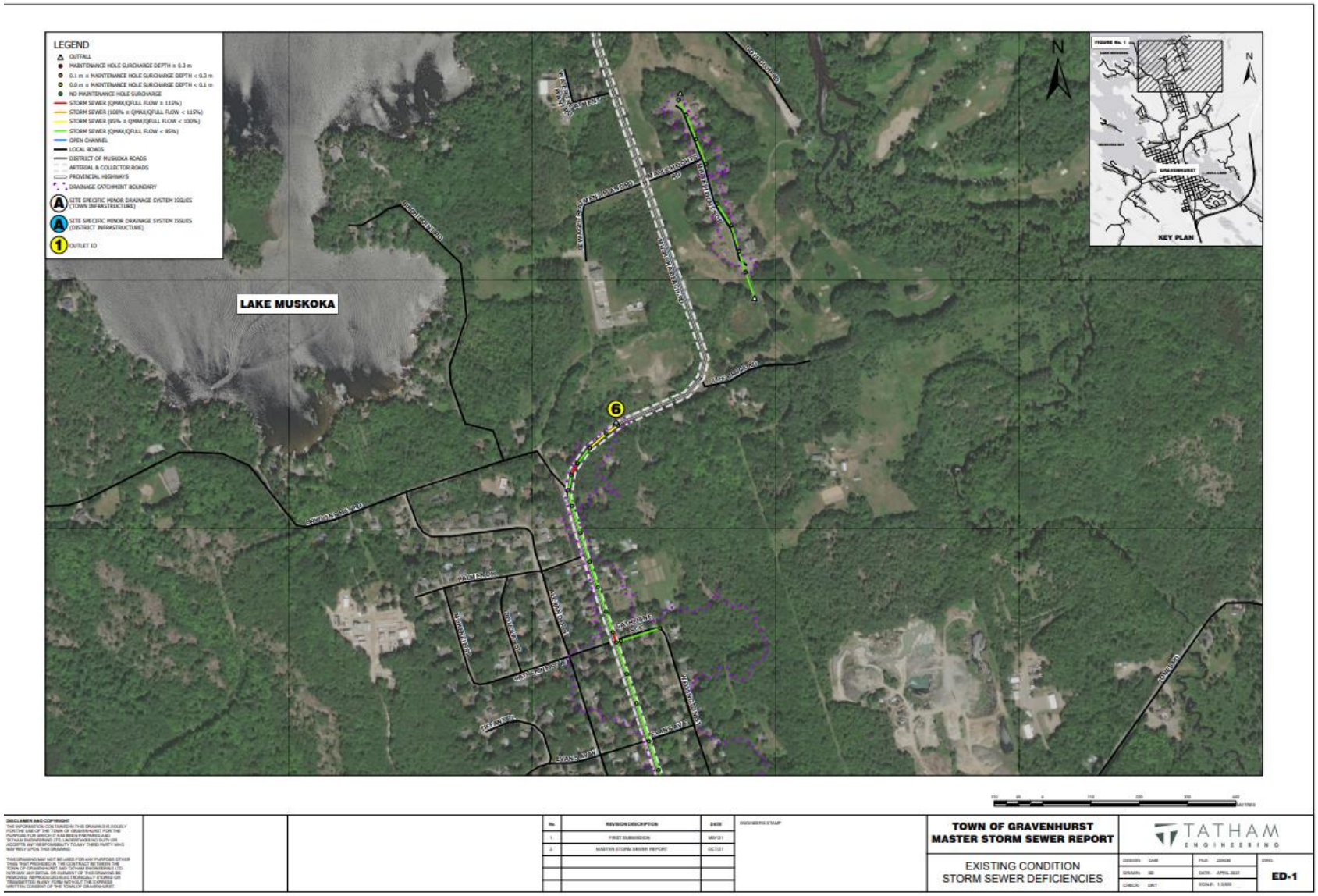


Images of Bridge in Very Good Condition
Robinson Bridge
Inspected: August 7th, 2021

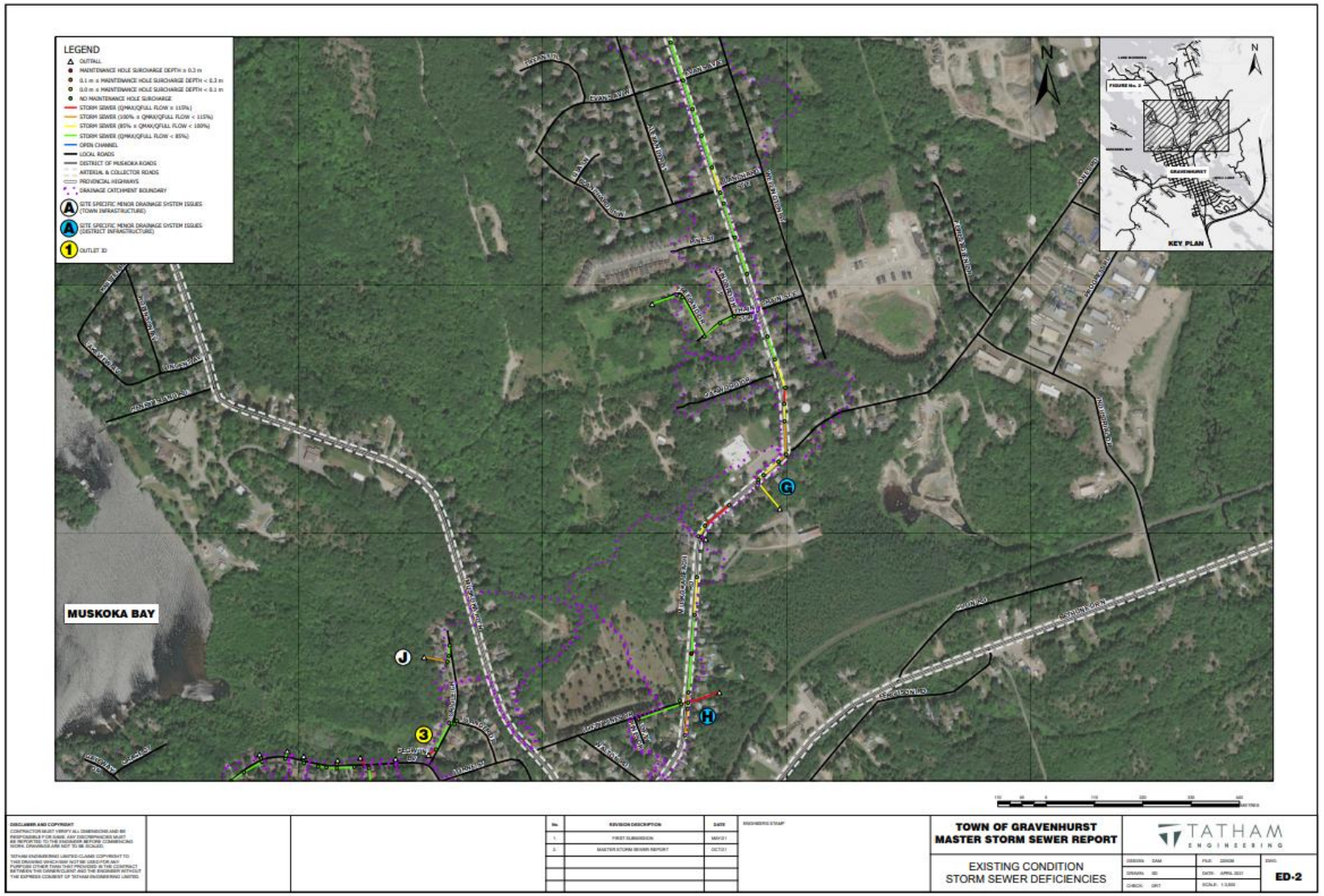
Images of Bridge in Fair Condition
Pinetree Road Bridge
Inspected: August 7th, 2021

Images of Culvert in Very Good Condition
Sniders Bay Culvert
Inspected: August 7th, 2021

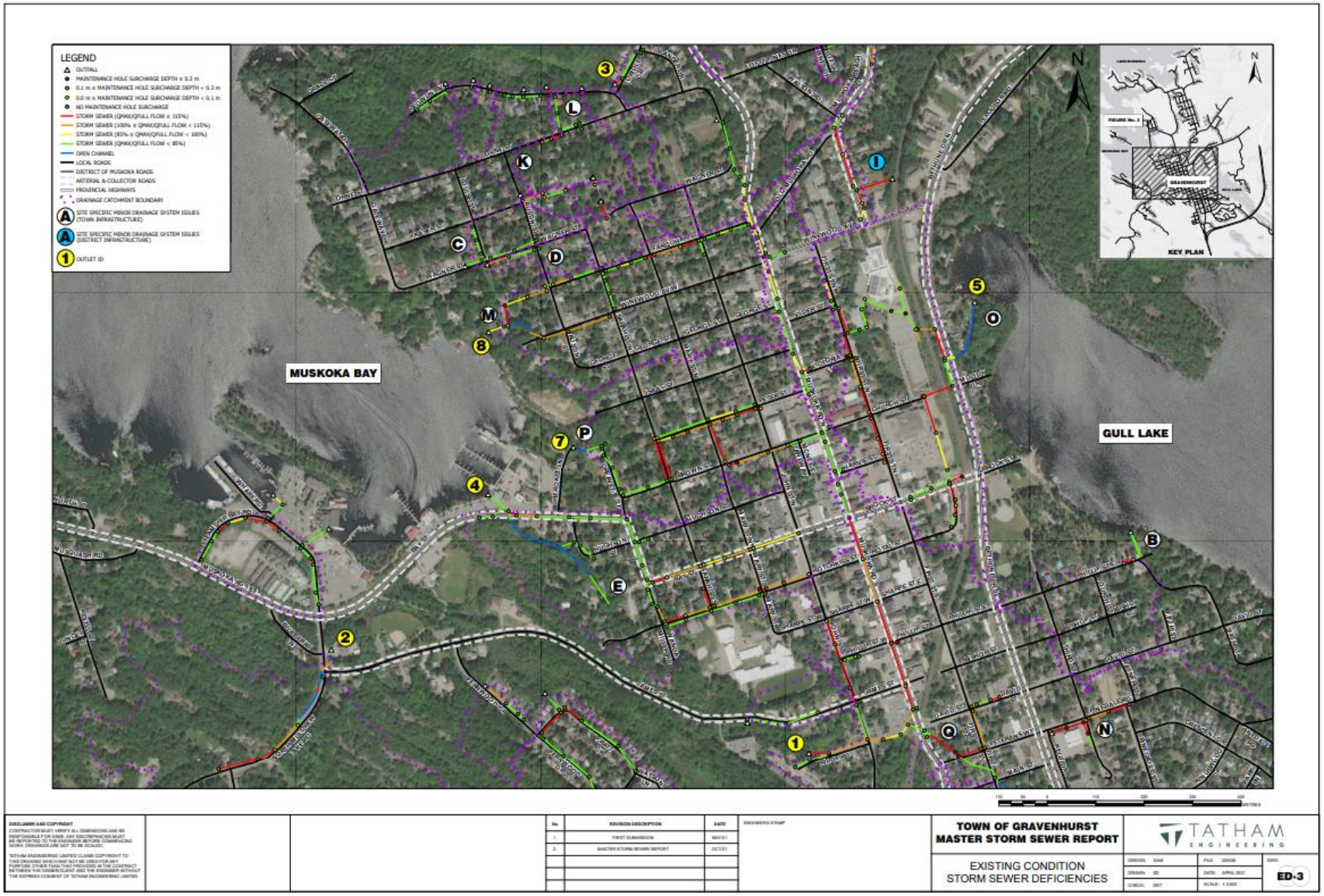
Storm sewer Network Map – Part 1



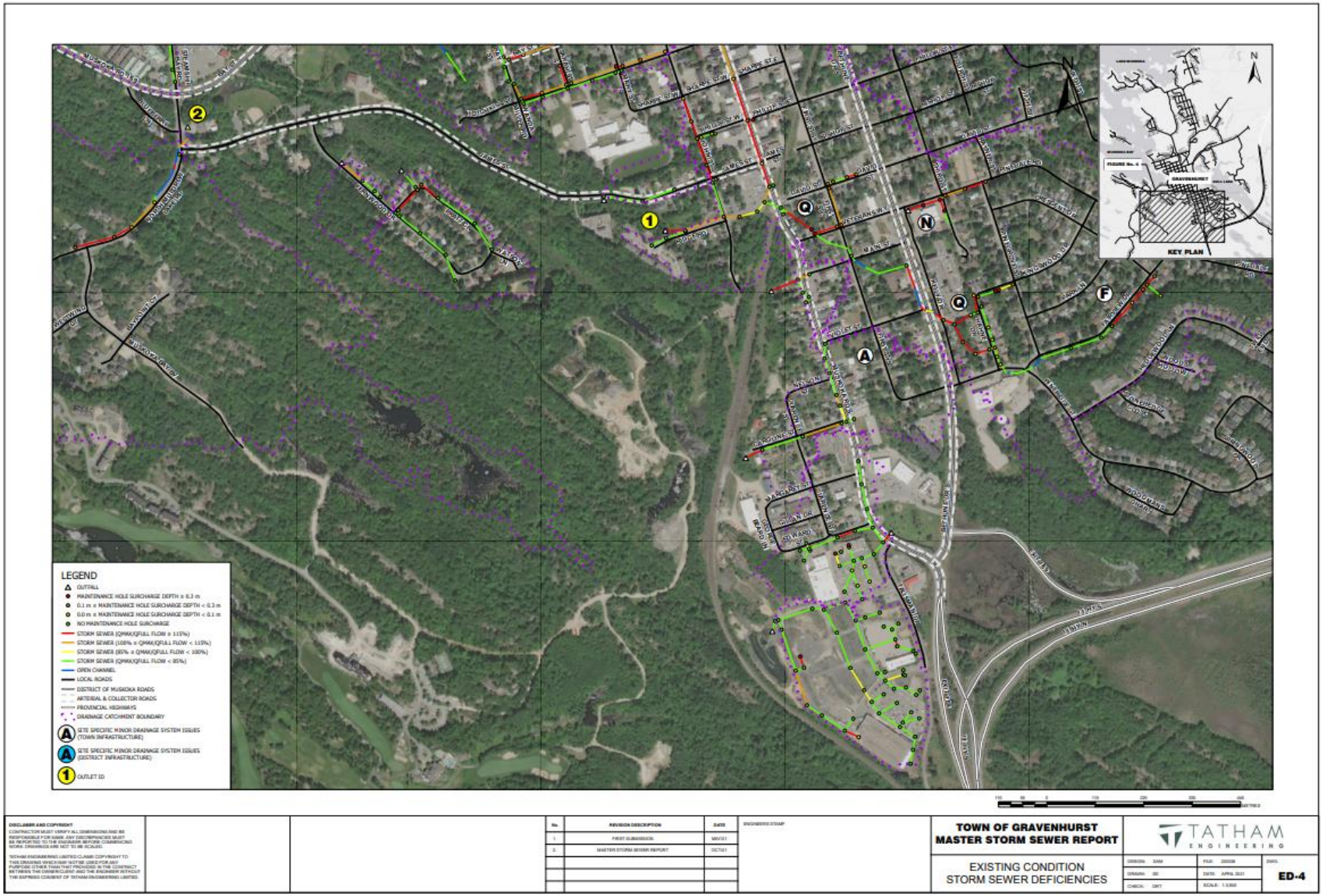
Storm sewer Network Map – Part 2



Storm sewer Network Map – Part 3



Storm sewer Network Map – Part 4



Appendix C: Risk Rating Criteria

Probability of Failure

Asset Category	Risk Criteria	Criteria Weighting	Value/Range	Probability of Failure Score
Bridges & Culverts	Condition	90%	0-19	5
			20-39	4
			40-59	3
			60-79	2
			80-100	1
	Loading Requirements	10%	TBD[3]	
Road Network (Gravel Roads, HCB & LCB)	Condition	70%	0-19	5
			20-39	4
			40-59	3
			60-79	2
			80-100	1
	Drainage Adequency	20%	Good	2
			Fair	3
			Poor	4
	PCR	7%	Excellent	1
			Very Good	2
			Good	2
			Fair	3
			Poor	4
	2021 Utilization	3%	0.25	1
			0.5	2
			0.75	3
			1	4
			2	5

[3] Loading requirements for bridges would like to be used in future by staff in probability of failure

Asset Category	Risk Criteria	Criteria Weighting	Value/Range	Probability of Failure Score
Storm Sewer Network (Storm Sewers)	Condition	90%	0-19	5
			20-39	4
			40-59	3
			60-79	2
			80-100	1
	Material	10%	Concrete Pipe	1
			Polyethylene	1
			Polypropylene	1
			Polyvinyl Chloride	1
			Steel Pipe	5
Facilities & Buildings, Information Technology, Machinery & Equipment, Road Network (all other assets), Storm Sewer Network (All other assets), Land Improvements, Vehicles	Condition	70%	0-19	5
			20-39	4
			40-59	3
			60-79	2
			80-100	1

Consequence of Failure

Asset Category	Risk Classification	Risk Criteria	Value/Range	Consequence of Failure Score
Road Network (Gravel Roads, HCB & LCB)	Economic (80%)	Replacement Cost (100%)	$0-100,000	1
			$100,001-250,000	2
			$250,001-500,000	3
			$500,001-1,000,000	4
			$1,000,001+	5
	Social (20%)	2021 AADT (100%)	0-100	1
			101-250	2
			251-500	3
			501-1,000	4
			1,000-10,000	5
Land Improvements	Economic (90%)	Replacement Cost (100%)	$0-$50,000	1
			$50,001-$100,000	2
			$100,001-$250,000	3
			$250,001-$500,000	4
			$500,001+	5
	Social (10%)	Number of Vistors (100%)	TBD[4]	
Vehicles	Economic (80%)	Replacement Cost (100%)	$0-$50,000	1
			$50,001-$100,000	2
			$100,001-$250,000	3
			$250,001-$500,000	4
			$500,001+	5
	Health and Safety (20%)	Department (100%)	Building	2
			By Law	2
			Infastructure Services	2
			Recreation & Cultural Servics	2
			Fire & Emergency Services	5

[4] Number of visitors is not presently tracked but staff would like to track in future.

Asset Category	Risk Classification	Risk Criteria	Value/Range	Consequence of Failure Score
Storm Sewer Network (Storm Sewers)	Economic (80%)	Replacement Cost (100%)	$0-100,000	1
			$100,001-250,000	2
			$250,001-500,000	3
			$500,001-1,000,000	4
			$1,000,001+	5
	Operational (20%)	Pipe Diamter (100%)	0-200	1
			201-300	2
			301-525	3
			526-600	4
			601-1,000	5
Facilities & Buildings, Machinery & Equipment, Information Technology	Economic (10%)	Replacement Cost (100%)	$0-$50,000	1
			$50,001-$100,000	2
			$100,001-$250,000	3
			$250,001-$500,000	4
			$500,001+	5
Bridges & Culverts, Road Network (all other assets), Storm Sewer Network (all other assets)	Economic (10%)	Replacement Cost (100%)	$0-100,000	1
			$100,001-250,000	2
			$250,001-500,000	3
			$500,001-1,000,000	4
			$1,000,001+	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 Town'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 Town'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 Town 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 Town 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 Town 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 Town 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: Storm Water Network Deficiencies

The drainage system deficiencies were established according to the *District's Engineering Design Criteria and Standards Manual*. The deficiencies are presented on the Existing Condition Storm Sewer Deficiencies maps (Drawings ED-1 through ED-4) and Climate Change Scenario Storm Sewer Deficiencies maps (Drawings ED-5 through ED-8) enclosed in Appendices E and F and are described further in the following sections.

Within the Study Area, the following roads are District roads and are subject to District design criteria:

- Muskoka Beach Road;
- Muskoka Road North and South;
- Bethune Drive;
- Winewood Avenue East;
- Brock Street; and
- Bay Street.

On District roads the following design criteria applies to storm sewers:

- Minimum storm sewer diameter is 300 mm;
- Minimum pipe slope is 0.5% except for large diameter trunk sewers where constraints necessitate a shallower slope; and
- The minor system (storm sewer) in urban commercial developments on local roads are to be designed to convey the 1:10-year return frequency design storm peak flow.

For storm sewers greater than 600 mm diameter, a minimum pipe slope of 0.20% has been applied to identify deficiencies which is consistent with criteria applied in other drainage studies and is more conservative than the MECP Design Guidelines for Sewage Works.
On Town roads, the following design criteria applies to storm sewers:

- Minimum storm sewer diameter is 250 mm;
- Minimum/maximum pipe slopes shall be in accordance with MECP Design Guidelines for Sewage Works;

- For roads classified as urban, the storm sewer must convey the 1:10-year return frequency design storm peak flow; and
- For roads classified as suburban, industrial or commercial, the storm sewer must convey the 1:5-year return frequency design storm peak flow.

The only Town road for which storm sewer must convey the 1:10-year return frequency design storm peak flow is James Street which is identified as a Collector Road.

For this assessment, the storm sewer has been characterized as follows based on conveyance capacity:

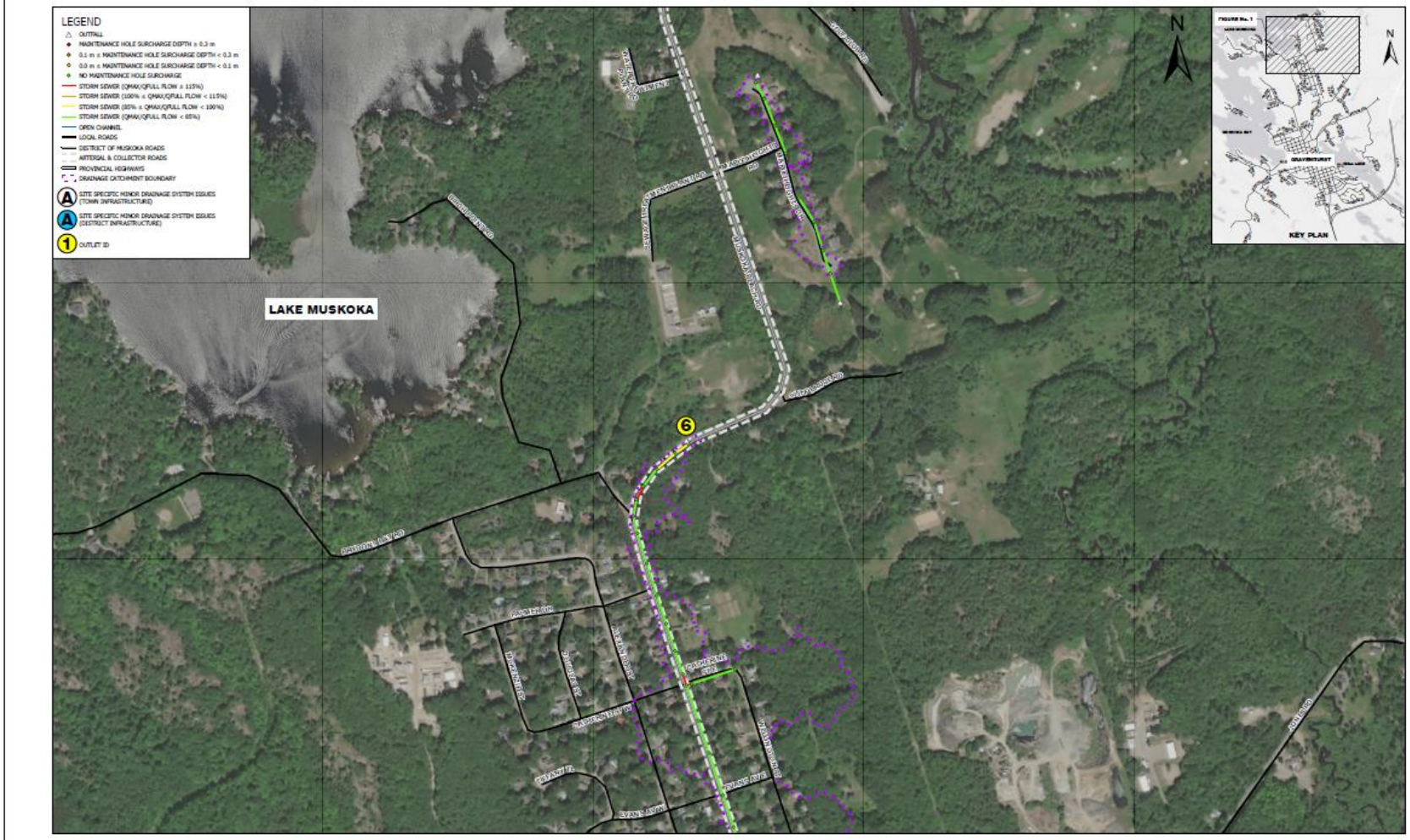
1. Peak Flow/Storm Sewer Full Flow Capacity (Qmax/Qfullflow) < 85% - storm sewer capacity exceeds design storm peak flow (storm sewer has adequate capacity) by greater than 15% and satisfies the current municipal conveyance criteria.
2. 85% <= Peak Flow/Storm Sewer Full Flow Capacity (Qmax/Qfullflow) < 100% - storm sewer capacity exceeds design storm peak flow (storm sewer has adequate capacity) by less than 15%. As such, the peak flow is approaching full flow capacity.
3. 100% <= Peak Flow/Storm Sewer Full Flow Capacity (Qmax/Qfullflow) < 115% - design storm peak flow exceeds storm sewer capacity (deficient conveyance capacity) by up to 15% - moderate exceedance.
4. Peak Flow/Storm Sewer Full Flow Capacity (Qmax/Qfullflow) >= 115% - design storm peak flow exceeds storm sewer capacity (deficient conveyance capacity) by greater than 15% - severe exceedance.

Similarly, the storm maintenance holes have been characterized as follows based on maintenance hole surcharging:

1. Maintenance Hole Surcharging < 0 m – no overland flow.

2. 0 m <= Maintenance Hole Surcharging < 0.1 m - minimal overland flow depth.

3. 0.1 m <= Maintenance Hole Surcharging < 0.3 m - overland flow depth satisfies safe access/egress criteria.
4. Maintenance Hole Surcharging >= 0.3 m - overland flow depth exceeds safe access/egress criteria.



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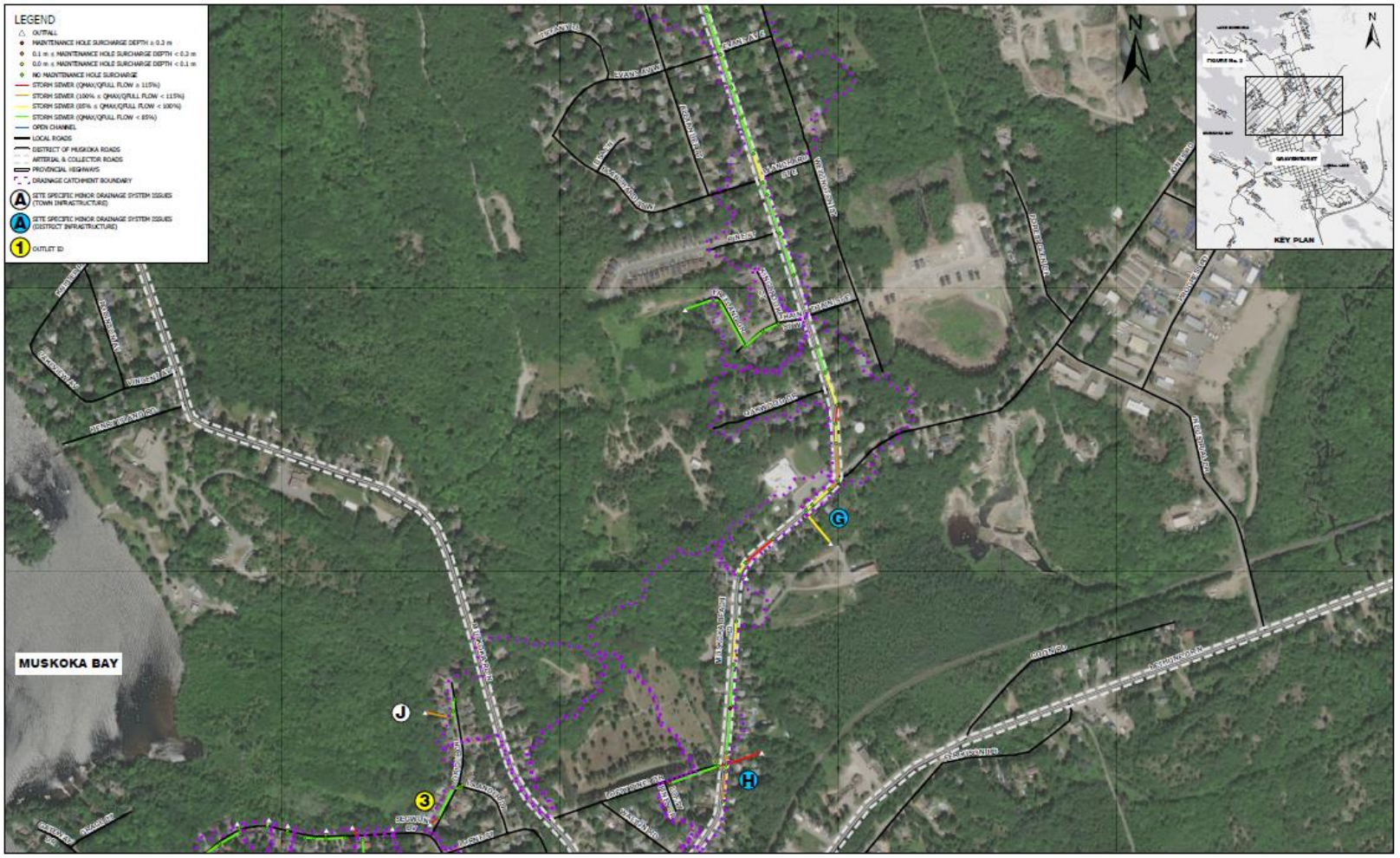
ED-1



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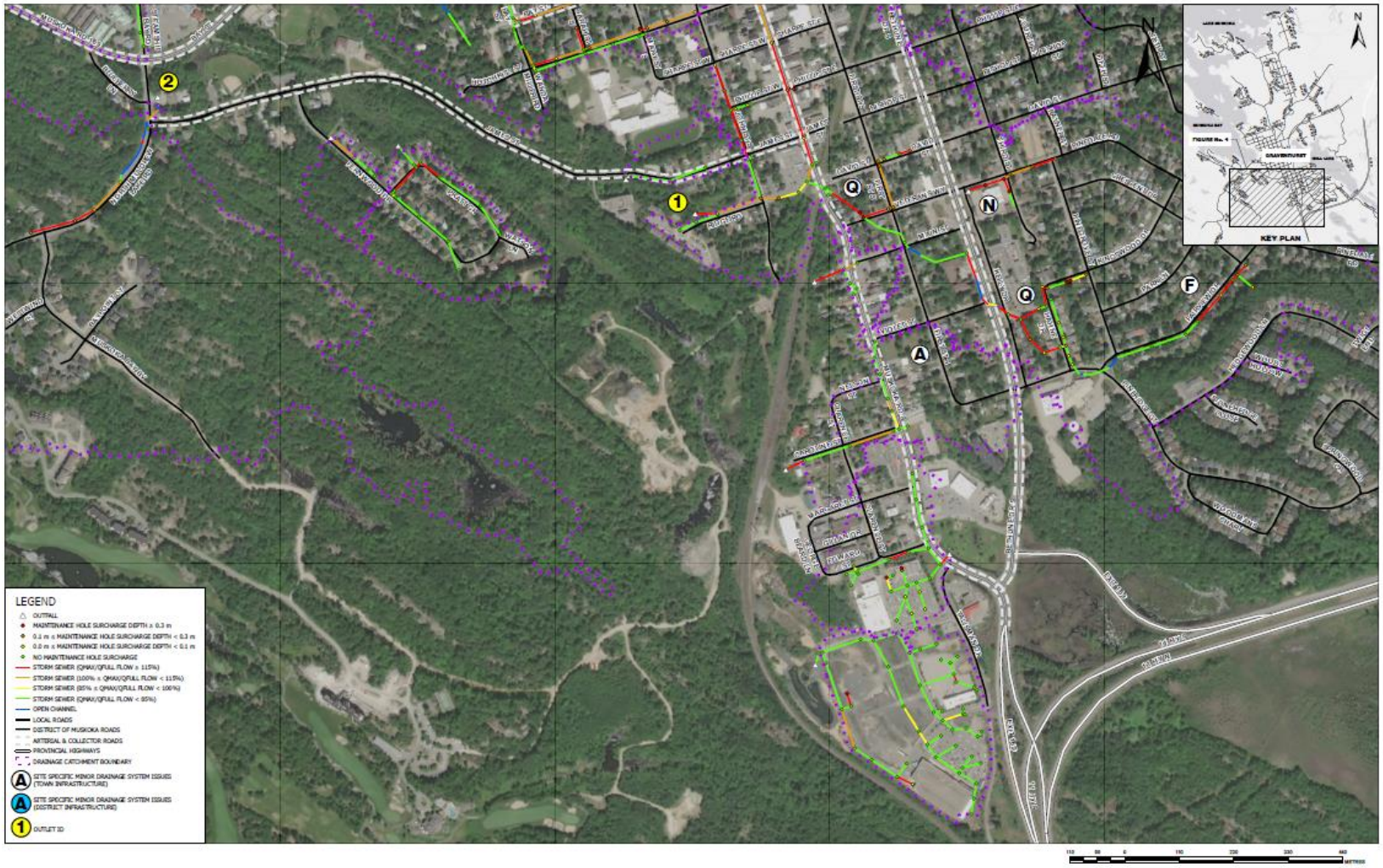

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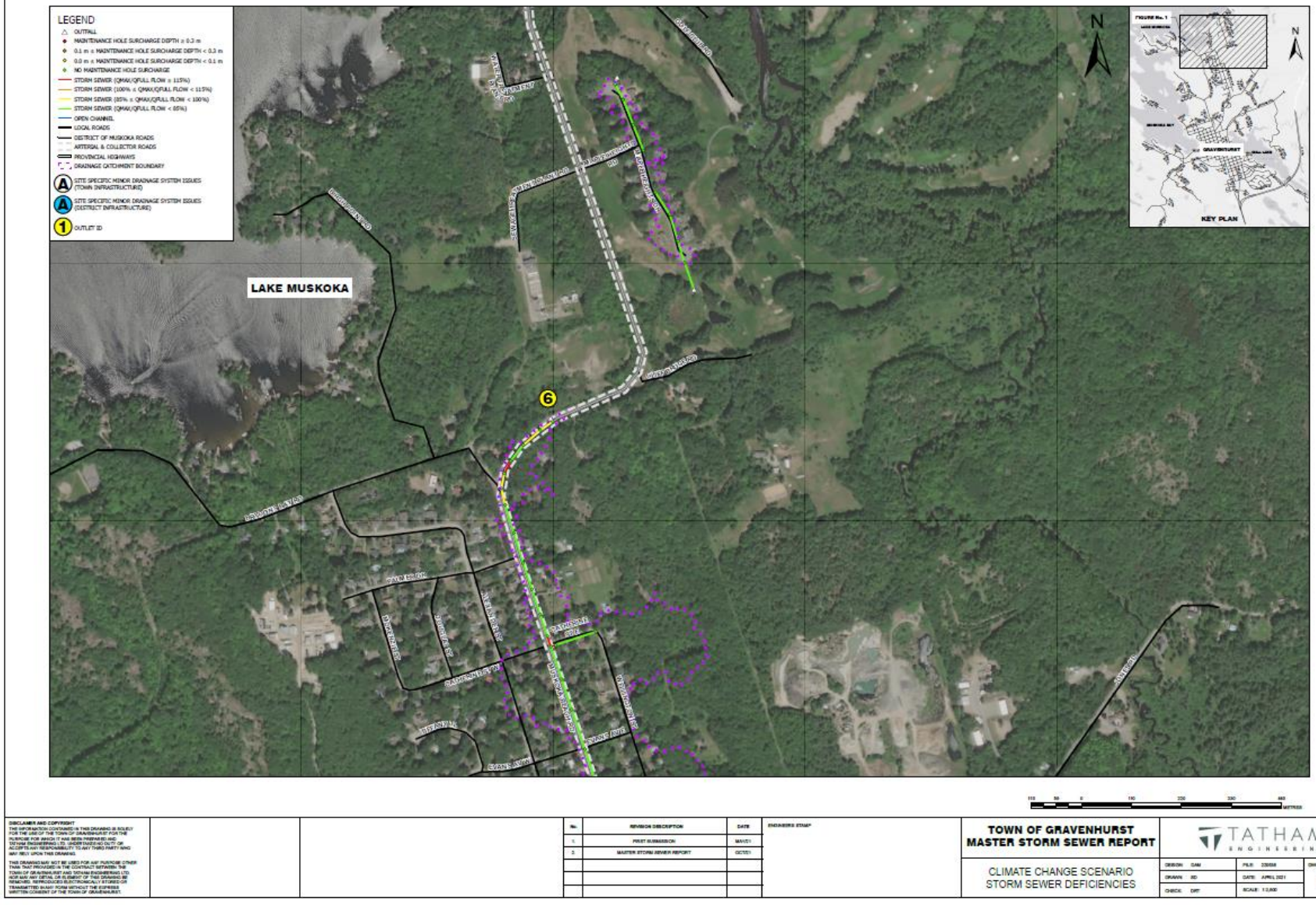
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0.1 m ≤ MAINTENANCE HOLE SURCHARGE DEPTH < 0.3 m
0.0 m ≤ MAINTENANCE HOLE SURCHARGE DEPTH < 0.1 m
NO MAINTENANCE HOLE SURCHARGE
STORM SEWER (QMAX/QFULL FLOW ≥ 115%)
STORM SEWER (100% ≤ QMAX/QFULL FLOW < 115%)
STORM SEWER (85% ≤ QMAX/QFULL FLOW < 100%)
STORM SEWER (QMAX/QFULL FLOW < 85%)
OPEN CHANNEL
LOCAL ROADS
DISTRICT OF MUSKOKA ROADS
ARTERIAL & COLLECTOR ROADS
PROVINCIAL HIGHWAYS
DRAINAGE CATCHMENT BOUNDARY
SITE SPECIFIC MINOR DRAINAGE SYSTEM ISSUES (TOWN INFRASTRUCTURE)
SITE SPECIFIC MINOR DRAINAGE SYSTEM ISSUES (DISTRICT INFRASTRUCTURE)
OUTLET ID
LAKE MUSKOKA
6
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KEY PLAN
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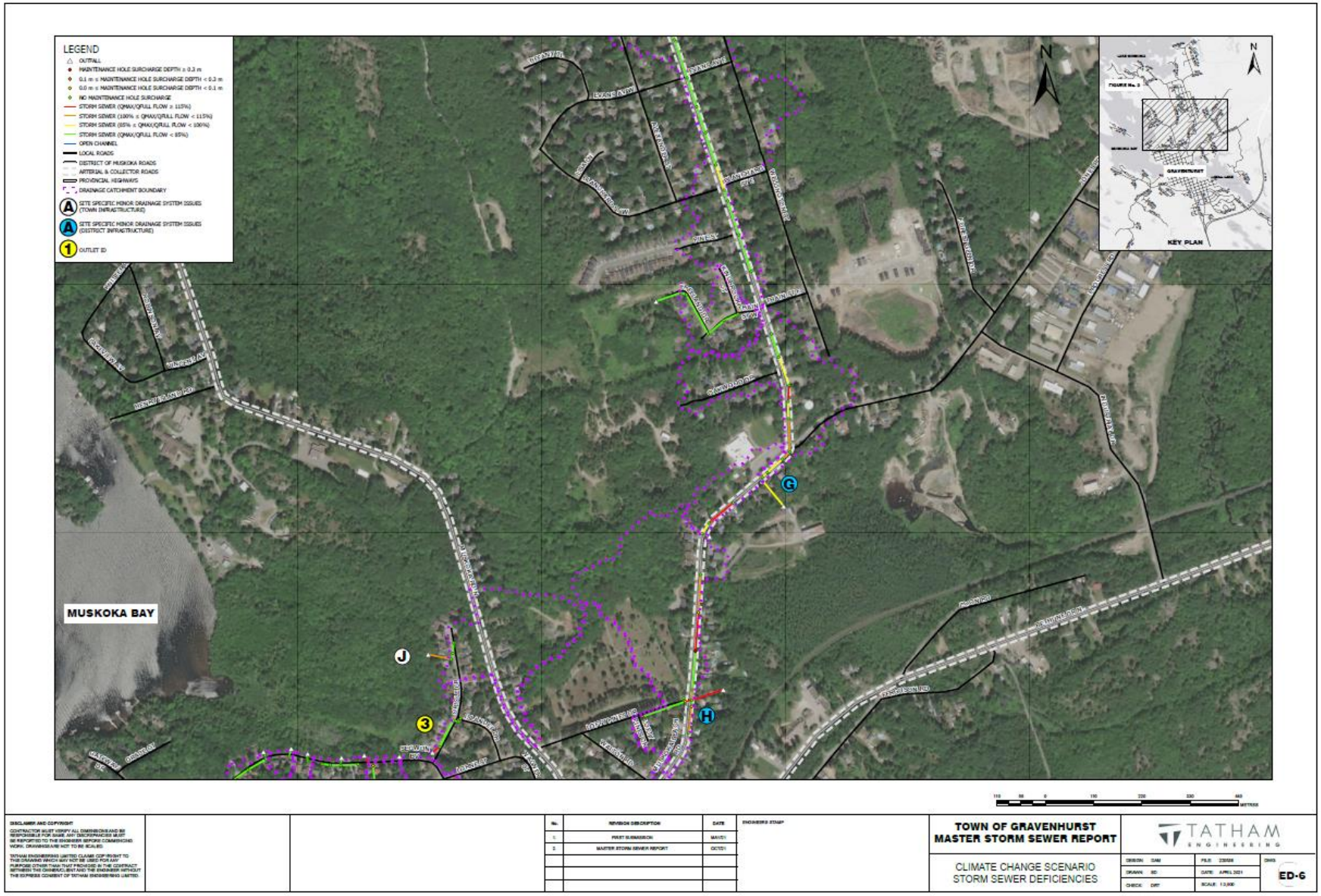
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OUTFALL
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NO MAINTENANCE HOLE SURCHARGE
STORM SEWER (QMAX/QFULL FLOW ≥ 115%)
STORM SEWER (100% ≤ QMAX/QFULL FLOW < 115%)
STORM SEWER (85% ≤ QMAX/QFULL FLOW < 100%)
STORM SEWER (QMAX/QFULL FLOW < 85%)
OPEN CHANNEL
LOCAL ROADS
DISTRICT OF MUSKOKA ROADS
ARTERIAL & COLLECTOR ROADS
PROVINCIAL HIGHWAYS
DRAINAGE CATCHMENT BOUNDARY
SITE SPECIFIC MINOR DRAINAGE SYSTEM ISSUES (TOWN INFRASTRUCTURE)
SITE SPECIFIC MINOR DRAINAGE SYSTEM ISSUES (DISTRICT INFRASTRUCTURE)
OUTLET ID
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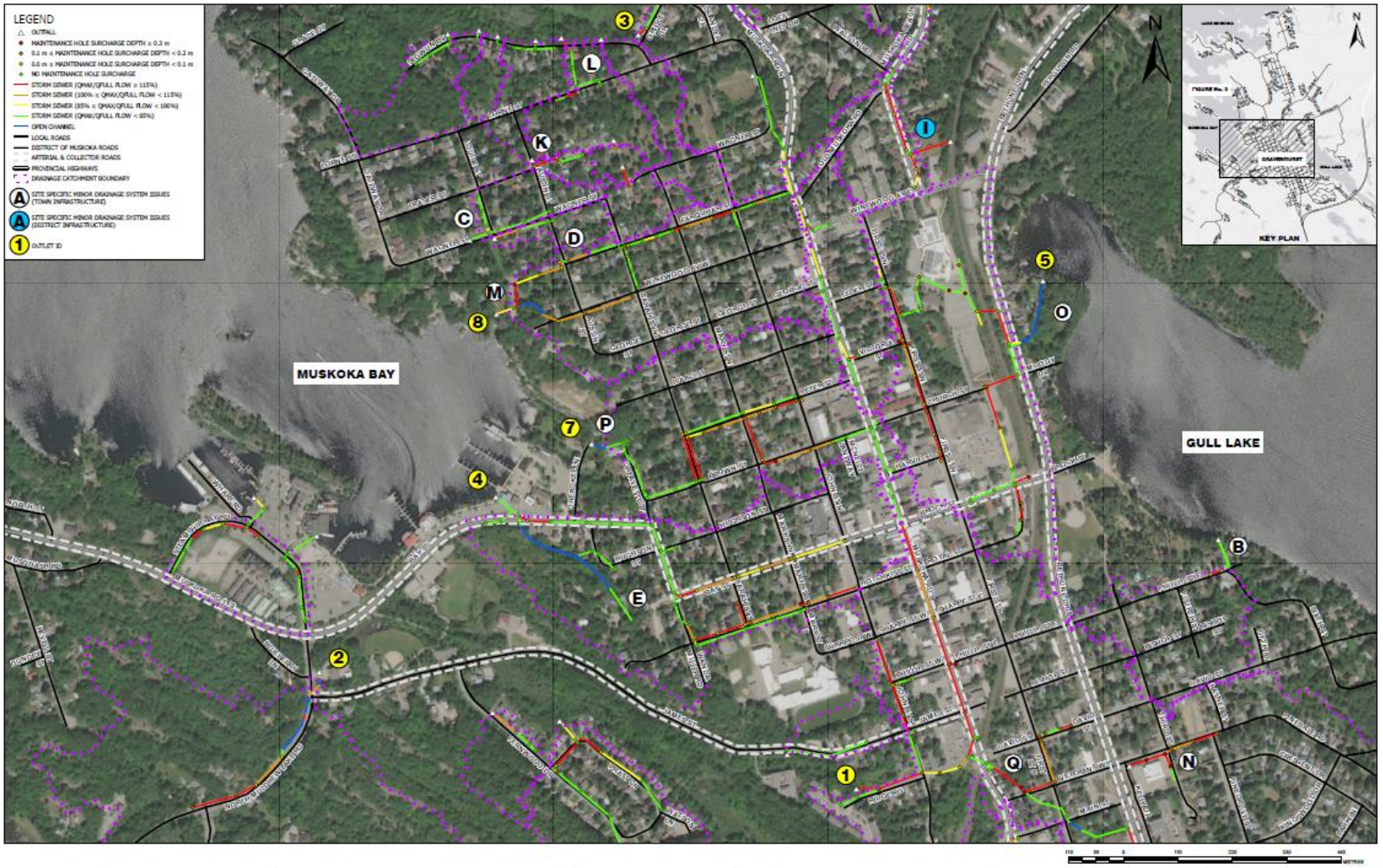

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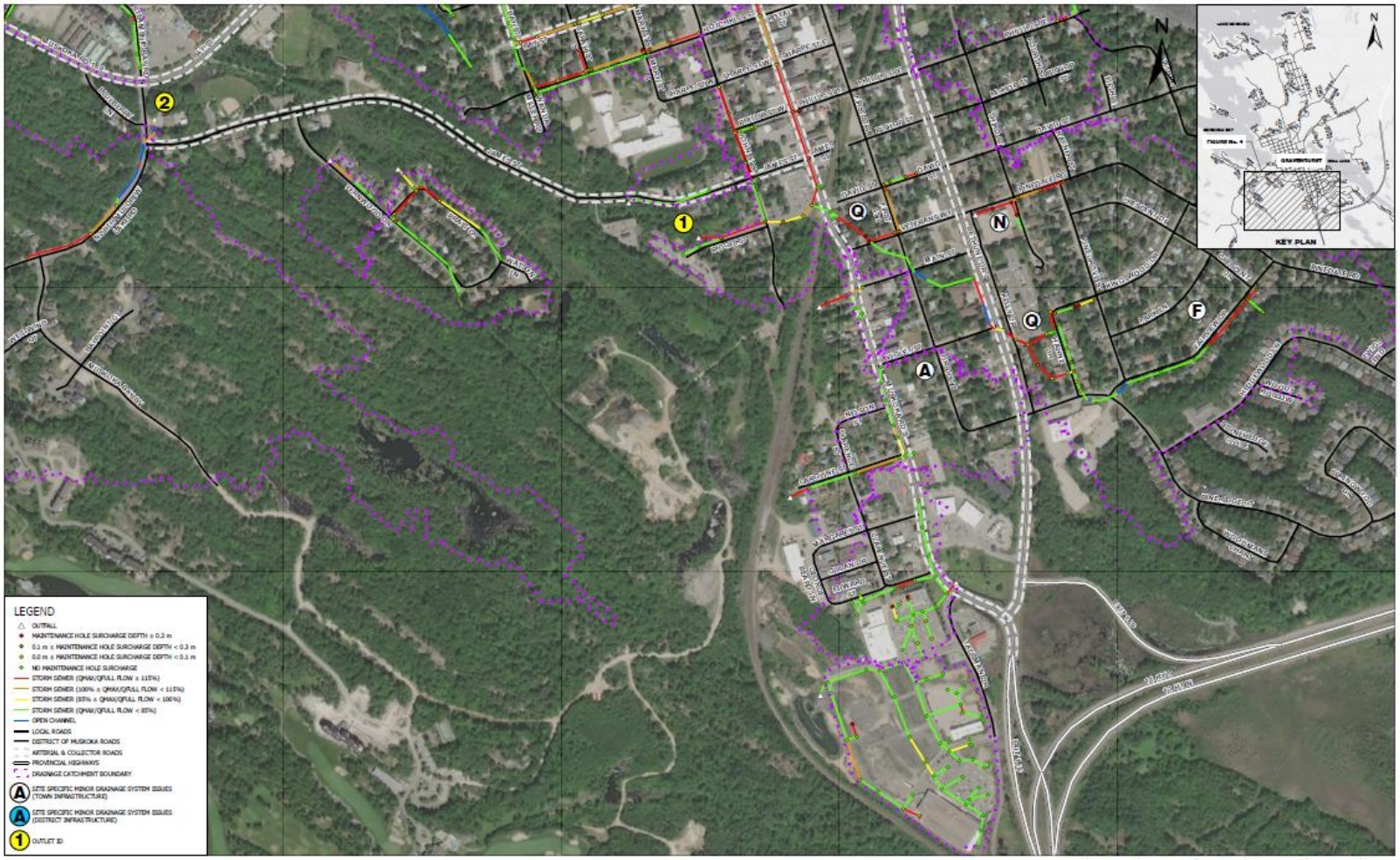

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