2022 ASSET MANAGEMENT PLAN

Core Infrastructure Version

Created by Muskoka Lakes Public Works Department

TOWNSHIP OF MUSKOKA Lakes

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EXECUTIVE SUMMARY

Executive Summary

E.1 Introduction

The Township of Muskoka Lakes is a vibrant community with a permanent population of 7500 people expanding to over 34,000 people during the summer months. The Township of Muskoka Lakes contributes to a high quality of life by providing a diverse array of services including culture and recreation, storm water drainage, roads and sidewalks, winter maintenance, and emergency services. If all of the assets that support these services were to be replaced today it would cost in excess of $500 million dollars, or about $67,000 per Muskoka Lakes resident. The Township of Muskoka Lakes' 2020 Core Asset Management Plan is the first asset management plan developed and published by the Township in over ten years. The plan outlines the processes and practices in place to get the maximum value from the Township's assets and services.

E.2 State of the Assets

The state of the assets report card provides a quantitative assessment of the core asset portfolio in terms of overall replacement value and estimated remaining life. **Table E-1** provides an overview of the replacement value and ratings of Township-owned core assets. Overall, the Township's asset portfolio has approximately 59 per cent remaining service life, which equates to being in the fair rating category. On this basis approximately $160.8 million are beyond their typical service lives. Of the portfolio, approximately 9 per cent, or $34.1 M in assets, have below 40 per cent remaining service life.

Table E-1. Asset System Ratings Based on Service Life and Condition

Asset System	Asset Category	2020 Replacement Value	% Remaining Service Life	Rating category	% of Assets Below 40% Remaining Service Life	2020 Replacement Value
Transportation	Bridges and Culverts	$22,814,000	25%	Poor	23%	$5,206,000
	Roads	$329,204,500	64%	Good	8%	$25,806,300
	Railway Crossings	$90,000	64%	Good	0%	$0
	Sidewalks	$285,155	52%	Fair	1%	$1,300
	Signs	$357,600	57%	Fair	19%	$67,000
	Street Lighting	$1,321,775	87%	Very Good	0%	$0
Storm Water		$44,106,500	44%	Fair	7%	$2,985,900
Total		**$398,179,530**	**59%**	Fair	**9%**	**$34,066,500**

It should be noted, that the estimates of remaining lives and rating categories do not necessarily mean that the assets are not providing adequate service. In order to improve the confidence in the numbers, the Township must continue to conduct investigations, and complete condition and performance assessments to best understand potential impacts to risks, levels of service and lifecycle costs.

E.3 Desired Levels of Service

One of the key goals of asset management is to understand the balance between the cost, performance and risks. Well-defined levels of service can be used to:

- Inform customers of the current level of service provided and any proposed changes to level of service and associated costs;
- Measure performance against these defined levels of service;
- Identify the costs and benefits of services; and
- Enable customers to consider the level of service provided within the context of affordability.

The core asset management plan presented is premised on the provision of the existing level of service in accordance with the requirements of Ontario Regulation 588/17 as amended. The vision is for the Township to establish key level of service requirements, and better understand the relationship between the levels of service and costs to provide the service. Tools and techniques will be developed to predictively model levels of service over time. Key initiatives that are to be considered or should be considered in future versions of the plan include:

- Development of a corporate asset management plan;
- Completion of a service review; and
- The development of a performance and accountability framework.

Findings of the Levels of Service initiative can be found in Section 3.

E.4 Lifecycle Management Strategy

Many Township departments and community stakeholders are involved in various aspects of each asset's lifecycle. Often those responsible for delivering the service will identify the need for new assets. After a need has been identified, the asset will be acquired or constructed. The asset then is operated and maintained on an ongoing basis, until heavier renewal would be required. As the asset nears the end of its life, a plan should be established to replace, decommission or upgrade the asset to meet the future needs. These activities collectively represent the asset's lifecycle. In asset management, the focus is on using a full lifecycle approach when planning. An asset lifecycle management strategy is the set of planned actions throughout the asset's full lifecycle that will enable the assets to provide desired levels of service in a sustainable way, while managing risk, at the lowest lifecycle cost. For the purposes of this plan, lifecycle activities are categorized as follows:

- **Non-infrastructure solutions**: Actions or policies that can lower costs or extend asset life (e.g., better integrated infrastructure planning and land use planning, demand management, insurance, process optimization, managed failures).
- **Maintenance activities**: Including regularly scheduled inspection and maintenance, or more significant repair and activities associated with unexpected events.

- **Renewal/rehabilitation activities**: Significant repairs designed to extend the life of the asset.
- **Replacement activities**: Activities that are expected to occur once an asset has reached the end of its useful life and renewal/ rehabilitation is no longer an option.
- **Disposal activities** – the activities associated with disposing of an asset once it has reached the end of its useful life, or is otherwise no longer needed by the municipality.
- **Expansion activities** – planned activities required to extend services to previouslyun-serviced areas – or to expand services to meet growth demands.

E.5 Financing Strategy

Long-term asset investment forecasts provide insight into prospective investment requirements which may fall outside of the 10-year planning horizon typically used in capital budgeting. Large quantities of asset construction during a short time span, as was the case in the post war years as an example , will require equally as heavy investment once those assets reach the end of their service lives. If those investment requirements are not addressed appropriately, levels of service could potentially decline and operations and maintenance costs could increase. The 25 year forecast presented only covers a portion of the lifecycle of the assets. Future versions of the plan should expand the time horizon of the forecast in order to cover the complete life cycles of the assets and allow for the identification of trends in funding needs.

Funding and investment requirements were developed for each asset system to establish an average annual lifecycle cost. **Figure E-1** provides the overall lifecycle investment requirements over the 25 year time horizon.

As can be seen from the figure, the current backlog of needs is approximately $24.2 M and average annual capital cost of $6.65 M is forecasted to be required over the 25-year period in order to keep pace with the rate of deterioration.

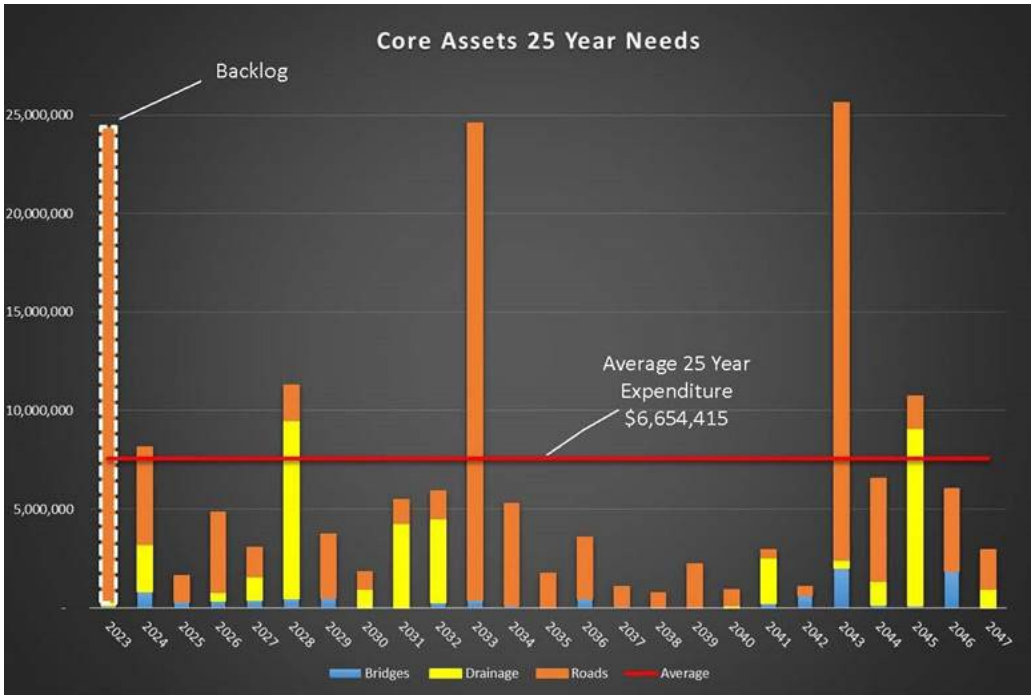


Figure E-1. 25 Year Lifecycle Investment Requirements

Figure E-2 provides the cumulative 25 year forecast expenditures for core asset systems ($166.4 M) and the corresponding cumulative revenues ($93.8 M) based on current levels of expenditure. Under this scenario the backlog of needs the backlog of needs can be expected to grow to $71.7 M in current year dollars.

It should be noted that the analysis considers only capital funding, and does not consider the current reserve position. Therefore, the percentage annual increase does not specifically correlate to a direct increase to rates or the tax levy, and could potentially be funded from a variety of sources, including but not limited to existing reserves or grants and subsidies.

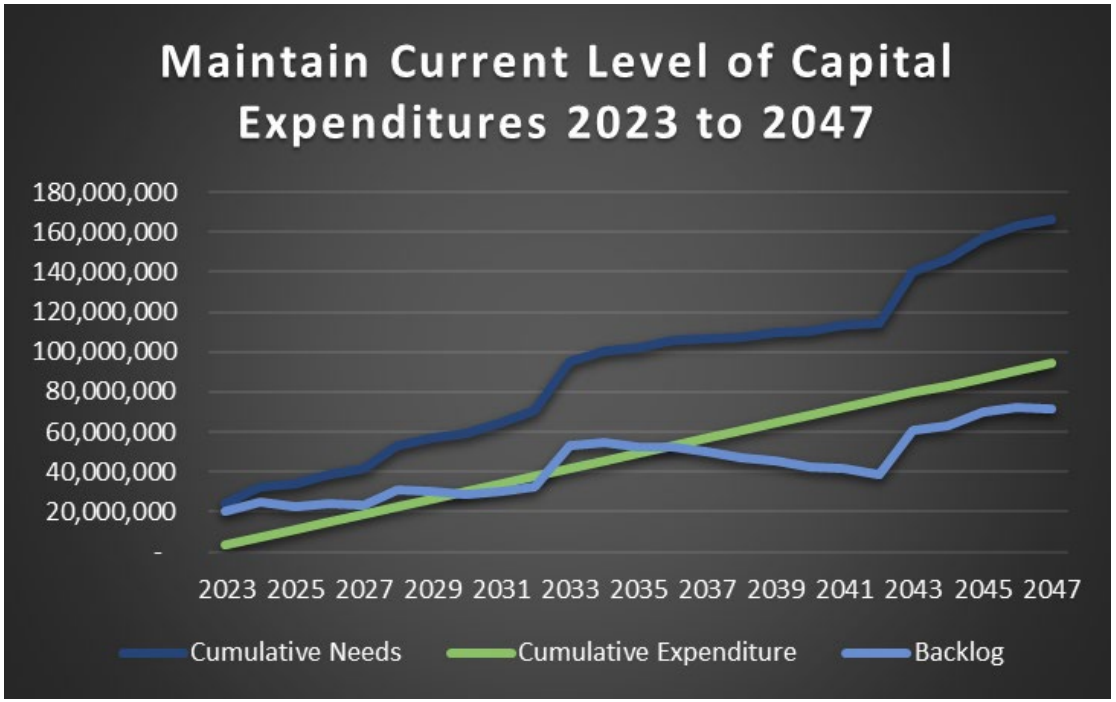


Figure E-2. 25 Year Cumulative Capital Investments vs. Revenues

E.6 Improvement Monitoring

One of the goals of this asset management plan was to establish a baseline of the current asset management practices, to inform a work plan for continuous improvement of the Corporate Asset Management Program. Any assumptions made and opportunities identified have been documented to serve as the basis for continuous improvement. This plan presented a proposed continuous improvement program in terms of two components: (1) actions related to improving future asset management plans; and (2) actions to advance the Township's overall asset management capabilities. **Figure E-3** provides the current and target maturity of our Corporate Asset Management Program in each key aspect of the asset management system. The work plan developed from this baseline aims to progress towards the targets over the next four years.

Figure E-3. Current and Target Asset Management Maturity based on the IIMM and ISO55000

The proposed work plan builds on the Township's existing strengths and is aimed at developing a leading Corporate Asset Management Program that will achieve organizational objectives while balancing costs, opportunities and risks against the desired levels of service.

Asset management provides a mechanism for reliable, repeatable and transparent decision making. However, asset management is more than just a one-off project and to realize the full benefits, the principles should be systematically developed, embedded and integrated across all departments, and be continuously improved. This should be the Township's aim.

SECTION 1: INTRODUCTION

1 Introduction

1.1 The Community

The Township of Muskoka Lakes is a vibrant municipality situated in the heart of Muskoka, approximately 220 km north of Toronto, Ontario Canada. It is the largest of the six municipalities that make up the District Municipality of Muskoka, having a land area of 781.55 sq. km. The Township has a permanent population of 7500 residents, expanding to approximately 34,000 in the summer months with the annual influx of seasonal residents. The Township of Muskoka Lakes includes the three largest lakes that are at the core of what makes up Muskoka: Lake Muskoka, Lake Rosseau and Lake Joseph. With miles of boating, natural wonders and a superb quality of life, Muskoka Lakes attracts visitors from around the world.

1.2 Asset Management Plan Context

The operation and maintenance of local roads, parks, buildings, like community centres and arenas, has been a core responsibility of municipalities for decades. The Federal and Provincial governments have increasingly become involved in the municipal infrastructure debate and more formal requirements for asset management planning at the municipal level have been evolving since the early 2000's.

1.2.1 Legislative and Regulatory Background

In 2002, Ontario's current Minimum Maintenance Standards were introduced, which provide municipalities with security against liability from actions arising with regard to levels of care on roads and bridges. In 2007, the Federation of Canadian Municipalities (FCM)

estimated that deferred investment in municipal infrastructure assets was $123 billion and growing across Canada. In 2008, underinvestment in municipal infrastructure prompted the Public Sector Accounting Board (PSAB) to update the Canadian accounting standard for municipalities to formally track capital assets in their annual audited financial statements. Then in 2011, the Ontario government released Building Together: Guide for Municipal Asset Management Plans, a framework for creating formal plans for all assets, not just water assets. This was followed up in 2012, as a component of the Municipal Infrastructure Investment Initiative, with a requirement that any municipality seeking grant funding was required to have an asset management plan in place. At that time, the Ministry of Infrastructure Ontario released the Building Together: Guide for Municipal Asset Management Plans (the Building Together Guide), which outlines the key components and requirements of asset management plans.

More recently in 2017 the province promulgated Ontario Regulation 588/17, Asset Management Planning for Municipal Infrastructure. Under the regulation municipalities are required to adopt a staged development of an asset management plan to address all of their infrastructure. The first requirement of the regulation requires that all municipalities adopt a strategic asset management policy by July 1, 2019. Secondly, the regulation requires the Township to prepare an asset management plan for its core infrastructure by July 1, 2021. Due to the COVID pandemic this was extended to July 1, 2022. For the purposes of the Township, core assets are the roads, bridges and stormwater management systems under its control. The plan is required to be amended/expanded to include all of infrastructure under its control by July 1, 2023. Finally, the Township must further amend its asset management plan by July 1, 2024 to include the levels of service to be delivered by the Township for each asset category covered by the plan. A financial plan is also required and must demonstrate how the levels of service are to be funded. These additional considerations must be completed as part of the amendment process to the Corporate Asset Management Plan.

1.2.2 Township of Muskoka Lakes

In 2014, the Township of Muskoka Lakes signed a Federal Gas Tax funding agreement with the Federal Government, which ensures approximately $200,000 of funding each year towards infrastructure related work. One of the conditions of future funding from the Federal Gas Tax, now referred to as the “Canada Community-Building” Fund, is that the Township should have an asset management plan in place by December 31, 2016, which meets the requirements of the provincial guidance document, Building Together Guide. The Province also announced that future infrastructure funding opportunities will be conditional on municipalities ensuring that their asset management plans meet the requirements outlined in the Building Together Guide.

To meet that requirement, the Township created “A Core Service Infrastructure Asset Management Plan” in 2014. This plan covered the core assets under the jurisdiction and control of the Township as defined by the Province of Ontario at that time (roads and bridges). While the plan was basic in nature and narrow in terms of time frame, it addressed the essential issues sufficiently to meet the requirements of the day and make the Township eligible for funding under the various programs.

Given the broad nature of the Building Together Guide, The Province found that there was no consistency in the asset management plans developed by municipalities. The plans developed ranged from very elaborate and comprehensive to very cursory. In the response, the Province enacted the very prescriptive Ontario Regulation 588/17: Asset Management Planning for Municipal Infrastructure. The

regulation requires that municipalities to adopt an asset management policy by 2019 and to work towards putting in place a comprehensive plan manage and sustain all assets by 2024 with interim milestones allowing for progressive formulation and adoption of plan by the Township. A complete description of the requirements of the regulation are provided in Appendix I.

The Township adopted its asset management policy (C-FS-13) in May, 2019. The next goal is to develop a plan that addresses core assets by the July, 2022 deadline. This plan has been developed to address this requirement. Following Policy C-FS-13, this plan builds on the initial work completed by the Township in 2014 and includes:

- an increased level of detail on the extent and state of the core assets according to the updated definition set by the Province;
- the full lifecycle of the assets for the term of the plan:
- more in depth analysis of asset condition now and over the term of the plan;
- consideration of levels of service currently provided;
- A high level strategy of how the current levels of service will be financed.

The intention is to provide Council with the best available information so that it can start to make informed choices/decisions.

1.3 Goals of the Municipality and Dependence on Assets

An integral component of ensuring reliable service is creating an effective approach to managing existing and future municipal assets. Effective asset management aims to realize value from assets in a way that balances levels of service, risk, and cost effectiveness throughout the entire asset lifecycle. Ultimately, adopting effective and comprehensive asset management strategies across the organization will support long term sustainability and efficiency while maintaining acceptable levels of service.

1.3.1 Asset Management Policy

As stated above, an early objective was the adoption of Policy C-FS-13, which reflects current best practices for asset management planning. This Policy is included in Appendix II, and outlines the principles and general framework to ensure a consistent and coordinated approach to achieve the Township's asset management objectives. The Township will meet these objectives by:

- Balancing life cycle costs and acceptable risks with desired levels of service;
- Linking asset investment decisions to service outcomes;
- Ensuring accountability, transparency and engagement; and
- Demonstrating sustainable, full lifecycle planning.

The key sections of the Policy are as follows:

1. **Policy Statement:** A brief description of what the Policy includes.

2. **Scope of the Asset Management System:** A definition of the components, scope, and documents within the asset management system.

3. **Terms and Definitions:** Key definitions for use within the Asset Management Policy, and a commitment that all terminology in official asset management documents shall be consistent with ISO 55000:2014(E) – International Standard for Asset Management.

4. **Roles and Responsibilities:** The roles and responsibilities of Council, the Executive Team, the Corporate Asset Management Steering Committee, Corporate Asset Management division, and the asset system working groups and service providers.

5. **Procedure:** Key goals and guiding principles of the Corporate Asset Management Program. The asset management mission statement, and the key asset management goals.

1.3.2 Strategic Direction

Late in 2020, Council approved a Strategic Plan which set the direction for the balance of the current term of Council, as well as the first two years of the 2022-2026 term of Council. Prominent among the overarching goals for the Township is the need to enhance and sustain the public services and infrastructure delivered by the Township. Key amongst the initiatives identified to the accomplishment of this goal included:

- Maintain a focus on organizational excellence, accountability, and responsibility, strengthen staff engagement, and support staff with training necessary to effectively deliver services to residents.
- Assess the Township's current service delivery models and identify opportunities for modernization, digitization, and enhanced customer service engagement.
- Develop and implement a series of master plans that identifies opportunities to maintain and enhance the Township's infrastructure.

These objectives place a focus on criticality and the long-term benefits that will accrue to the community by making the best use of the Township's assets. To achieve these goals, the Township's efforts have to focus on three core outcomes:

- Service excellence: delivering quality service and showing results.
- Financial stability: managing our resources to achieve maximum public value.

- Innovation: modernizing how the Township works.

The Township must focus its attention on three initiatives that will help to accomplish our goals. These are:

- Service modernization: Delivering municipal services that make lives better. The Township will deliver easy access to the services our community needs and provide an exceptional service experience.
- Leadership and engagement: Building a great community together. Policies and practices that encourage an environment of openness and culture of collaboration to promote employee development, growth and satisfaction.
- Sustainable resources: Ensuring a solid foundation for a growing Township. A disciplined, long-term approach that ensures financial stability and maximum value from our municipal assets.

The foregoing strategic direction has guided the development of this plan and will be achieved by the plan's intended outcomes.

1.4 Purpose of the Asset Management Plan

This Asset Management Plan sets out how the Township's assets will be managed to achieve the desired levels of service, considering a full lifecycle approach, and ensuring long term financial sustainability. This document represents a jump forward in the Township's journey towards asset management proficiency and will be improved and updated as we move ahead and learn more, and as the field of asset management grows and develops. This Plan covers the Township's Corporate Asset Management Program at a high-level, identifying gaps and opportunities, and it outlines a work plan for continual improvement as the program matures.

The purpose of this Plan is to:

- meet and exceed the requirements of the Ontario Ministry of Infrastructure (2012) Building Together Guide for Municipal Asset Management Plans and the requirements of Ontario Regulation 588/17;
- establish a baseline of current asset management practices to inform a work plan for continually improving asset management;
- more accurately quantify the infrastructure deficit and investment gap;
- demonstrate long-term asset care and sustainability;
- create a single master asset hierarchy and inventory;
- support the development of improved practices that clarify and justify funding requirements; and
- provide increased transparency related to the Township's asset management practices, challenges and opportunities.

The Plan provides a baseline for the following initiatives for 2022 and beyond:

- corporate level of service framework;

- risk management and prioritization strategies;
- condition assessment strategies;
- data management strategies; and
- detailed asset system management plans

1.4.1 Catalysts for Change

While senior level of government funding eligibility requirements have increased the awareness around asset management and put a level of urgency on the development of associated plans, the benefits of asset management extend far beyond meeting regulatory requirements. Asset management focuses on making the best possible decisions regarding the building, operating, maintaining, renewing, replacing and disposing of assets. Effective asset management has been demonstrated to support strong governance and accountability, sustainable decision-making, enhanced customer service, effective risk management, and improved financial efficiency. By adopting a culture of asset management excellence, the Township is taking the necessary steps to ensure that budgets are allocated wisely, while ensuring service levels are detailed and maintained.

1.4.2 Defining Asset Management

The discipline of asset management is a combination of management, financial, economic, engineering, operational and other practices applied to assets with the objective of providing the required level of service in the most cost-effective manner. The key principles of asset management are:

- providing defined levels of service and monitoring performance;
- managing the impact of growth through demand management and asset investment;
- taking a full lifecycle approach to developing cost-effective management strategies for the long- term to meet the defined level of service;
- identifying, assessing and appropriately controlling risks; and
- having a long-term financial strategy which identifies expenditures and how they will be funded.

Fundamentally, effective asset management means making the best possible decisions regarding our assets. Asset Management seeks to answer seven key questions about a municipality's assets. Each of these seven questions is addressed in more detail below as are the key concepts of asset management that relate to the questions.

Question 1 "What assets do we own and what is their condition?"

Question 1 introduces two ideas, an asset inventory and asset condition. Before the 2008 update to the Canadian municipal accounting standard, there was no standardized way of providing an inventory of the assets owned, operated and maintained by municipalities.

The second idea is "asset condition" which is important for optimizing asset management activities so we only replace assets that have

a degraded condition or are at elevated risk of failure.

A common practice for many municipalities at the start of their asset management planning process is using the age of the asset as an approximation of the condition as most assets have been designed with an expected life and performance degrades with time. Conducting inspections and assessments of each asset is a more precise method of determining condition, but can be costly and time consuming to properly collect, manage and analyze the data that is collected.

Question 2 “What are they worth?”

Question 2 starts the financial discussion and introduces the concept of how to put a value on municipal assets. Some assets have a very long estimated life, in the 80 to 100 year range. The “cost” of an asset is not clear-cut; it can be the original cost, the current cost or the projected future cost. The approach selected will have a significant effect on the outcome of financial planning. Original costs can become outdated due to inflation, and guessing what the future replacement cost can have a large margin of error. The Township has built its asset management plan based on what it costs to replace an asset today, which is becoming the common practice for reporting municipal asset values.

Question 3 “How are they performing?”

This question looks at performance measures that describe the minimum acceptable condition of assets and the service provided. These together form levels of service, which can be regulatory requirements, Council approved targets, or defined by industry best practices.

Question 4 “What actions do we need to take?”

This question is intended to draw out what types of actions or management strategies are needed to keep assets in good working order, properly operate the assets and eventually repair or replace the assets. The answers to this question begin to define how much money is required to sustainably maintain the assets, and are influenced by the levels of service, with higher or more stringent levels of service generally requiring more maintenance and having higher operating costs.

Question 5 “When do we need to do it?”

This requires an understanding of the estimated life of assets and lowest total costs concepts. Achieving the lowest total costs often includes more investment early in the asset’s lifetime to address problems early and avoid premature failure, and rehabilitation that extends the life of the asset beyond the original estimates. These types of interventions, when planned well, result in a lower overall cost.

Question 6 “How much will it cost?”

Question 6 looks at total lifecycle costs which include the operational, maintenance and end of life capital costs. In a municipal context, the operational and maintenance costs will typically be funded through the annual Operating Budget, and the end of life costs identified and funded through the Capital Budget and Forecast. Common practice is to have a 10 year capital forecast based on the current condition of assets, prioritizing funding for specific projects. However, given the projected lifespan of long-lived assets, a more sustainable approach is to adopt a longer term capital strategy based on end of life replacement of assets that spans 20+ years. The longer term view creates a forecast for how much funding will be required annually to replace end of life assets, and provides information about when peaks in funding needs may occur.

Question 7 “How will we fund it?”

Finally question 7 addresses where the money will come from and how different financial strategies can be used to manage the total costs over the long-term. It requires an examination of forecasted expenditures, and funding and revenue sources through the Operating Budget, Capital Budget and Reserve Funds.

Together these questions provide a road map for the development of a comprehensive municipal Asset Management Plan.

1.5 Assets Included in the Plan

This version of the plan addresses the needs of only the core asset classes under the control of the Township including:

- bridges and culverts;
- roads; and
- roads auxiliary items (Signs, Sidewalks, Streetlights).
- stormwater management (drainage) facilities;

Future versions of the plan, will address the balance of the assets under Township control including:

- administrative facilities;
- culture, recreation and sports facilities;
- information technology, including digital and non-digital records;
- ecological/environmental assets on municipal properties;
- emergency services infrastructure;
- libraries;
- parking; and
- vehicles and equipment.

1.6 Duration and Updates to the Plan

A long term asset renewal outlook is necessary to capture the full lifecycle of the assets when identifying the timing of asset replacement and rehabilitation requirements and associated costs. Many of the assets have life expectancies that span decades, therefore a 100 year timeframe ensures that the complete lifespan of each asset is captured. In cases where there is an extremely short lifespan (such as vehicles and information technology devices), a 40-year analysis period may be used.

The update of our asset management related data should be incorporated into our normal business processes so that the Township’s ongoing operations can be based on the best available information. The asset management plan should be fully re-evaluation and updated at least every five years or following a major update of the Township’s Strategic Plan.

1.7 Developing a Corporate Asset Management Plan

A structured approach was followed to develop this plan. This process will be further refined in future versions. An outline of key tasks,

the stakeholders involved, and limitations of the work plan are provided in the following sections.

1.7.1 Key Tasks

This Asset Management Plan was developed by the Public Works Department in conjunction the other departments within the Township and builds on the initial asset management work that began in 2014. The key tasks involved in developing this plan included:

1. **State of the Assets**
   - background data collection;
   - developed initial condition estimates;
   - developed replacement costs; and
   - created the asset management plan template and analyzed and summarized data.
2. **Levels of Service**
   - identified current levels of service by group; and
   - identified current regulations by group.
3. **Asset Management Strategy**
   - documented current decision making strategies and business processes;
   - document operation and maintenance (O&M), rehabilitation, and replacement strategies; and
   - documented capital planning processes.
4. **Financial Management Strategy**
   - initiated consideration of sustainable funding levels; and
   - initiated consideration of financing and funding strategies.
5. **Draft Asset Management Plan**
   - draft Asset management Plan chapters;
   - submit to Strategic Leadership Team then Committee/Council for review;
   - address comments.
6. **Final Asset Management Plan**
   - incorporate revisions to chapters of the draft Asset Management Plan;
   - present consolidated final Plan to Committee for review and comment;
   - council adoption of the final Asset Management Plan; and
   - creation of Asset Management page on the Township website.

1.7.2 Who Was Involved

Table 3 summarizes the roles and responsibilities of the key stakeholders who were involved in the development of the Plan.

Table 3. Corporate Asset Management Plan Stakeholders

Stakeholder Team	Roles and Responsibilities
Director of Public Works, **Director of Finance**	▪ coordinate and manage the work plan; ▪ collate asset and historical data; ▪ compile and reconcile asset inventory; ▪ develop tools and conduct analysis; ▪ research levels of service and current asset management strategies; ▪ develop chapters of draft and final plan; ▪ address comments; and ▪ consolidate comments and present and publish the final plan.
SLT	▪ support the development of the asset management plan through ensuring staff availability where required; ▪ review and provide comment on the various chapters of the draft asset management plan; and ▪ review and comment on the final asset management plan.
Departmental Staff	▪ supply and collate service area specific inventory data, levels of service, documents and other pertinent information; ▪ attend update meetings; and ▪ review and comment on the draft asset management plan.
General and Finance Committee	▪ review and comment on the various chapters of the draft asset management plan and endorse the final asset management plan for Council's consideration.
Township Council	▪ Consideration of approval of the final asset management plan.

1.7.3 Limitations

The Corporate Asset Management Plan was developed based on the best available information and making assumptions using professional judgement to address gaps. Limitations of this Plan include assumptions made regarding:

- installation dates, where they were unavailable;
- allocation of total replacement costs of facilities to the various sub-components (such as structural, electrical, and mechanical) due to the differing life expectancies of each component; and
- use of age-based condition assessment in the absence of actual condition information, and estimates of costs based on professional judgment where cost information was unavailable.

In addition to the previous assumptions, the following limitations were encountered as the Plan was developed:

- different service areas within the Township have different approaches to asset management, limiting capabilities for comparisons and prioritization;
- there is no centralized asset management system that offers a complete inventory or summary of project information. The Township relies on a variety of manual and digital means to collect most of its asset information. There is limited integration between the systems at this time;
- there are gaps in inventory and condition information and considerable effort is required to consolidate information from multiple sources;
- the Township does not have a level of service register and has no system to track levels of service for most service areas. There is a need for the Township to complete a level of service framework to guide future asset management planning. This will be discussed further on in this plan;
- the Township does have an approved enterprise risk management framework. A corporate asset risk management framework needs to be developed as part of the developing Corporate Asset Management Program;
- the Township does not address condition information in a consistent way. Condition can be technically assessed and reported on in a quantifiable way. A technically based approach is the most accurate but the most expensive (e.g. Pavement Condition Index). Condition can also be based on age and estimated service life. Finally, condition may be based on the expert opinion of staff using the asset. By contrast, many asset types do not have objective condition assessment information. Given the type and level of data available for condition, risk and level of service indicators there is limited ability to accurately determine trends at a detailed level;
- currently, projects are compared and prioritized based on cost and perception of need. This results in decisions being made without the benefit of the considerations available through an optimized decision-making process that allows triple bottom line considerations, risk and level of service to enter the discussions; and
- This Township does not have other planning studies and assessments in place for the majority of the assets that would have provided a base for authoring this plan. However, following from the Township's Strategic Plan, a number of these supporting plans are being developed and can be implemented over the next few years.

The development and implementation of a corporation-wide asset management plan will support the opportunity to generate data that will improve confidence in the condition rating of assets, and the through the work plan, the Township will develop the ability to optimize decision making using level of service and risk factors. Where any of the above assumptions have been utilized, a corresponding action item has been developed to close any gaps in the future. All of these limitations will be resolved over time as the Corporate Asset Management Program evolves.

1.8 Evaluation and Improvement

This document is the Township's first comprehensive asset management plan and provides a high-level overview of the corporate asset management program. This document should be viewed as the beginning of the Township's journey in sophistication with asset management planning. This plan will be updated as the Township completes the prioritized list of work plan items identified in Section 6. In addition, this plan and associated documents will be routinely reviewed to update to the most accurate data as background processes and information are continually improved.

The Township's approach to corporate asset management needs to be founded on the principles of continuous improvement, transparency, and accountability. This plan is just one part of the overall quality management system for asset management that needs to be established based on best practices. Staff will complete regular audits of asset management practices with comparison against industry best practices.

SECTION 2: STATE OF THE ASSETS

2 State of the Assets

This section outlines a quantitative assessment of the Township's assets in terms of overall value and estimated remaining life. In other words, it provides a report card on the state of the Township's core assets.

The primary objective of this report card is to provide high-level insights into the overall age and condition of the Township's assets based on typical lifecycles. Where actual condition assessment data exists, it has been used to ensure the most accurate insights possible. When reviewing the results that are presented, it is important to bear in mind the notion of confidence in the data. In some cases, where condition, age or cost data does not exist, industry standards coupled with Staff's experience and professional judgment have been used to provide the fullest picture possible. To assist with future data improvement efforts, an average data confidence rating has been provided alongside each of the results. As an outcome of this plan, the Township will develop a strategy to improve the data and address gaps. Readers will see adjusted results and confidence ratings in future updates as the background data improves.

Although based on several assumptions such as asset ages and deterioration, an asset report card is a valuable tool in establishing an understanding of the current state of assets, trends, potential levels of service and upcoming issues or opportunities. This methodology is widely used in the industry, and in particular is used by the Federation of Canadian Municipalities in the development of the Canadian Infrastructure Report Card[1]. While the Township currently has significant data regarding the structural condition of a large majority of its asset classes, a number of data gaps exist around physical performance.

The asset report card presented in this section of the plan:

- translates the consolidated, estimated age or condition of the assets within each of the asset systems into a five-level rating system ranging from Very Poor to Very Good;
- aggregates the ratings for each of the asset systems into the overall portfolio rating using a weighted average;

- uses a methodology that is repeatable and consistent with the Canadian Infrastructure Report Card to enable comparative analysis and benchmarking over time;
- provides transparency in terms of the confidence of the input data, to provide context to the reader; and
- improves over time as the overall confidence of the background data improves.

[1] *The Canadian Infrastructure Report Card Website [Online http://canadianinfrastructure.ca/en/index.html].*

2.1 Asset Types

An inventory for the Township's assets was developed using the Township's detailed asset data for each of the asset systems. Each program area was divided into the asset categories as shown in **Table 1**. Though not shown in the table, the asset categories were further broken down to the individual asset level for the analysis (for example, a section of road on a particular street or individual vehicles).

Table 1. Asset Inventory Classification

Asset System	Asset Category	Asset	Count	Size/ Area	Unit
Transportation	Bridges and Culverts	Bridge	13	1582	Sq m
		Culverts (>3.0m)	8	1013	Sq m
	Roads^	Hard Top	324	229.12	Km
		Loose Top	156	126.85	Km
	Railway Crossings	Protected	3	-	Ea
		Unprotected	2	-	Ea
	Sidewalks	Concrete	-	2002	M
		Pavers	-	1201	M
	Signs	Informational	416	72.8	Sq m
		Regulatory	923	269.4	Sq m
		Warning	449	152.5	Sq m
	Streetlighting	LED	443	-	Ea
		INC	3	-	Ea
		Poles	171	-	Ea
	Stormwater	Rural	-	649.59	km
		Urban	-	2422	m

^ *Roads includes seasonally maintained roads but excludes non-maintained roads on public ROW's*

2.2 Financial Accounting Valuation and Replacement Cost Valuation

In the asset management industry, there are two generally accepted methods of reporting the value of asset portfolios, the accounting valuation method, and the replacement cost valuation method. Some key differences between the two methods are:

- **Accounting Valuation:** Includes the full historical cost to acquire and commission the asset, which is depreciated over the expected life of the asset. The 'Net Book Value' follows financial accounting principles defined by the Public Sector Accounting Board (PSAB);
- **Replacement Cost Valuation:** Based on current industry pricing and inflation to the year of replacement and/or rehabilitation.

The two approaches and their implications for the Township are discussed below.

2.2.1 Accounting Valuation

The "accounting valuation" is based on the PSAB 3150 reporting requirements at December 31, 2020 and is taken from the Township's FIR submission to the Ministry of Municipal Affairs and Housing. The "accounting valuation" assumes straight line depreciation of the value of the assets over their useful life.

The valuation of assets by asset type is shown in **Table 2,** and indicates the following:

- The accumulated amortization is approximately $45,969,530 which means that the total asset base is approximately 55 per cent through its life expectancy; and
- The Net Book Value of the asset portfolio is approximately $28,462,994.

Table 2. Muskoka Lakes 2020 FIR Values

Asset System/Category	2020 Closing Cost Balance	2020 Closing Amortization Balance	2020 Closing Net Book Value	Life Remaining (%)
Transportation Services				
Roads	65,105,425	42,418,767	22,686,658	35%
Bridges and Culverts	9,327,099	3,550,763	5,776,336	62%
Total Tangible Capital Assets	74,432,524	45,969,530	28,462,994	38%

Financial "accounting valuation" is completed on an annual basis by the Township of Muskoka Lakes to meet financial reporting requirements of the Ministry of Municipal Affairs and Housing. However, it is not used for asset management purposes. In the PSAB reporting, a straight line depreciation method is used to estimate the amortization. Based on this approach, many assets that are beyond their economic lives have been fully depreciated.

From an asset management perspective however, although many have “no value” they continue to provide adequate levels of service. Therefore, while the net book value is a valuable approach for financial reporting, it is not necessarily indicative of the condition and performance of the asset. In addition, the value is based upon the historical cost, and not the current cost to replace the asset. Using the historical cost understates the costs when planning future replacements. For this reason it is preferable to evaluate the portfolio using “replacement cost valuation”. The replacement values provide a more accurate estimate of the future cost required to replace the asset at the end of their life.

2.2.2 Replacement Cost Valuation

The “replacement cost valuation” is developed using a combination of current industry practices for the assets and indexing historical costs to current year to reflect the value in 2020 dollars. Several methods were used to estimate the replacement costs of the assets, including:

- **tender pricing and recent unit costs:** which is based upon recent closed tender pricing, which provides an accurate perspective of the anticipated cost to replace a similar asset;
- **condition assessment replacement costs:** which is based upon third-party cost estimates;
- **property insurance values:** in the absence of tender pricing and recent unit costs, recent insurance replacement cost valuations were used.
- **market unit cost indices:** if none of the above information was available, industry cost indices were used such as Altus Group Canadian Costing Guide (2019) and Hanscomb (2019) Yardsticks for Costing: Cost Data for the Canadian Construction Industry; and
- **inflated historic costs:** when none of the above information was available, the historic cost was inflated to present day dollars using the Non-Residential Building Construction Price Index. [2]

Table 3 provides the estimated replacement value of the Township’s asset inventory:

2. *Statistics Canada (2016) Table 327-0043 Price indexes of non-residential building construction, by class of structure, annual [Online: http://www5.statcan.gc.ca/cansim/a47].*

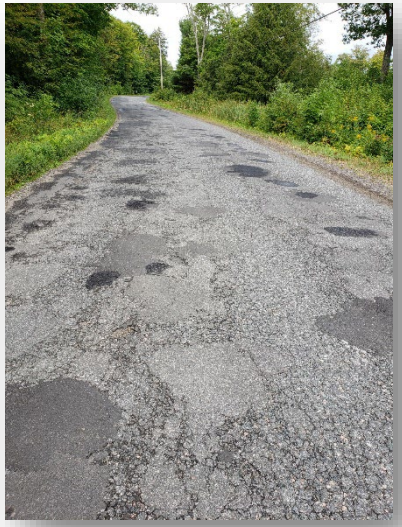
Table 3. Asset Replacement Costs

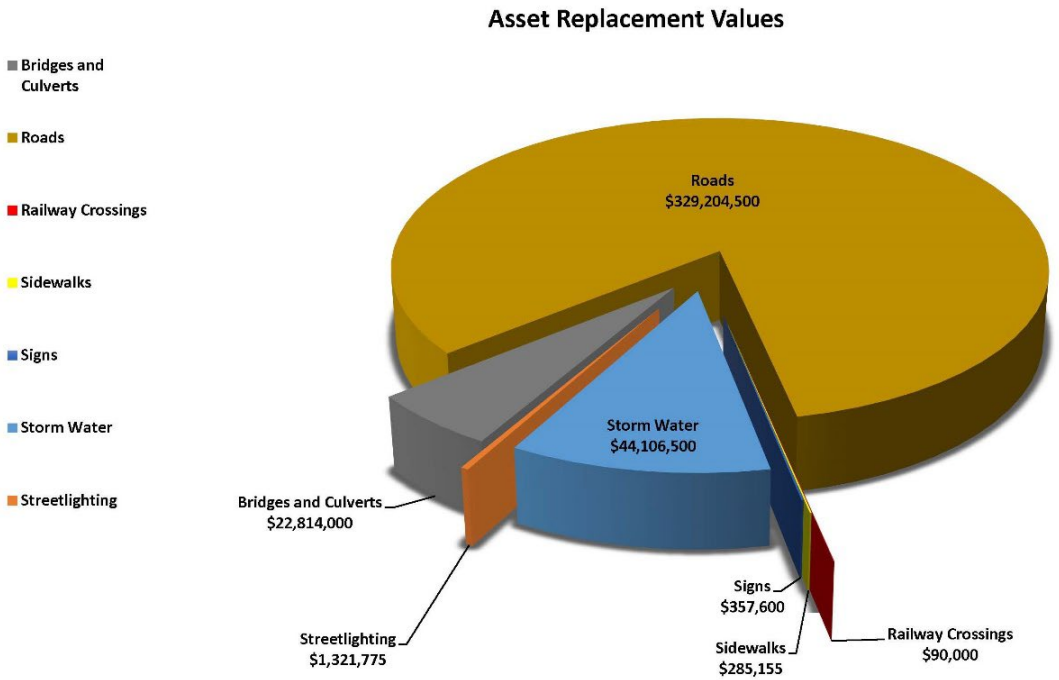
Asset System			Replacement Cost
Transportation	Bridges and Culverts	Bridge	$19,775,000
		Culverts (>3.0m)	$3,039,000
	Roads	Hard Top	$228,071,100
		Loose Top	$101,133,400
	Railway Crossings	Protected	$60,000
		Unprotected	$30,000
	Sidewalks	Concrete	$220,812
		Pavers	$64,343
	Signs	Informational	$83,200
		Regulatory	$184,600
		Warning	$89,800
	Streetlighting	LED	$368,250
		INC	$3,525
		Poles	$950,000
	Stormwater	Rural	$41,703,000
		Urban	$2,403,500
Total			**$398,179,530**

Figure 1 depicts the replacement value of the assets across the asset categories. The total replacement value of the Township's transportation portfolio is estimated to be approximately $398 million in 2020 dollars. This is the estimated cost that would be incurred if the Township were to replace all of its assets in their current configuration today. It is important to note that while the estimates identify the cost to replace the asset in like kind, it should not be considered the cost to build a new asset. Many of the Township's assets do not conform to current standards and any replacement would be required to be in compliance with current regulatory requirements, codes of practice and standards. As a consequence, actual construction costs may be significantly higher.

Figure 1

The Township's Transportation System represents the largest single investment with an estimated replacement value of just short of $400M. Within this Asset System, the roads category represents $329M or 83% of the value of the portfolio.





2.3 Asset Age Distribution

An asset's estimated service life is the period of time that it is expected to be of use and fully functional to the Township of Muskoka Lakes. For the purposes of this analysis, unless condition and performance data exist, once an asset has reached the end of its service life, it has been deemed to have deteriorated to a point that necessitates replacement. Individual estimated service life data was used in conjunction with original construction dates to determine the theoretical remaining service life of each asset.

Table 4. Useful Life of Assets

Asset	Asset Component	Useful Life
Stormwater	Catch Basins/Manholes	40-80
	Ditches	10-20
	Ponds	20-30
	Storm Sewers	80-100
Transportation	Bridges	80-100
	Culverts	20-40
	Railway Crossings	15-20
	Roads Surface	10-20
	Roads Base	20-40
	Sidewalks	20-40
	Signs	5-15
	Streetlights	15-20

Figure 2 summarizes the theoretical year of installation by replacement value for the asset portfolio by decade.

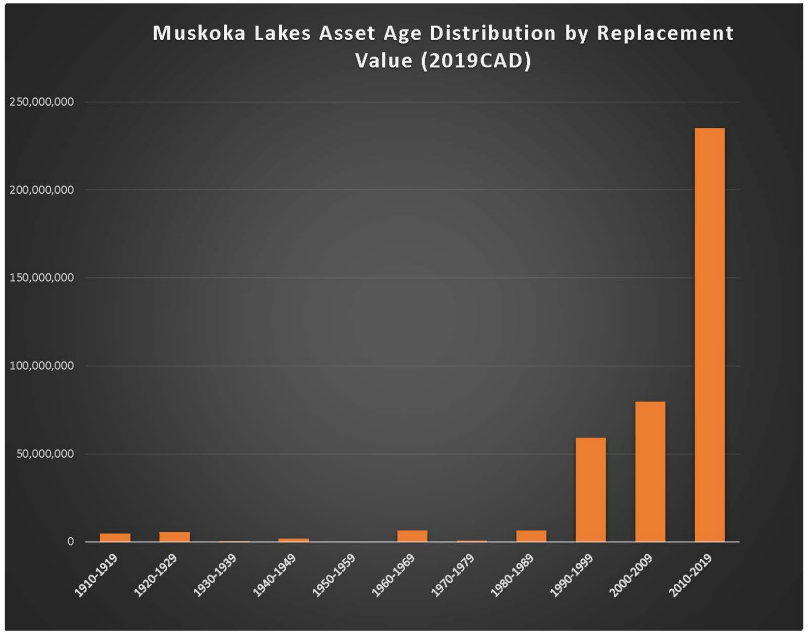


Figure 2. Muskoka Lakes Asset Age Distribution by Replacement Value (2019 CAD)

Given that the bulk of the Township's assets have a relatively short service life ranging from 10 to 40 years, it is to be expected that the bulk of the assets would have a theoretical age falling within the last 30 years.

Using the estimated service life remaining and physical condition data (where available), a weighted average remaining life score was calculated for each asset. The average remaining life score was categorized into five rating categories ranging from very good to very poor as shown in **Table 5** below. Individual asset scores were then aggregated up to the asset system, and then a weighted overall portfolio rating was obtained. The approach and rating scale is consistent with the Canadian Infrastructure Report Card (2019)[3] to facilitate benchmarking between the Township of Muskoka Lakes and other Canadian municipalities.

Table 5. Rating Categories Based on Service Life and Condition

Rating Category	Percent of Remaining Service Life	Definition
Very Good	Over 80%	**Excellent Condition** – No cause for concern
Good	60% - 79%	**Adequate for Now** - Some assets elements show general signs of deterioration that require attention. A few elements exhibit deficiencies.
Fair	40% - 59%	**Requires Attention** – The assets in the system shows general signs of deterioration and require attention with some elements exhibiting significant deficiencies.
Poor	20% - 39%	**At Risk** - The assets in the system is in poor condition and mostly below standard, with many elements approaching the end of their service life. A large portion of the system exhibits significant deterioration.
Very Poor	<20%	**Unfit for Sustained Service** - The assets in the system are below standard condition with widespread signs of advanced deterioration. Many components in the system exhibit signs of imminent failure, which may be affecting service or increasing risks.

Understanding the percentage remaining life for each of the asset categories helps to provide insights into the age and condition distribution, as wells as potential areas that may need further investigation due to increasing probability of failure and subsequently deteriorating levels of service. It is important to note that some low-risk assets may also be feasible to run-to-failure, and though they may have exceeded their estimated service lives, they may be fully functional and meet level of service requirements for many years. Through effective asset management planning, Staff can diagnose and evaluate the impacts of such a scenario.

Table 6 provides an overview of the replacement value and condition rating of Township-owned assets, categorized into each asset

category. The replacement value, estimated average remaining service life, and summary of the poor and very poor categories are also shown. Overall, the Township's asset portfolio has approximately 59 per cent remaining service life (weighted by replacement value). Of the portfolio, approximately 9 per cent or $34,066,500 in assets are within the poor and very poor rating categories. When interpreting the ratings, it is important to note that there is a significant variation in the service lives of assets, ranging from under 10 years to over 100 years.

Table 6. Asset System Ratings Based on Service Life and Condition

Asset System	Asset Category	2020 Replacement Value	% Remaining Service Life	Rating category	% of Assets Below 40% Remaining Service Life	2020 Replacement Value
Transportation	Bridges and Culverts	$22,814,000	25%	Poor	23%	$5,206,000
	Roads	$329,204,500	64%	Good	8%	$25,806,300
	Railway Crossings	$90,000	64%	Good	0%	$0
	Sidewalks	$285,155	52%	Fair	1%	$1,300
	Signs	$357,600	57%	Fair	19%	$67,000
	Streetlighting	$1,321,775	87%	Very Good	0%	$0
Storm Water		$44,106,500	44%	Fair	7%	$2,985,900
Total		**$398,179,530**	**59%**	Fair	**9%**	**$34,066,500**

As can be seen from **Table 6,** the weighted average remaining service life for the Township's Transportation System assets is estimated to be approximately 59% of their design life. This translates to an overall condition rating of fair. However, as has been noted, this number is approximate, it is predominantly based upon age and lifecycle assumptions and does not necessarily mean that the assets are insufficiently supporting the service. In order to improve the confidence in this number, and better understand asset risks, the Township must continue to complete condition and performance assessments on a regular predictable basis in order to inventory and properly assess the condition of the assets and the time for replacement. For example, the majority of the urban drainage systems have never been assessed since the time of their construction. An initial effort was made late in 2021 to assess their condition. This will form the baseline condition. Regular updates will provide an indication of the rate of deterioration which can then be used to identify the need for and timing of future repairs and replacements.

The value of the assets with an estimated remaining service life below 40% amounts to approximately $34.1 M. This equates to the value of assets in poor or worse condition and in need of replacement. This should be considered as the backlog of immediate needs within the asset portfolio.

Table 7 provides a comparison between the Muskoka Lakes asset report card and the Canadian Infrastructure Report Card[3]. As can be seen, except for bridges and culverts, Muskoka Lakes has a lower percentage of assets in the poor and very poor rating categories compared to the national average.

Table 7. Township of Muskoka Lakes Compared to the 2019 Canadian Infrastructure Report Card

Asset System	Township of Muskoka Lakes		Canada- Wide	
	Percentage Poor and Very Poor Condition	Percentage Fair Condition	Percentage Poor and Very Poor Condition	Percentage Fair Condition
Bridges and Culverts	22.0	23.6	12.4	26.3
Roads	8.1	9.2	16.4	22.6
Stormwater	7.1	18.3	11.3	19.0

Source: CIRC (2019), Figure 5.

3. *Canadian Infrastructure Report Card: Informing the Future. Figure 5. [Online:* http://canadianinfrastructure.ca/en/index.html

As noted, in aggregate Table 7 would suggest that the Township's experience is not dissimilar to that of the municipalities that participated in the survey and in some asset categories may well be performing better than average. It should be noted that a significant portion of the Township's assets just barely make it into the range of good condition and are therefore not included in the table. There is a glut of assets which will pass into the fair or worse condition state in the next few years without intervention.

Figure 3 (right) summarizes the replacement value of assets within each of the condition rating categories. Presently, approximately 8 percent of Muskoka Lakes' Transportation System asset portfolio is in poor or very poor condition.

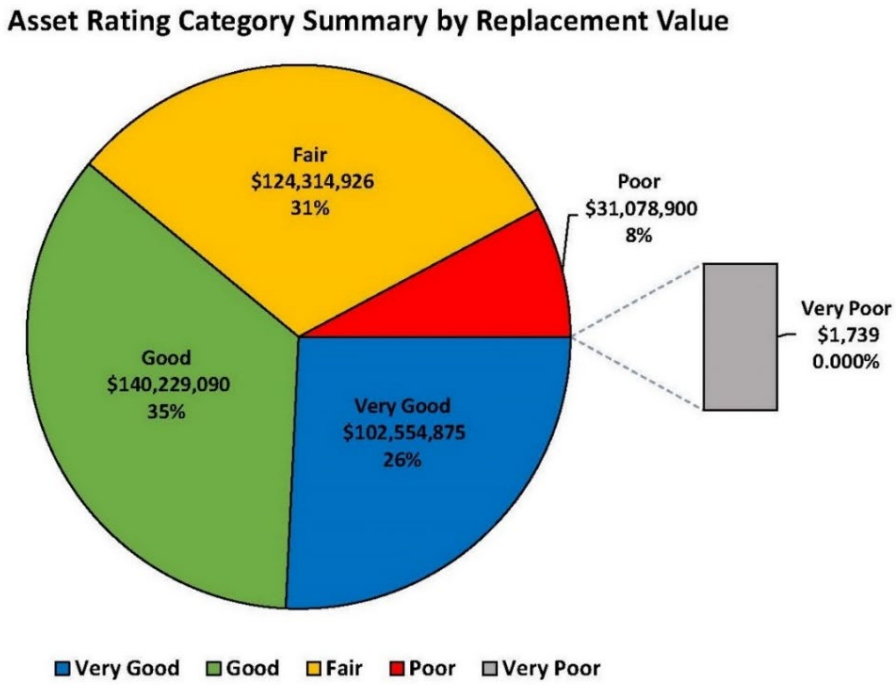


Figure 4 shows the breakdown of assets by rating category for each of the asset categories.

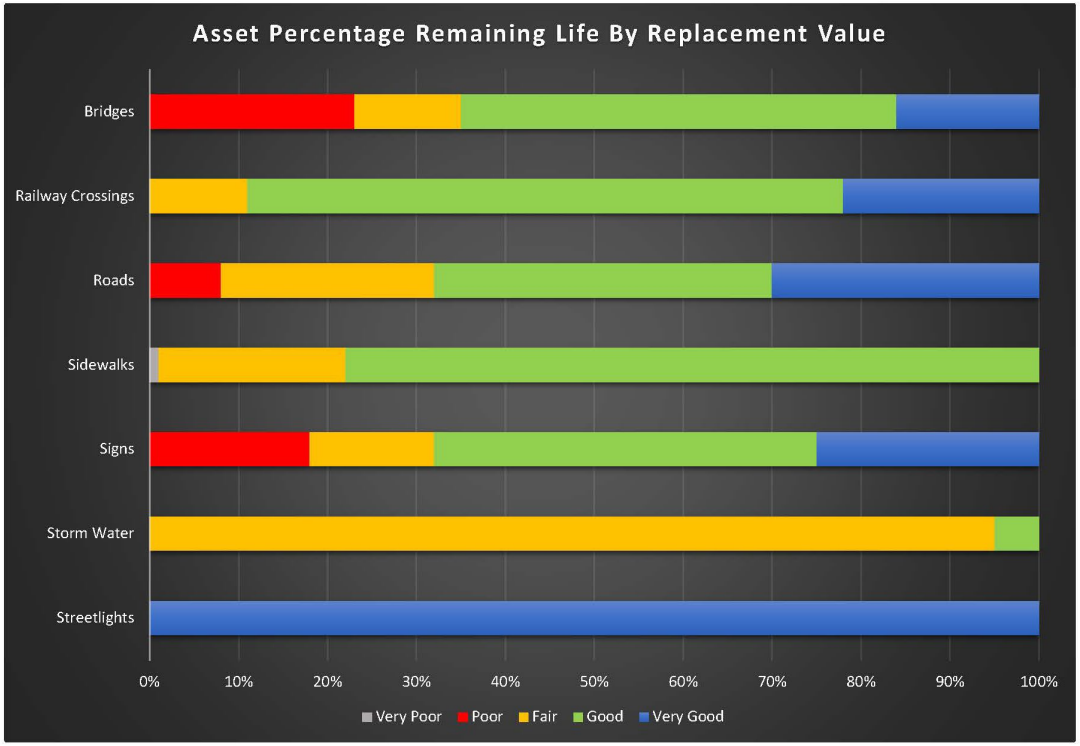


Figure 4. Asset Portfolio Percentage Remaining Life by Replacement Value

2.4 Asset Condition Assessment Practices

The Township uses several investigative techniques in order to determine and track the physical condition of its assets. For instance, bridges are evaluated every two years as required under the Bridges Act RSO 1990 in accordance with the methodology prescribed in the Ontario Structure Inspection Manual (OSIM). Pavements are rated according to the nature and extent of deterioration present and score calculated according to the formula prescribed in the MTO Manual for Condition Rating of Flexible Pavements. In the case of storm sewers, the interior of the pipes are inspected using closed circuit television (CCTV) inspections. These inspections are guided by standard principles of defect coding and condition rating that allow for a physical condition "score" for the assets to be developed. For assets, without a standardized approach to condition assessment scoring, information from visual inspections, failure records and other maintenance related observations were used in establishing the condition of the asset. The Township conducts various types of inspections, which can be broadly categorized as follows:

- **Operations and Maintenance (O&M) Inspections:** Visual inspections typically carried out by Township staff on a regular basis

according to operational needs. Scheduling is sporadic and standardized procedures need to be established to schedule inspections in accordance with regulatory requirements;

- **General Condition Assessments:** Assessments typically carried out by a third-party, generally covering the full inventory within an asset category at prescribed intervals based on regulatory requirements or industry best practice; and
- **Detailed Testing and Condition Assessments:** Specific testing or assessments carried out on a specific group of assets. Detailed condition assessments are not currently covered within this asset management plan however will be covered in the Asset System Management Plans to be developed by 2023.

Table 8 provides an overview of the current general condition assessments, as well as recommendations to move towards asset management best practice.

Table 8. Summary of Current Condition Assessments

Asset System	Condition Assessment Comment
Stormwater	Condition assessments have not been completed since construction. CCTV inspections initiated late in 2021. Condition assessments recommended every five years. Available data entered in GIS/AMS
Transportation	Bridges and structures condition assessments were last updated in 2021. While some retaining walls and outlet structures have been inspected, a full inventory and condition assessment program should be developed. Data in spreadsheets. Requires uploading in GIS/AMS. The public road network assessment was last updated in 2020. Unmaintained and private roads on public lands have not yet been included. Data in spreadsheets. Requires uploading in GIS/AMS. Sidewalks assessed annually for trip and fall hazards. Data partially entered into GIS/AMS. Railway crossings have recently been inspected by the railway authorities and it is recommended that a routine assessment program be established. Data partially entered into GIS/AMS. A first ever, full inventory of traffic signs was completed in 2021. Data entered in GIS/AMS. Condition is estimated based on reflectometer readings. Updating of the conditions assessments recommended every five years. A full inventory of streetlights including poles was completed in 2018. Data entered in GIS/AMS. A Transportation Master Plan is recommended every ten years. The first such master plan is scheduled for completion in 2023

2.5 Risk Assessment and Prioritization

By the definition asset management is the coordinated activity of an organization to realize value from assets. One fundamental component of realizing the value of assets is achieving the desired balance of cost, risk and performance. Risk-based planning therefore should form the foundation of a mature asset management program.

The Township should adopt an Enterprise Risk Management Framework which is based on a common language within the organization pertaining to risks. It should include business processes and tools to evaluate the likelihood and consequences of failure of assets owned by the Township. The defined processes will assist in predictive modeling, and will support optimized decision making. **Table 9** illustrates a proposed risk management framework that is common in many jurisdictions.

Probability of Failure	Consequence of Failure				
	Insignificant	Minor	Moderate	Major	Significant
Rare	L	L	M	M	H
Unlikely	L	M	M	M	H
Possible	L	M	M	H	E
Likely	M	M	H	H	E
Almost Certain	M	H	H	E	E

Table 9: Recommended Risk Management Framework for Asset Management Decision Making

On the basis of the above noted framework, the probability and consequence of failure was assessed for each asset. In all cases current condition was used to assess the probability of failure. The in the case of bridges and culverts the consequence of failure was assessed in terms the ability to detour around the site and the length of the detour that would be required if the structure failed. In the case of roads, traffic volume was used as an indicator of the numbers of trips that might be interrupted as a result of a failure. In the case of drainage systems an assessment was made of the potential for flooding affecting access and property. **Table 10** gives an assessment of the risk across each asset class in the transportation category.

Table 10: Risk Factors for Transportation

Asset System	Probability of Failure	Consequence of Failure	Risk
Bridges and Culverts	Low	Moderate	Moderate
Roads	Low	Low	Low
Storm Water	Moderate	Moderate	Moderate

2.6 Data Confidence and Data Gaps

As with any data-intensive quantitative analysis, the results are only as good as the data that they are based upon. The Township recognizes that there are gaps in the background information that has been used for the development of this asset management plan, which may impact the validity of the results. To overcome this challenge, and to not present misleading information, a standardized approach has been adopted to measure the confidence in the data and then to develop work plan to improve the confidence in the data for future iterations. This approach gives the reader a measure of how accurate the results of the analysis may be, and also aids in understanding deficiencies in the data and identifying areas for improvement.

Table 11 provides an overview of the inventory data confidence rating scales and descriptions.

Table 11. Inventory Data Confidence Rating Scale

Data Quality Rating	Equivalent Percentage	Description
5	80%-100%	No assumptions, with the age and value known. Reliable data source (e.g. structural report, building condition assessment, database with proven track record).
4	60%-79%	No assumptions, with the age and value known. Data is moderately reliable (e.g. out of date inventory or study, purchasing records, and internally maintained records).
3	40%-59%	One reliable data source, including minor assumptions from moderately reliable source (e.g. out of date inventory or study, purchasing records, internally maintained records).
2	20%-39%	Data from significantly out of date documents (i.e. seven or more years), relatively unreliable documents, or anecdotal, but both age and replacement value.
1	1%-19%	Moderately reliable data available for age or value, but not both. Second item not from a reliable source.
0	0%	No data available.

The data was rated using a numerical scale to indicate levels of confidence in the reliability of the information. As previously mentioned, data was gathered from a wide range of sources. Preference was given to the most current condition assessments, purchasing documents, and maintenance records. It was also occasionally necessary to utilize documentation that is, by industry standards, out of date, or reach out to staff that may be knowledgeable about the assets in question. While all these resources provide valuable insight into the history of the asset, there remains a degree of uncertainty due to the age of these documents, or fallibility of human memory. As such, efforts were taken to track information sources, and a rating assigned based on the type and reliability of the source of information.

There are a few key factors that contribute to the confidence rating, one being the age of the data source. The more recently completed or comprehensively updated a source was, the greater the confidence in its accuracy. For example, a bridge or arena condition assessment for a facility completed in the previous year would receive a rating of five, whereas a condition assessment for a facility completed 5 years ago would receive a four.

Another factor is the type, amount, and number of assumptions made, which are often interrelated issues in this process. Frequently, when information is gathered from a variety of sources there is a lower rating because more assumptions were required to fill any gaps. For example, in some instances it was necessary to pull value information from insurance documents. This information source does not typically provide age, or upgrade, information, meaning it is necessary to source this from elsewhere. The use of insurance documents was typically due to there not being available building or structural assessments, or that those documents were out of date. Therefore, age information, while likely available for the original construction of the facility, will not necessarily reflect any renewal or rehabilitation work, and are therefore less reliable. Additionally, while reasonably accurate in providing a baseline cost for the asset, these sources are not intended to be used as a valuation system for asset management or construction, therefore not suited to purpose. In this scenario, depending on the combination of assumptions, the data source would typically be rated either a four or a three.

Finally, there are instances where information on either age or value were known, but not both (and occasionally, not either). In these instances typically stakeholders were consulted and best efforts were made to fill the gaps. Assets with information generated in this manner were rated with lower confidence ratings. The asset confidence ratings were the collated to establish the weighted average rating (by asset replacement value) for the overall category.

Table 12 provides the confidence ratings for each of the asset systems including comments summarizing the causes for the ratings.

Asset System	Average Data Confidence Percentage	Comments
Bridges and Culverts	85%	Inventory information has been kept historically and is considered accurate. The data is updates biennially.
Roads	75%	Inventory information is based on data collected in the field and condition assessments completed in late 2019 and early 2020. The data is considered accurate.
Stormwater	20%	Most location information is available based on assumptions in terms of quantity and condition. Little or no age or condition information is available.

Table 12. Inventory Data Confidence Rating for Asset Systems

The Transportation System asset information has been consistently complied and updated with increasing rigor since the Township's initial core infrastructure plan was developed in 2014. Condition assessments are based on field data collected. Many of the most recent assessments were completed in late 2019 and early 2020 and are therefore considered accurate. In contrast, historical data particularly as it relates to age is limited or non-existent and is therefore inferred. Costs are based on tender results in the recent past and while not precise, they provide a reasonable estimate of the expected cost under normal market conditions. The overall confidence rating with respect to the infrastructure data in these areas is rated as good to very good at 75% to 85%.

Following Policy C-FS-13 and the approval of this plan, the principles of asset management will be eventually incorporated into all applicable routine business practices of all Township operations. The deployment of the CityWorks AMS/WMS will greatly assist in improving the quantity and quality of asset information in the coming years.

2.7 Asset Category Condition Summaries

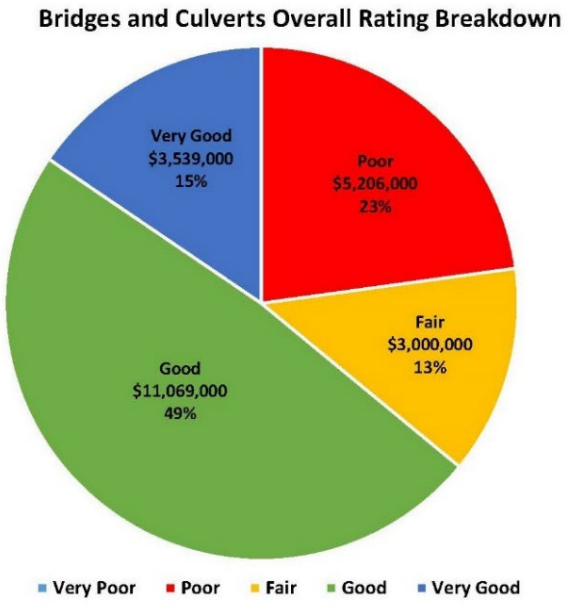
The following section summarizes the available replacement value and condition information specific to each asset Category and their major asset types.

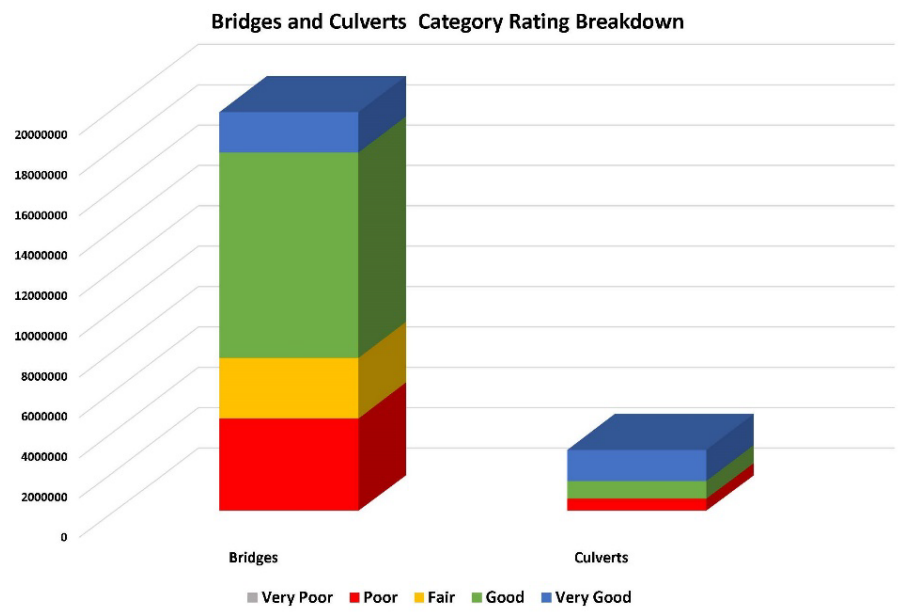
2.7.1 Bridges and Culverts

Replacement Value:	**$22,814,000**	**Data Confidence Grade:**	85%

Summary:

The Township's inventory of bridges and culverts consists of 13 bridges and 8 culverts having spans in excess of 3.0 m. Bridges account for $19.8 M of the total $22.8 M of the asset class value. Approximately 60% of the inventory is in excess of 50 years with 40% over 80 years old. Despite its age, the inventory is in relatively good condition with 64% rated as being in good or very good condition. Of the balance of the inventory 23% of the area of the structures is considered in poor or very poor condition and in need of replacement.



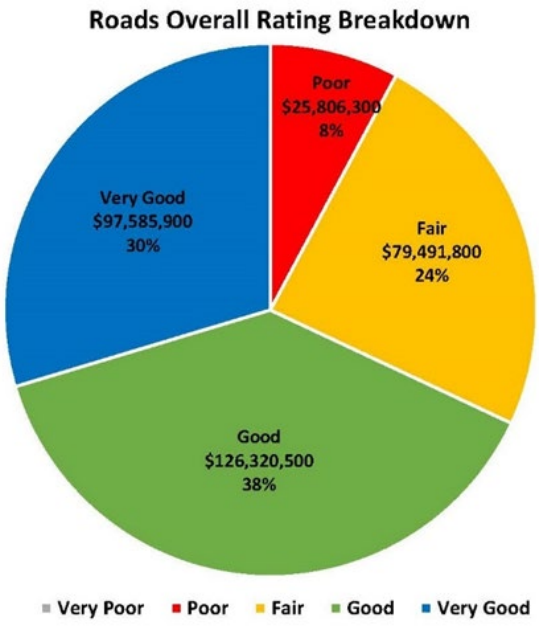


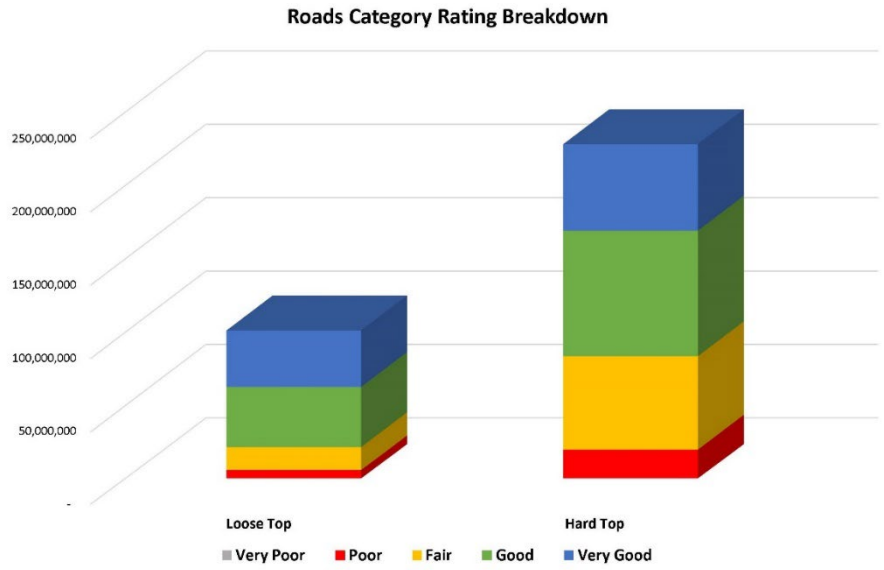
2.7.2 Roads

Replacement Value:	$329,204,500	Data Confidence Grade:	75%

Summary:

This asset class is made up of 229.1 km of hardtop and 126.9 km of loose top publically maintained roads located in the Township's rights of way. Roads are by far the largest single asset class with a total replacement value in excess of $329 M. The majority of the road lengths (50.2%) are beyond the end of their useful lives. Notwithstanding their age, a majority of the roads (68% or $223.9 M) are considered to be in good or very good condition and fit for continued service.



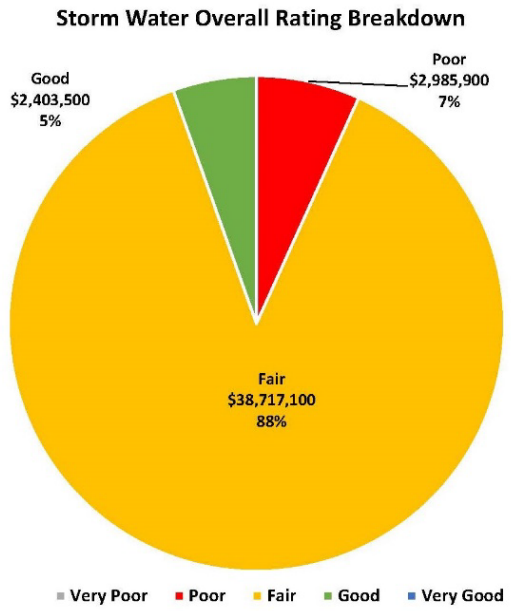


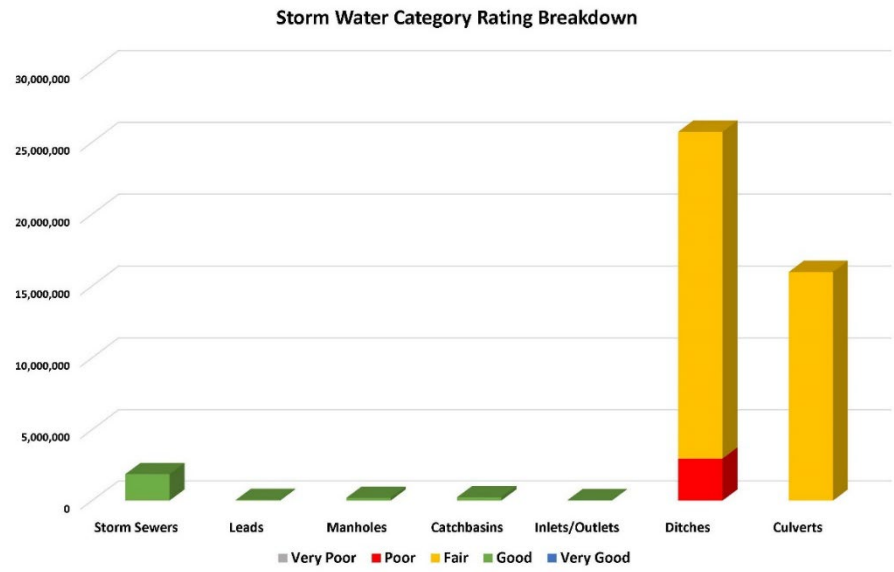
2.7.3 Stormwater

Replacement Value:	$44,106,500	Data Confidence Grade:	20%

Summary:

The storm water category is made up of 649.59 km open (ditches) and 2.42 km of closed (storm sewer) drainage systems. The rural drainage systems are in overall fair condition. A lack of attention to these systems in the past significantly impacts their efficiency and effectiveness. The closed drainage systems are located in the three urban areas (Bala, Port Carling and Windermere). Other than the approximate location, little is known of these systems as no works has been performed on them since their construction. An inspection program using CCTV was initiated late in 2021 to remedy the situation and results are expected in 2022. The data will be updated as soon as new information becomes available.

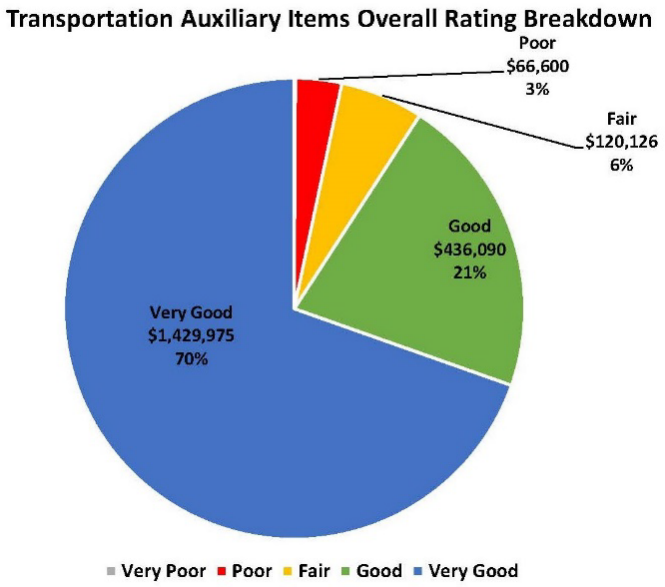


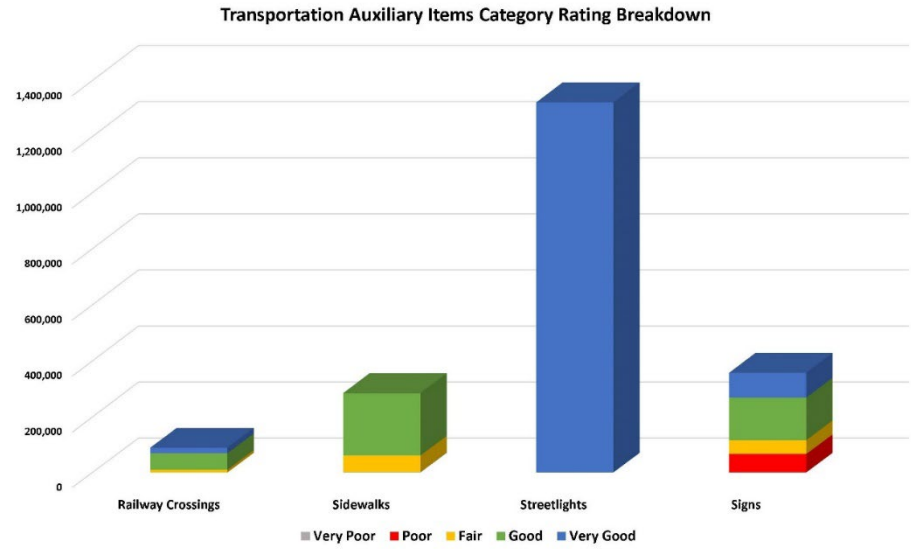


2.7.4 Transportation Auxiliary Items

Replacement Value:	$2,054,530	Data Confidence Grade:	75%

This asset category is a consolidation of a number of smaller value assets relating to the Townships road inventory and includes railway crossings, sidewalks, signs and streetlights. Generally, the majority of the assets (91% or $1.9 M) are considered to be in good or better condition. This can be attributed to the streetlight inventory which was upgraded to LED luminaires in 2018 and are in very good condition. As part of the development of the AMP the first ever of inventory of the Township's signage was completed. These assets will require attention in the near term.

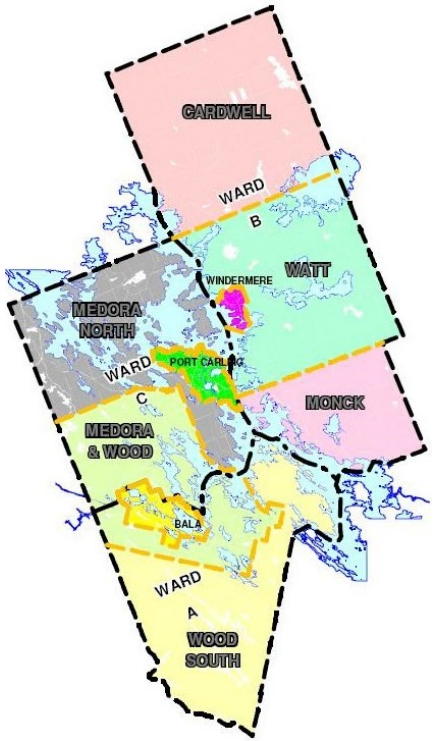




2.8 Updating Asset Data

As previously mentioned, there are currently a variety of data sources that contributed to this plan. At the beginning of the process, the vast majority of the records were in the form of hardcopy reports. One of the initiatives started as part of the preparation of this report was the establishment of a Geographic Information System (GIS) database, which could be used to store the records associated with the asset portfolio. At this point, approximately 70 percent of the data has been transferred to the system. The development of the system was completed with a significant reliance on contracted services. This practice should continue unless/until the Township retains a staff resource to maintain the system into the future.

Another key data source was MAM work management software system. This software system is obsolete and unstable and is being replaced in 2022 with the CityWorks Computerized Asset/Maintenance Management System. Bringing the new system online will enable staff to update the database on an ongoing basis as part of the normal workflows. This will allow for more current data and more accurate and timely decision making.



SECTION 3: LEVELS OF SERVICE

3 Levels of Service

In Section 2 (State of Local Infrastructure), the value and condition of the Township's infrastructure was identified based on the expected life span of the assets. Section 3 of the Asset Management Plan builds on Section 2 by defining current practices with respect to the minimum acceptable condition during their expected lifespan. In other words this Section answers the question "How are the assets performing?" By way of example, the expected lifespan of the surface of a road may be 20 years, but this expected life is only meaningful if the driving surface remains in an acceptable condition over that time frame. What constitutes an acceptable condition is known as the level of service.

Levels of service can mean different things in different contexts. As it relates to asset management, best practice recommends that levels of service focus on quantifying asset performance criteria and how deficiencies are addressed. In the Township's asset management context, levels of service should be defined to include:

- Target Condition - what properly functioning assets looks like and achieve;
- Performance Measure - how the target condition is measured; and
- Target - the minimum performance or physical characteristic threshold for an asset before repair, replacement or maintenance is required, and/or the timeframe to restore an asset to proper performance.
- Key drivers for asset management levels of service should, at a minimum, include:
- Regulatory requirements;
- Best practices for sustainable asset management;
- Community satisfaction; and
- Municipal priorities such as environmental benefits, community benefits and beautification.

The Township's levels of service should be first and foremost focused on meeting regulatory requirements. As regulatory requirements are more focused on the safety than sustainable long term asset condition or providing quality of life in the community, the Township should also have levels of service for asset condition and community satisfaction.

Acceptability in the eyes of the public is usually quantified by conducting regular community satisfaction surveys. Surveys should be conducted every few years to provide high-level indication of whether the asset management levels of service and maintenance are meeting the expectations of the residents. As an option this could be coordinated with updates to the various Master Plans that the Township has undertaken or committed to.

This section will present levels of service for assets as they exist today in Muskoka Lakes as a starting point for future improvements. Levels of service for each Asset Class, and asset Subclass where applicable, are described in Sections 3.1 to 3.3. While some asset classes currently have at least a basic level of service defined most others do not. Even within those asset classes, where the level of service is defined, some assets are more thoroughly covered than others. In many cases, the existing levels of service are incomplete, such as where there may be performance measures but no associated targets. These performance measures may still be valuable even without a firm target value, as they allow us to look at trends, comparing current results with those from previous years.

Moving forward, there is an opportunity for all asset classes to incorporate methodologies from other parts of the organization, perform benchmarking and improve comprehensiveness. The Township should be undertaking levels of service studies for the roadway system, parks as well as a fleet utilization study in 2022. The results of these studies should be integrated in future updated versions of the Asset Management Plan.

3.1 Defining Levels of Service

One of the Township's key goals is to understand the balance between the asset cost, performance and risk. Well-defined levels of service can be used to:

- Inform decision makers and ratepayers of the current level of service provided and any proposed changes to level of service and the associated cost;
- Measure performance against defined levels of service;
- Identify the costs and benefits of the services; and
- Enable customers to consider the level of service provided within the context of affordability.

The goal should be to establish level of service requirements and better understand the relationship between the levels of service and costs to provide the service. This will be achieved through the completion of master plans and other reviews planned to be completed over the next several years. In the interim, Staff are developing tools and techniques to predictively model levels of service over time. The key initiatives planned included:

- Corporate level of service initiative (Corporate Asset Management);

- Service reviews; and
- Corporate performance and accountability frameworks.

Under the Corporate Asset Management Program, levels of service will be guided by service attributes, level of service statements, and performance measures as shown in **Table 13**.

Table 13. Concepts of Levels of Service

Concept	Characteristics	Examples
Key Service Attributes	Aspects or characteristics of a service.	Accessibility, affordability/cost efficiency, quality, quantity, reliability, responsiveness, safety.
Levels of Service Statement	What the organization intends to deliver. Levels of service statements describe attributes of the service from a customer point of view.	Provision of high quality recreation experiences. Provision of high-speed internet access to the Township Office.
Customer Performance Measure	How the customer receives or experiences the service. Customer measures are generally those that would be uses in public documents, and should be easily understood by the average person.	Tangible measures: Appearance of facilities, frequency of disruptions, incidence of illness Intangible measures: Staff attitude, ease of receiving the service, etc.
Technical performance measure	What the organization does to deliver the service. These measures support customer measures and tend to be used internally to measure performance against service levels	Number of times public washrooms are cleaned each day, average wait times at intersections, the average condition rating of playgrounds.

The formal definitions of a level of service project is required to be finalized by the middle of 2024. The register of Levels of Service Frameworks, developed for each of the critical, asset-intensive services identified through the development of the project, will be a living database.

3.2 Bridges and Culverts

3.2.1. Target Condition and Function

A bridge that is in a good state of repair has approaches and travelled surfaces that smoothly transition on and off the structure, are clean, well-drained, durable and safe. The structure is stable without significant defects that would draw into question its safety. The waterway the structure spans is unobstructed and free flowing so as to not cause a backup or flooding. All necessary protective measures are in place. Regulatory and warning signs are in place and clearly visible.

3.2.2. Visualization of Condition States

The condition of a bridge is typically expressed in terms of a Bridge Condition Index or BCI. The BCI is a mathematically derived condition rating of the bridge on a scale of 1 to 100 and is a weighted average of the condition of the primary components of the bridge. The Bridge Sufficiency Index is an extension of the principle and incorporates the degree to which the structure complies with current standards and the economic significance of the structure. The BSI is a more complete assessment of the structure and its importance to the community.

Figure 5 is indicative of a bridge in very good condition. The structure in question (Beaumaris Bridge post 2020 rehabilitation) meets the above noted definition of a bridge in a good state of repair. The structure generally meets most of the current standards for the primary components.

Figure 5: Beaumaris Bridge; Very Good Condition, BSI 75.1

As the structure is used and with increasing age, the condition of the structure deteriorates. Figure 6 shows the Dee River Bridge on Rostrevor Rd. The bridge is considered in fair to good condition with some relatively minor defects. Provided that the defects are addressed at an early juncture and are not allowed to undermine the condition of other components of the bridge, the bridge should be able to provide acceptable service for the foreseeable future.

Figure 6: Dee River Bridge, Fair to Good Condition, BSI 65.7

With further use and as a structure ages, its condition continues to deteriorate and drops into the fair state. Figure 7 is of the Rosseau Lake Road 3 Bridge which is considered to be in fair condition. The deterioration of the components starts to affect the structural integrity of the bridge resulting in the need to reduce the allowable load on the structure. The condition also begins to have an economic impact on the community, limiting the degree to which it can be used. The rehabilitation or replacement should be considered at that point. In this case, the structure is restricted to a maximum load of 12 tonnes. Restoration of the structure to full capability becomes correspondingly more expensive with increasing age and deterioration.

Figure 7: Rosseau Lake Road 3 Bridge; Fair Condition, BSI 52.1

With further deterioration the load carrying capacity is compromised. Figure 8 shows the Bala Falls Bridge which is assessed in being in fair to poor condition. At this point the condition of the structure is impacting the community to a significant degree and replacement of the structure is typically the only viable option.

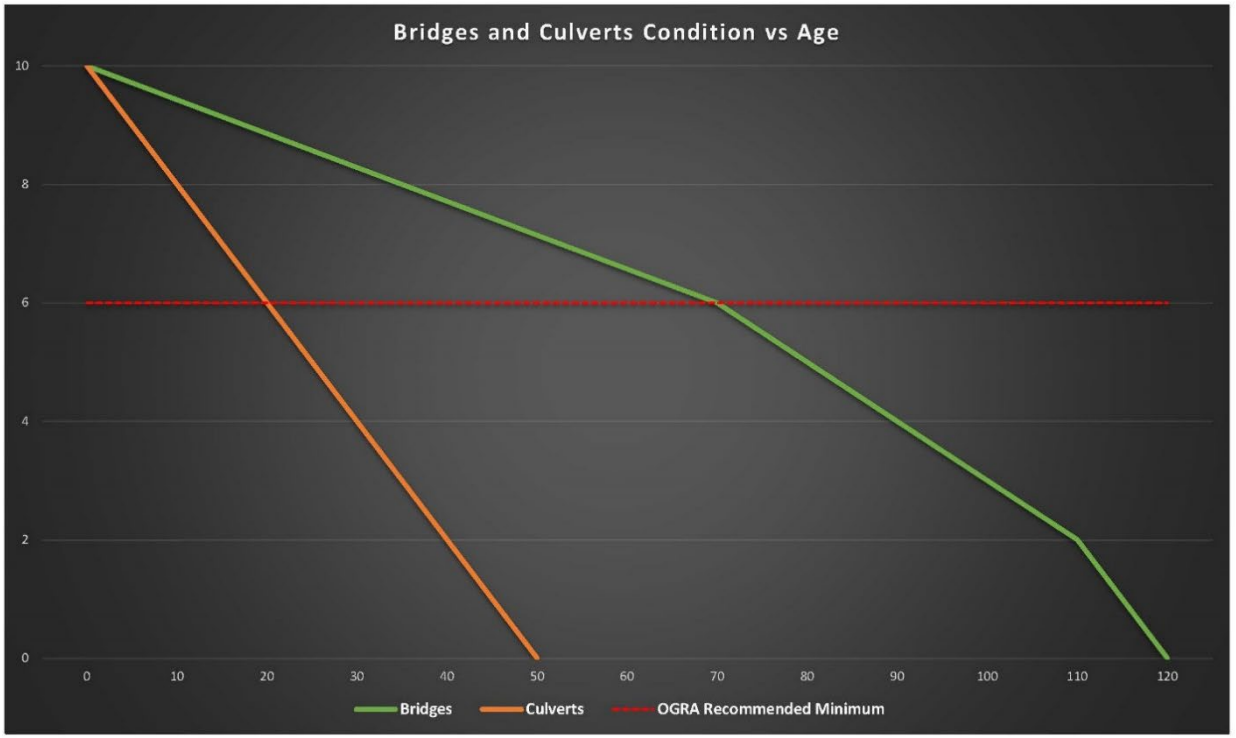
Figure 8: Bala Falls Road Bridge, Fair to Poor Condition BSI 43.6

Figure 9: Dark Bay Road Culvert; Poor Condition, BSI < 40

Figure 9 is of the end of the barrel of the Dark Bay Road Bridge. The bottom of the structure is completely rusted through to the extent that the structural integrity of the structure is compromised. Replacement of the structure in the near term is the only viable alternative.

Figure 10 illustrates the actual performance of the Township's bridge and culvert structures over time, based on the deterioration profile of the inventory. The data that the chart is based upon is limited and will improve over time with the use of the CityWorks Works and Asset Management System. Despite its limitations, it is indicative of the state of the inventory and will be useful in the need and priority for future works.

Figure 10: Bridge and Culverts Generalized Deterioration Profile



3.2.3. Levels of Service

- Levels of service for the bridge system (Table 14) are primarily defined by the:
- Bridge Act RSO 1990;
- Canadian Highway Bridge Design Code (CHBDC) as amended by the MTO Structural Manual; and
- Minimum Maintenance Standard (MMS).
- These standards are focused on safety rather than long-term sustainability of the asset. In order to ensure that the Township obtains the full value of the investment it has made in its structures, it should adopt additional levels of service that go beyond

the legislated requirements for the primary components of the structure. Further development of levels of service will occur in 2023 for incorporation in the 2024 version of the asset management plan as required by O. Reg. 588/17. That analysis will expand condition based levels of service to a wider range of assets, including establishing target conditions and performance measures.

Table 14 Roadway System Levels of Service and Community Satisfaction Measures

Asset	Performance Measure	Measure Type	Target	Results (2019)
Bridge System	Overall System Condition: % in Good or Very Good Condition	Condition	> 70%	2020: 67%
Bridges & Culverts	Canadian Highway Bridge Design Code (CHBDC) as amended by the MTO Structural Manual	Regulatory	Meet or exceed CHBDC Standards	Reportable on a case by case basis
	Ontario Minimum Maintenance Standards (MMS) for Deck Spalls, Cracks, Surface Discontinuities, Debris	Regulatory	Meet or exceed Minimum Maintenance Standards (MMS)	Reportable on a case by case basis
	Bridge Condition Index	Condition	No target defined	2020: 69
	Resident Satisfaction; % Satisfied or Very Satisfied	Community Survey	No target defined	No Report

3.2.4. External Trends and Issues

The bridges and culverts are integrated with the adjacent road infrastructure as well as any private or public utilities that may be attached to the structures. The levels of service for the structure can therefore affect the condition and longevity of these other assets. For example, runoff from the bridge surface onto the approaches can cause damage to the receiving structures and adjacent assets. Conversely, failure to meet the levels of service for the approach can cause damages to the structure and shorten its life expectancy.

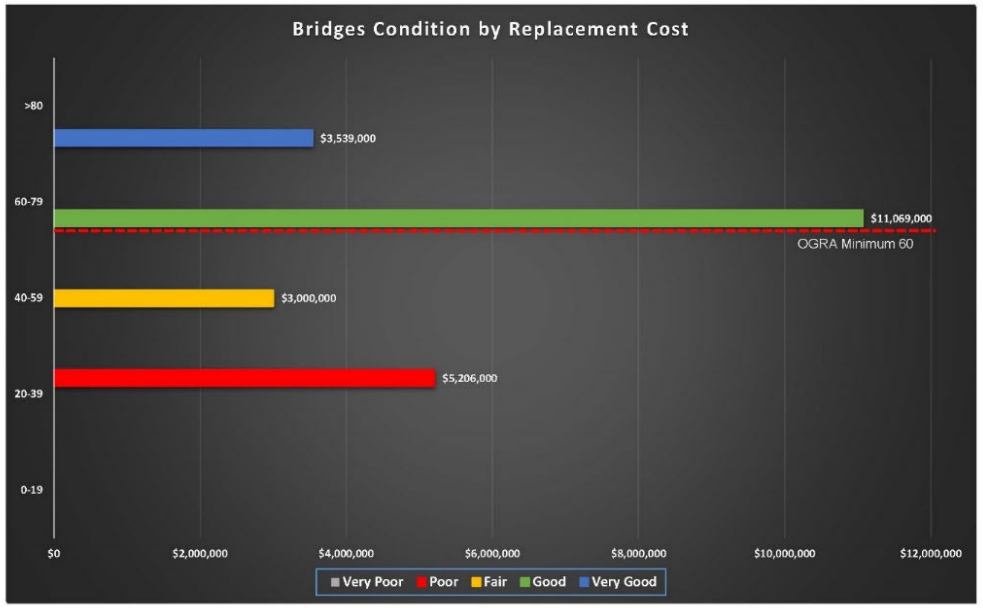
There are other external influences on the bridge system that need to be considered when planning for levels of service. One is the relationship between the Township of Muskoka Lakes and District of Muskoka. The District owns and operates the arterial roads, the water and wastewater systems and the public transit systems. There is an extra level of coordination required when roadwork is necessary on a road that connects to a District road or includes underground utilities.

Climate change will also have a significant and ever increasing influence on these structures, with the risk of flooding that could cause serious damage to the structures and the roadway approaches. This will drive changes to design and construction specifications.

3.2.5. Key Findings

Figure 11 illustrates the value of the bridge and culvert inventory in each condition state. At present, the estimated value of the needs for the Township's Bridge's and culverts is in excess of $5.2 M. Past practice has been to focus almost exclusively on safety and only consider the asset for replacement after it falls into the poor or very poor condition state. This approach has resulted in a poor level of service to the community, increased operating and maintenance expenditures and a higher lifecycle cost. Industry standards would suggest that the targets should be that all structure should be kept in a good condition state or better. If this becomes the target, the backlog of needs increases from $5.2 M to $8.2 M.

Figure 11: Bridge and Culvert Value According to Condition State



The maturity of the asset management practices for bridge assets is a reflection of the high level of importance placed on these assets. The majority of the practices however are focused on safety and not necessarily on obtaining the greatest value for the expenditure of public funds. The concept of level of service should be expanded to include safety, condition and resident satisfaction performance measures. The following are two major opportunities for improvement:

- many of the performance measures lack defined targets and establishing targets will provide a clearer measure of whether roadway assets are performing adequately; and
- there is a data management challenge with reporting on regulatory performance. The work is being done to meet the Ontario Minimum Maintenance Standards, but the system of tracking work orders for the numerous minor repairs that need to be performed on the bridge and culvert system each year requires new data management processes and tools. However, improved reporting and data management through the new CityWorks Works and Asset Management System is expected.

3.3 Roads

3.3.1 Target Condition and Function

A well-functioning roadway system has roads and sidewalks that are smooth, clean, safe, drain well; durable, and well lit where appropriate. Appropriate and visible traffic signage is in place to provide consistent control of intersections, clear direction to motorists and pedestrians and adequate warning to motorists of non-standard conditions.

3.3.2 Visualizing Levels of Service

Although the idea of a Pavement Condition Index (PCI) is understandable by road building professionals, the index on its own may be somewhat abstract for a person unfamiliar with pavement science. The PCI is a rating on a scale of 1 to 10 which documents the condition of the pavement and its underlying structure based on the nature and extent of the deterioration present. It is appropriate to provide examples of the various condition states to assist the public to visualize what the ranges of score mean from a practical perspective. To simplify the scales, it is common practice to split the results into five categories (from Very Good to Very Poor) according to the scale presented in **Table 5.**

Figure 12 shows an example of a road segment that is in very good condition, which is often the condition for the first one to five years of the road surface life.

Figure 12 Example of Road Segment in Very Good Category (Condition Rating ≥ 8.0)

Source: Google (2018)[16]

As the asset continues to age, some wear may appear on the surface including defects at the curb or pavement edge. At this stage, it is generally prudent to crack seal any locations with cracking to slow down the rate of deterioration. An example of a road in good condition is shown in **Figure 13**.

Figure 13. Example of Road Segment in Good Category (Condition Rating 6.0 to 7.9)
Source: Google (2019)

Over time, small cracks may propagate to form is technically termed alligator cracking (due to the appearance of "scales" due to multiple interrelated cracks). In addition, minor patches may be required to restore pot holes caused structural failures or where there have been cuts into the surface for drainage or utility purposes. An example of a segment in fair condition is shown in **Figure 14**.

Figure 14 Example of Road Segment in Fair Category (Condition Rating 40.0 to 59.9
Source: Google (2019)[17]

As the cracks propagate further, they begin to span across the entire surface and allow the ingress of water into the road bed. Distortions in the surface may result due to failure of the base below the road surface. Segments begin to separate and potholes may form, resulting in increasing maintenance requirements. This would result in a relatively uncomfortable driving experience with frequent bumps or depressions. An example is shown in **Figure 15**.

Figure 15: Example of Road Segment in Poor Category (Condition Rating 2.0 to 3.9)
Source: TML Picture 2020 Eveleigh Rd

Finally, the multiple cracks may result in significant potholes across the entire road surface, resulting in an uncomfortable drive with constant bumps or depression significantly impacting the driving and aesthetic experience. **Figure 16** provides an example of a road in very poor condition.

Figure 16. Example of Road Segment in Very Poor (Condition Rating <2.0)
Source: Moon River Rd 2020

Figure 17 illustrates the actual performance of the Township's roads over time based on the deterioration profile of the inventory. The data on which the chart is based is limited and will improve over time with the use of the CityWorks Works and Asset Management System. Despite its limitations, it is indicative of the state of the inventory and will be useful in the need for future works.

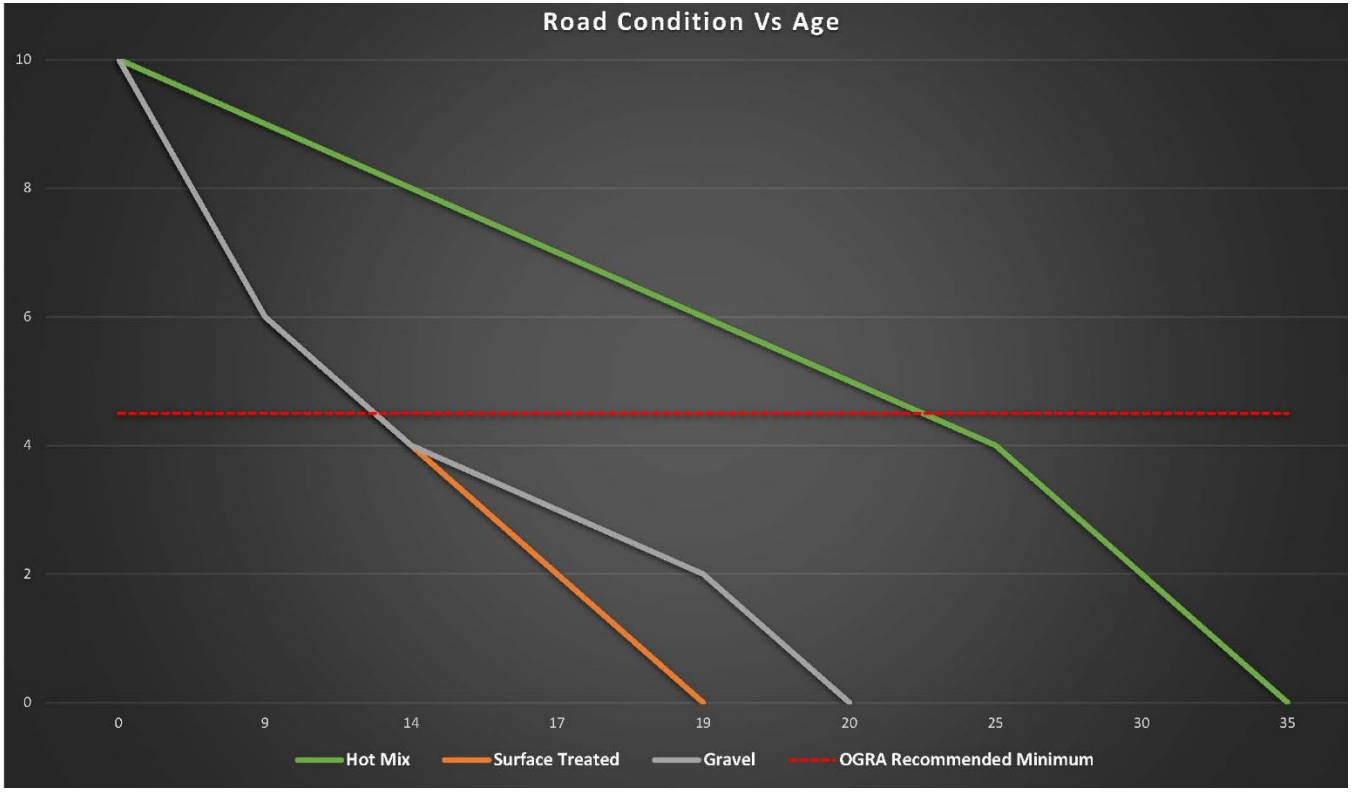


Figure 17: Deterioration Curves for Township of Muskoka Lakes Roads

3.3.3 Levels of Service

Levels of service for Muskoka Lakes' roadway system (Table 15) are primarily defined by the Ontario Minimum Maintenance Standard (MMS), the MTO/Transportation Association of Canada (TAC) Geometric Highway Design Manual and the Ontario Traffic Manual. As was previously observed, the standards are focused on safety and avoidance of liability claims rather than achieving long-term sustainability of asset condition and quality of service. While the Township strives to maintain its roads and related infrastructure to meet the minimum requirements, additional levels of service for the roadway surface and sidewalks that go beyond the legislated requirements should be considered for adoption. Further development of levels of service for the roadway system, as well as a community survey on satisfaction with Muskoka Lakes' roads, will occur as part of the Transportation Master Plan and the operational levels of service assessment which will be required for the 2024 version of the AMP in order to comply with O. Reg 588/17 requirements. This work will expand on the condition based levels of service to a wider range of roadway system assets and including design standards, target conditions and performance measures.

Table 15 Roadway System Levels of Service and Community Satisfaction Measures

Road Bed & Road Surface	Ontario Minimum Maintenance Standards (MMS) for Potholes, Shoulder Drop-offs, Cracks, Debris, Surface Discontinuities	Regulatory	Meet or exceed Minimum Maintenance Standards (MMS)	Reportable on a case by case basis
	Pavement Condition Index (PCI)	Condition	No target defined	2020:
	Road Condition: % in Good or Very Good Condition	Condition	No target defined	2020:
	Road Quality and Maintenance:	Community Survey	No target defined	No Report
Railway Crossings	Transport Canada At Grade Crossing Standards	Regulatory	Meet or exceed At Grade Crossing Standards	2020:
Sidewalks	Ontario Minimum Maintenance Standards (MMS) for Sidewalk surface discontinuities	Regulatory	Meet or exceed Minimum Maintenance Standards (MMS)	Reportable on a case by case basis
	Sidewalk Condition Rating	Condition	No target defined	Reportable on a case by case basis
	Sidewalks: % Satisfied or Very Satisfied	Community Survey	No target defined	No Report
Signs	Ontario Minimum Maintenance Standards (MMS), for traffic signs	Regulatory	Meet or exceed Minimum Maintenance Standards (MMS)	Reportable on a case by case basis
Street Lights	Ontario Minimum Maintenance Standards (MMS) for Luminaires	Regulatory	Meet or exceed Minimum Maintenance Standards (MMS)	2020:
	Streetlighting: % Satisfied or Very Satisfied	Community Survey	No target defined	No Report

3.3.4 External Trends and Issues

The Roadway System is integrated with the other infrastructure located under the road surface, such as water, wastewater and utilities (in urban areas) and stormwater assets. The levels of service for the roadway can therefore affect the condition and longevity of these other assets. For example inadequate provision for stormwater drainage can cause water infiltration from the road surface into the road bed resulting in poor performance of the road and damage the underground assets. Conversely, failure to meet the levels of service for water, wastewater and stormwater assets can damage the roadway itself, with the potential for water leaking from pipes and undermining the road bed.

There are some external influences on the Roadway System that need to be considered when planning for levels of service. One is the relationship between the Township of Muskoka Lakes and District of Muskoka. The District owns and operates the water and wastewater systems. It also takes advantage of the Township's stormwater drainage system. This necessitates an extra level of coordination required when work is required on roads that contains district infrastructure or is impacted by a District road.

Climate change is increasingly having an influence on the design and construction of the road system. With the increased intensity and frequency of the significant weather events risk of flooding and blockage of the roadway due to deadfalls etc is increasing. Consideration will have given to driving changes to design, construction and maintenance specifications.

3.3.5 Key Findings

A condition assessment of the road network was completed in September 2019, which has provided a Township-wide insight into the current roads levels of service and backlog. Based upon the condition assessments completed, a visual map of the entire Township can be established to identify the overall level of service provided. Through the level of service initiative, the Staff plans to work with Council and the community to establish the desired target levels of service for roads, among other asset types. A map of the overall road condition, categorized into the five condition scales is shown in **Figures 18-22: Thematic Maps of Road Conditions**

Figure 18 Bala

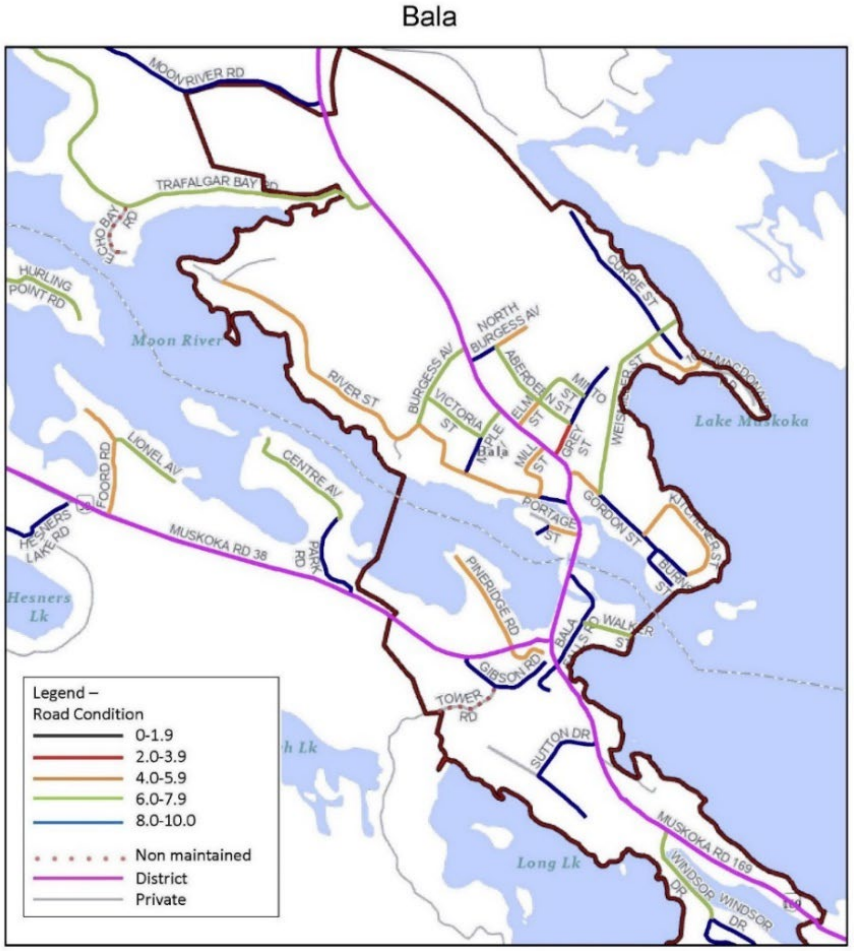


Figure 19 Milford Bay

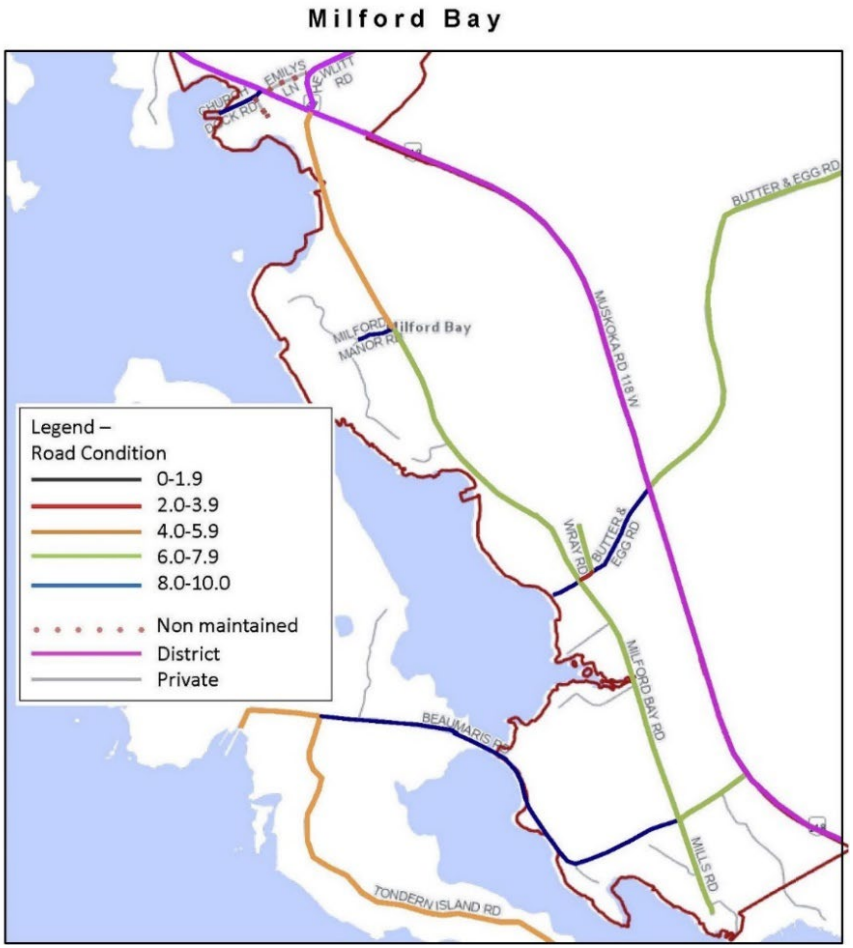


Figure 20 Port Carling

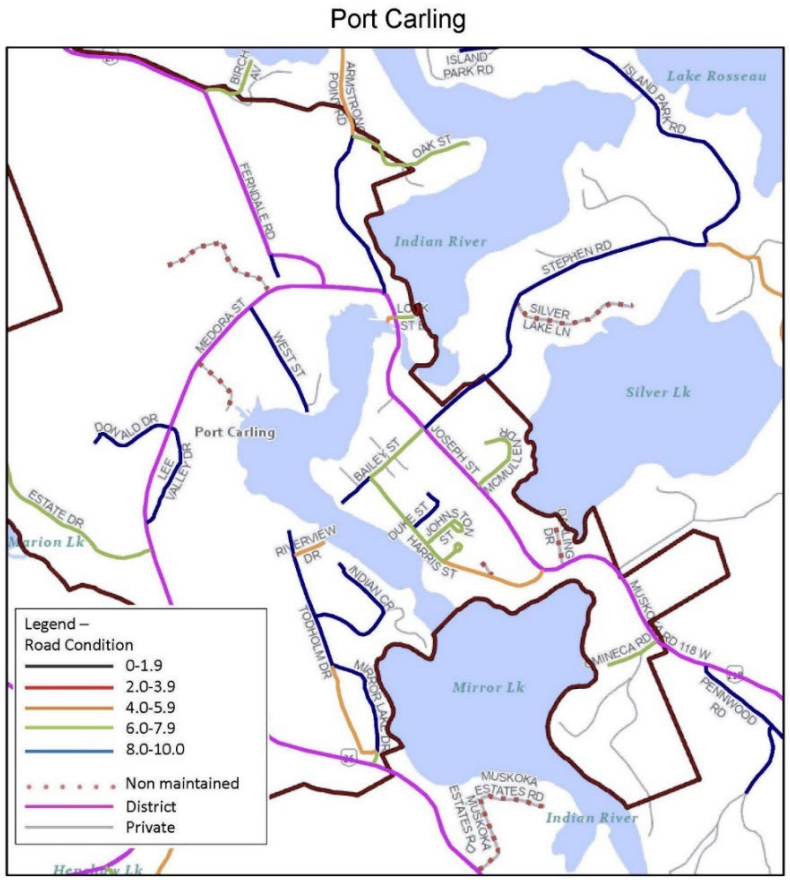


Figure 21 Torrance

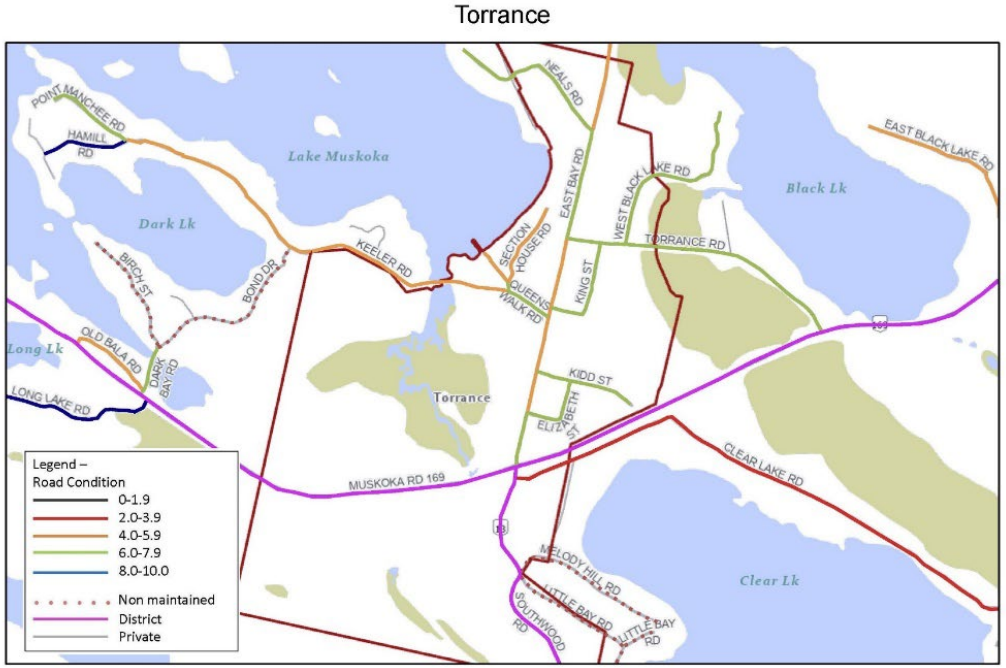


Figure 22 Windermere

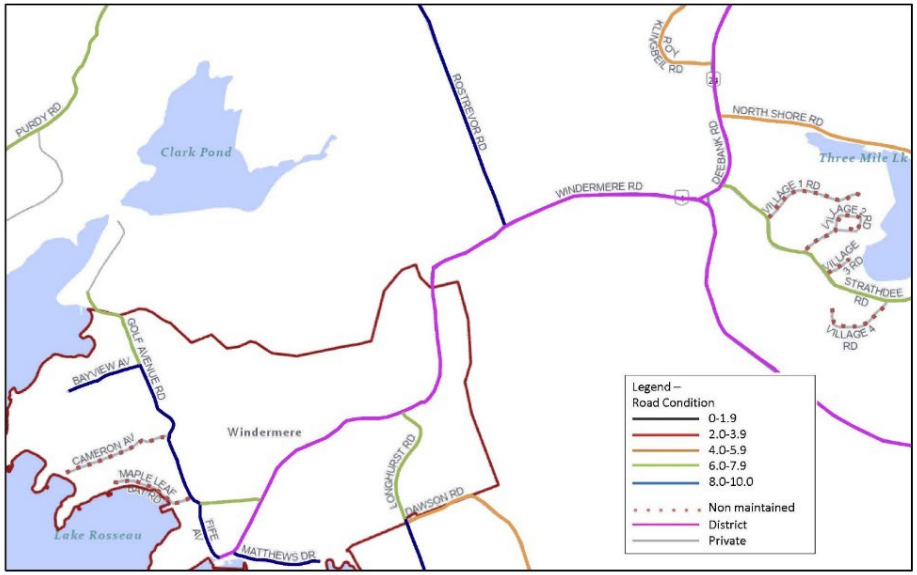


Figure 23 shows the current value of roads according to its current condition state. Current Township practice is to construct the asset, allow it to deteriorate to the point of unacceptability and then plan to replace it. This is the most expensive approach to management of the asset and results in poor service to the public for upwards to half of the time that it remains in service. This approach has resulted in a current backlog of needs in excess of $22.5 M. The dashed line in the figure represents the recommended minimum level of service according to OGRA. Adoption of this standard would increase the needs from $22.5M to $30. As stated previously, these figures do not include any new infrastructure that may stem from the adoption of the Township Official Plan or the Transportation Master Plan which are scheduled for adoption late in 2022 or early in 2023.

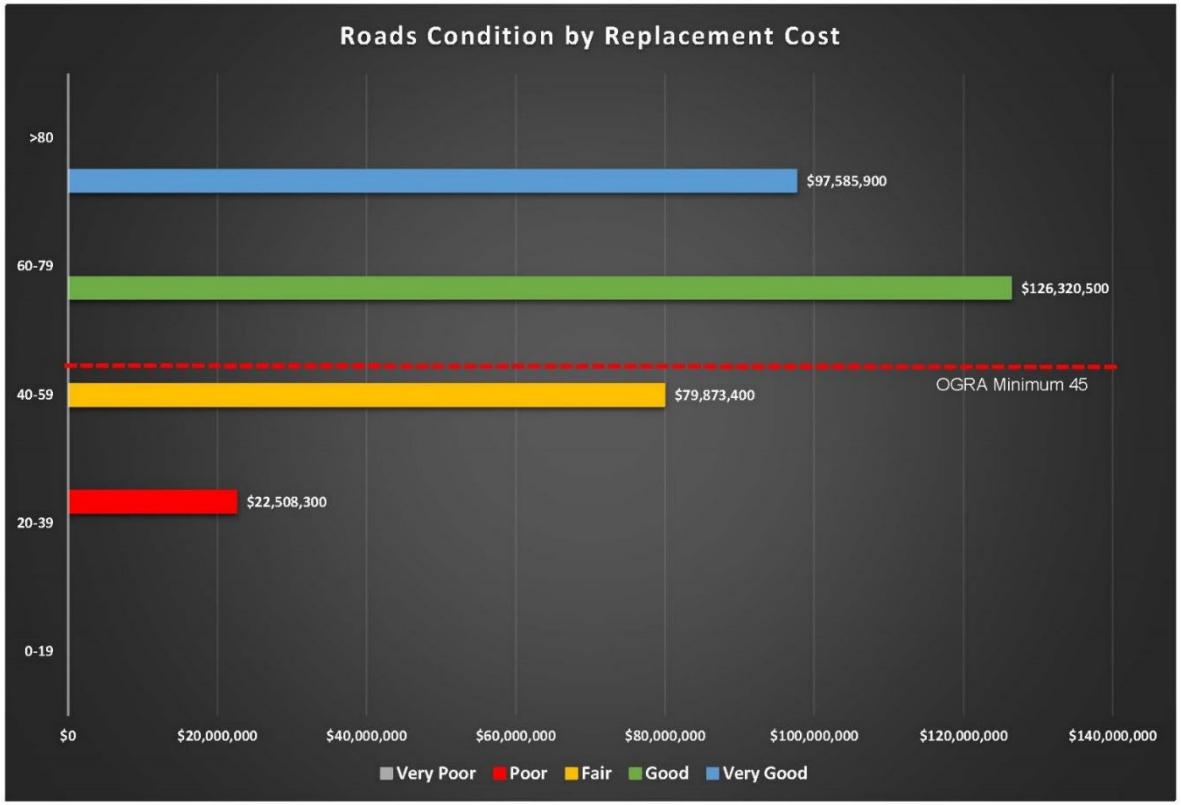


Figure 23. Road Condition Rating by Replacement Value

The maturity of the asset management practices for roads assets is less well developed than is the case for the bridges and culverts. The traditional approach of managing strictly based on condition and adopting a worst first approach to reconstruction as a means to achieving compliance with minimum requirements is not delivering value to the residents. Council should adopt a multi layered levels of service approach for the roadway system, based upon regulatory, condition, pavement quality and resident satisfaction performance measures. As was the case for the bridge and culverts, there are two major opportunities for improvement:

- many of the performance measures lack defined targets and establishing targets will provide a clearer measure of whether roadway assets are performing adequately.

- there is a data management challenge with reporting on regulatory performance. The work is being done to meet the Ontario Minimum Maintenance Standards, but the system of tracking work orders for the thousands of minor repairs performed on the roadway system each year requires new data management processes and tools. However, improved reporting through the new CityWorks Works and Asset Management System is expected.

Historically, the Township, not unlike most other municipalities, has relied on an asset stewardship approach to asset management that places emphasis on ensuring reliability of the assets. For at least a decade, there has been a paradigm shift towards customer-centric asset management. This new philosophy, bases decisions upon the asset's ability to provide value to the customer. One of the key measures of value is the level of service that will be achieved. Levels of service need to relate to quality, quantity, reliability, responsiveness, environmental acceptability as well as cost.

Through the application of asset management principles, the Township should aim to understand the relationship between the levels of service and the cost of providing the service. This relationship can then be evaluated in consultation with the community to determine the optimum level of service they are willing to pay for. The end goal is that the Township can quantitatively evaluate and communicate the impacts of decisions on levels of service.

3.4 Stormwater Management

3.4.1 Target Condition and Function

Well-functioning Stormwater Management assets provide unobstructed flow of water from rainfall events into the storm sewer piping system and stormwater management facilities, and release that water in a controlled manner to rivers and streams, protecting the community from flooding, and the natural environment from erosion and water quality impacts.

3.4.2 Visualizing Levels of Service

Drainage systems are typically rated on a scale of 1 to 10. The rating attempts to reflect the structural condition, the hydraulic adequacy of the conveyance and the ability to convey the flow to a sufficient outlet without causing damage to the surrounding properties or the environment. To simplify the scales, it is common practice to split the results into five categories (from Very Good to Very Poor). It is appropriate to provide examples of the various condition states to assist the public to visualize what the ranges of score mean from a practical perspective.

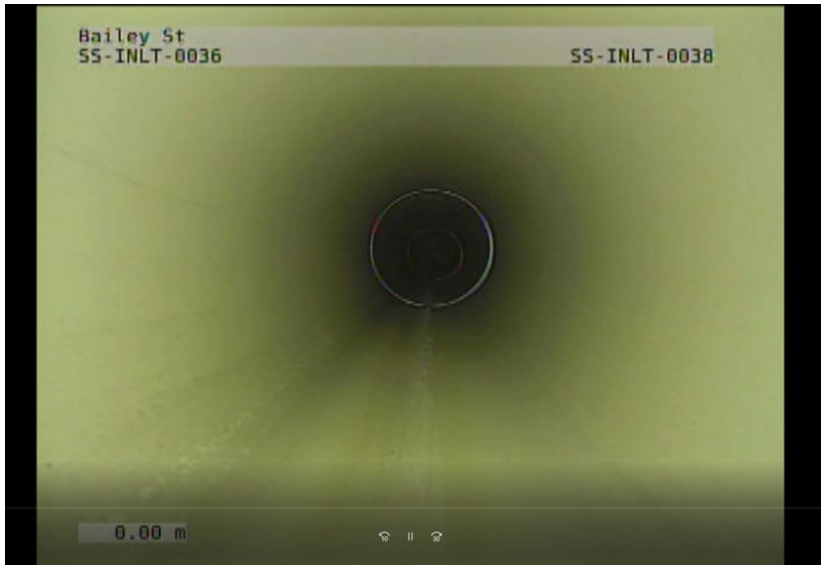


Figure 24: Good to Very Good No observed Defects (Condition Rating (CR) > 8.0)

Figure 25: Fair Condition Heavily Silted In, Fair Structural Condition with Minor Defects (CR=5.5)

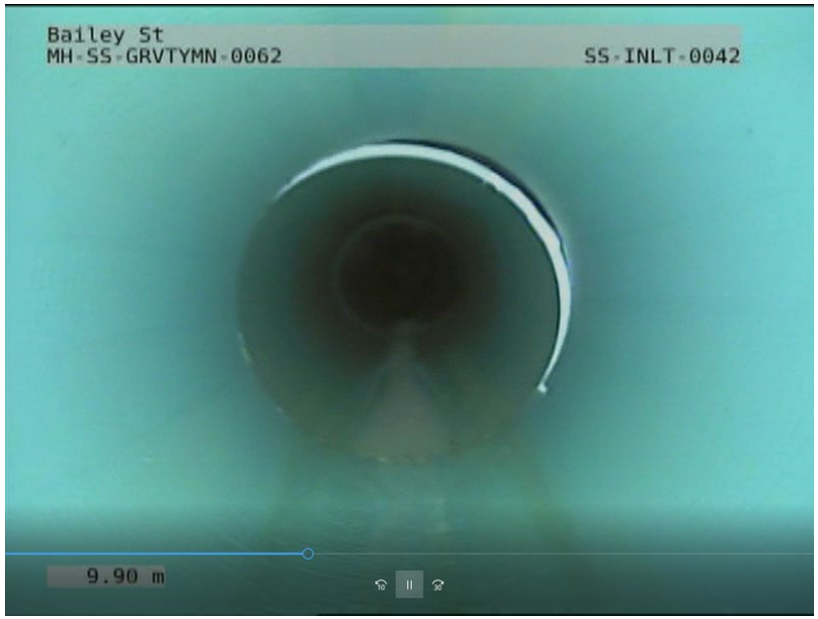


Figure 26: Poor Condition Joint Separation or Structural Failure of the Pipe, Pipe Distortion (CR=4.5)

Figure 27: Pipe Failure (CR =3.5)

Rural Drainage Systems:

Figure 28: Good Condition: Well Defined System Adequately Sized to Accommodate Design Flows (CR = 7.5)

Figure 29: Good Condition: Drainage Generally Directed Away From the Road Definition of Drainage Channels Requires Improvement (CR =6.5)

Figure 30: Poor Condition: No Defined Drainage System and Failure of the Drainage Infrastructure (CR =3.5)

Figure 31: Storm Drainage System Condition vs Age

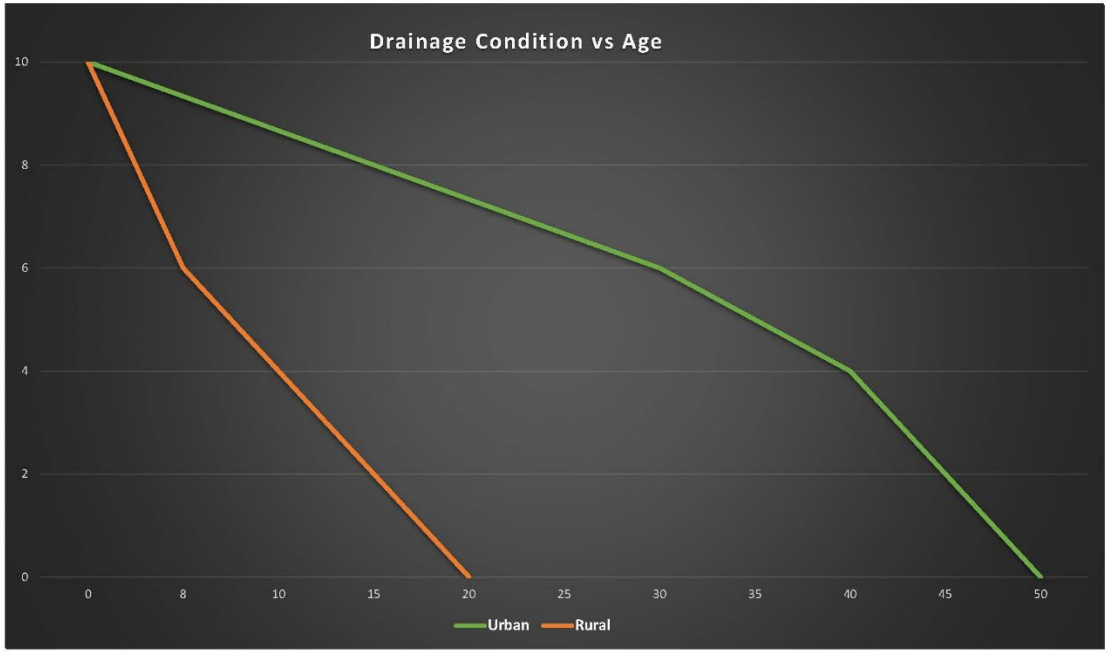


Figure 31 illustrates the actual performance of the Township's drainage systems over time based on the deterioration profile of the inventory. The data on which the chart is based is limited and will improve over time with the use of the CityWorks Works and Asset Management System. Despite its limitations, it is indicative of the state of the inventory and will be useful in the need for future works.

3.4.3 Levels of Service

Levels of service for the stormwater management asset class are a mix of regulatory requirements and performance measures to identify priorities for end of life replacement (Table 16). The Township is required to comply with conditions in the Environmental Compliance Approval (ECA) for each stormwater management facility, keeping them in good working order. The legislated requirements for stormwater management focus on the "end of pipe" quality and rate of the water discharge that flows into natural watercourses, as well as ensuring the components of the facility are in good working order and there is adequate capacity in the facility.

The condition of the stormwater network assets is considered in the Road Reconstruction Priority Rating System, monitoring and ensuring that there is adequate drainage for the roadway and that the catchbasins and drainage pipes are in good repair. Similarly, the Stormwater Management Facility Prioritization system defines criteria for rehabilitation and replacement of the stormwater management facilities based upon condition and risk. Both the Road Reconstruction Priority Rating System and the Stormwater Management Facility Prioritization System identify priorities for the 10 year capital investment plan, based on the prioritization scores from these systems.

Table 16 Stormwater Management Levels of Service and Community Satisfaction Measures

Asset	Performance Measure	Measure Type	Target	Results (2012-2016)
Stormwater Network	Road Reconstruction Priority Rating System	Asset Condition	No target defined	Priority projects incorporated into ten year capital forecast
Stormwater Management Facility	Environmental Compliance Approval (ECA) requirements	Regulatory	Meet or exceed the conditions in the Environmental Compliance Approval (ECA) requirements for each facility	Reportable on a case by case basis
	Stormwater Management Facility Prioritization System	Asset Condition	No target defined	Priority projects incorporated into ten year capital forecast

3.4.4 External Trends and Issues

There is strong coordination and integration between the stormwater asset management strategies and the management of the roadway system assets as much of the stormwater network provides drainage from the road surface and is located under or adjacent to the road bed. The major risk to maintaining levels of service for stormwater assets is the changing weather conditions associated with climate change. These changing conditions have the potential to render stormwater assets ineffective to handle storms long before these assets reach their end of life. Stormwater management continues to evolve rapidly and levels of service need to take into consideration new stormwater treatment technologies as well as source and conveyance controls.

3.4.5 Key Findings

Of the core infrastructure levels of service for the stormwater assets is the least well developed within the Township, or throughout the industry as a whole. The past practice has been to construct the assets and then respond to failures. There has been a lack of regard for assets in this class. Figure 32 provides the breakdown in the value of the asset in each condition state. Although the assessment is based on the best available information, it should be considered suspect. Further data collection is required to improve the reliability of the analysis. Nonetheless, based on the current approach to asset management, the backlog of needs is approximately $1.6 M. Adoption of a more rigorous standard such as an extension of the OGRA recommendations would increase the value of the backlog to in excess of $4.1 M.

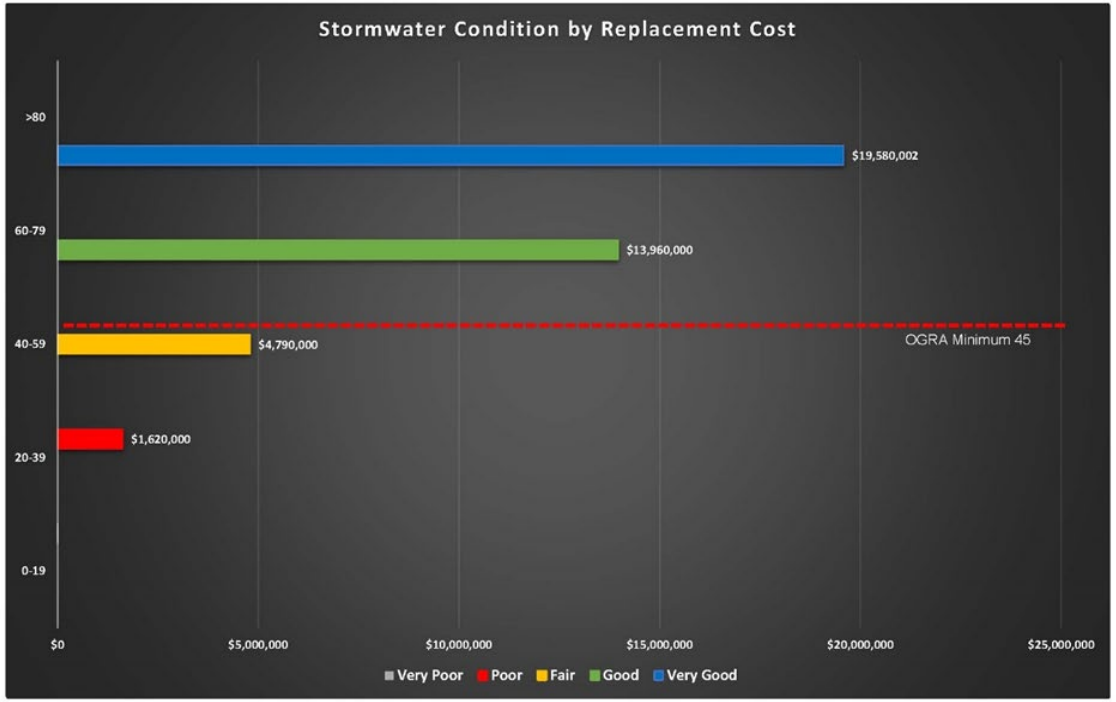


Figure 32 Stormwater Condition Rating by Replacement Value

The current focus of the levels of service for Stormwater Management assets is on complying with regulatory requirements and on identifying priorities for end of life replacement. There is an opportunity to implement a level of service for underground stormwater pipes aligned with the scheduled camera inspection program to assess condition of these assets every five years.

Climate change is the single biggest risk to maintaining levels of service for this asset class, and the Township should work with other agencies involved in stormwater management to plan for mitigation and adaptation strategies.

3.5 Regulatory Requirements and Agreements

While not specifically levels of service, regulatory requirements often dictate levels of service provided, and therefore must be considered. Overall, the Township aims to meet all regulatory requirements. Below is a summary of some of the key regulatory requirements and documented agreements for each of the asset categories. The 2017 level of service initiative will evaluate the specific level of service criteria and performance indicators related to meeting the levels of service.

Some regulations have influence over the entire asset portfolio, whereas others are more specific to a particular area. General regulatory requirements that are applicable to the entire portfolio are as follows:

- O. Reg 424/97 : Commercial motor Vehicle Operators Information (under the Highway Traffic Act,
- R.S.O. 1990)
- MOECC Reg 347: General – Waste management (hazardous material transport)
- Ontario Building Code
- National Fire Code
- Ontario Fire Code (Ontario Regulation 67/87)
- National Building Code
- Ministry of Labour – Occupational Health & Safety Act
- Accessibility for Ontarians with Disabilities Act (AODA)
- Municipal Act, 2001, S.O. 2001, c. 25
- Environmental Assessment Act, R.S.O. 1990, c. E.18
- Environmental Protection Act, R.S.O. 1990, c. E.19

Some of the key regulatory requirements that heavily influence a particular asset system are summarized in **Table 17** below. The table also includes documented agreements and strategies that dictate levels of service. In 2023, as part of the level of service framework development, the Township will document the specific level of service criteria, and related customer level of service statements.

Table 17. Applicable Regulations and Documented Service Agreements

Asset System	Regulatory Requirements	Documented Agreements / Requirements
Bridges and Culverts	▪ O. Reg. 104/97: STANDARDS FOR BRIDGES ▪ Public Transportation and Highway Improvement Act, R.S.O. 1990, c. P.50	▪ Bridge Needs OSIM Inspections
Roads and Ancillary Items	▪ Municipal Act, 2001, Ontario Regulation 239/02 Minimum Maintenance Standards for Municipal Highways ▪ Highway Traffic Act, R.S.O. 1990, c. H.8	▪ Roads Needs Condition Inspections ▪ Transportation Master Plan
Stormwater	▪ Ontario Water Resources Act, R.S.O. 1990, c. O.40	▪ Muskoka River Watershed Management Plan

3.6 Levels of Service Framework

A Level of Service Framework formally documents the expectations and approach for the maintenance and upkeep of the Township's assets. The framework is typically the product of a core services review and should be used to inform the final version of the AMP in 2024.

The project should commence with identification and documentation of current performance and the practices and procedures in place to achieve the current level of service. The second phase of the review should focus on establishing targets and engaging a broad group of stakeholders, both internal and external, in the conversation around levels of service within the Township. The work is intended to be a living process that will undergo reviews and regular updates to ensure that these vital documents remain current and applicable, and reflect the changing needs of the community.

The project should consist of the following tasks:

1. Service Inventory Review/Update: A background review of the asset data and operating and capital budgets to identify the services provided by the Township.
2. Best Practice Review of LOS Frameworks: LOS frameworks from different municipalities around the globe were reviewed to provide perspective on LOS approaches that have already been established and ensure that the Township of Muskoka Lakes' LOS Frameworks will align with international practices.
3. Development of Public Engagement Strategy: A public engagement strategy was developed to consult the public on their infrastructure priorities and values so they can be used as part of the process to develop capital and operational expenditure plans.

4. Service Level Agreements: Service level agreements define the services that will be provided to the customer and establish the relationship between the service provider and customer.
5. Key Service Attributes: The LOS frameworks include key service attributes, which are phrases that describe the service that will be provided.
6. Level of Service Statements: The LOS frameworks include LOS statements, which are short sentences that describe the outputs of the service that align with the key service attributes. Some key service attributes may have more than one LOS statement.
7. Performance Measures: Customer and technical performance measures were developed and are SMART (specific, measurable, achievable, relevant, and time-bound).
8. Risk Assessment: Risk assessments for all services identified in the service inventory review were completed.
9. 10 Year Roadmap: A 10-year implementation plan was developed with recommendations on how to update and improve existing levels of service information.
    a. During the second phase of the project, the Township will develop targets for each of the service areas for identified metrics found in the Levels of Service Frameworks. This will be achieved by engaging both internal and external stakeholders in a dialogue around the desired level of service, considering both the cost of the level of service and the desired output.

SECTION 4: ASSET MANAGEMENT STRATEGIES

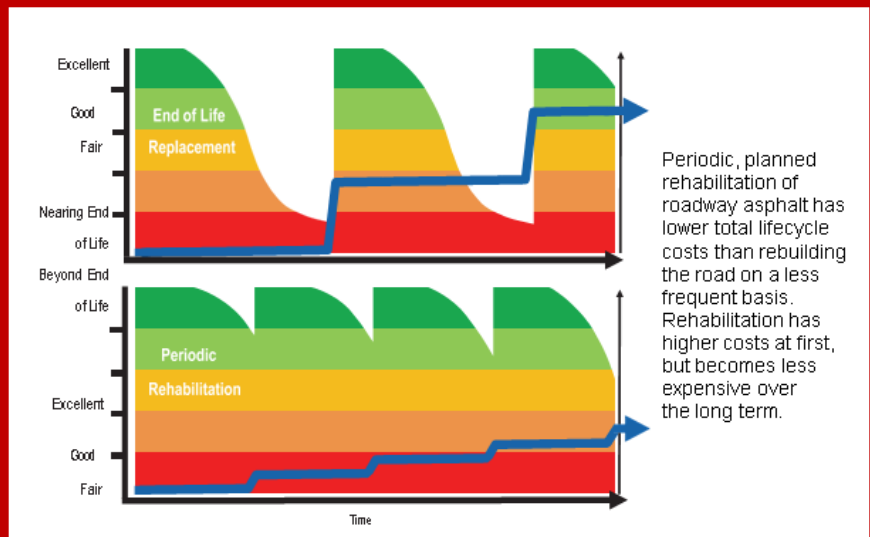
4 Asset Management Strategies

The development of asset management strategies continues the Township's asset management story, building on Sections 2 (State of Local Infrastructure) and 3 (Levels of Service). Asset management strategies are the planned actions that Township will use to manage its infrastructure to meet defined levels of service, actions like washing of bridges, sealing and asphalt patching in roads, regular inspections of stormwater management facilities. When combined together there are thousands of different scheduled inspections, maintenance actions and repair responses that occur every year to ensure that Township's infrastructure performs reliably.

4.1. Asset Management Strategies

An asset management strategy is the set of planned actions that will enable the assets to provide the desired levels of service in a sustainable way, while managing risk, at the lowest lifecycle cost. The asset management strategy is the set of actions that, taken together, has the lowest total cost – not the set of actions that each has the lowest cost individually.

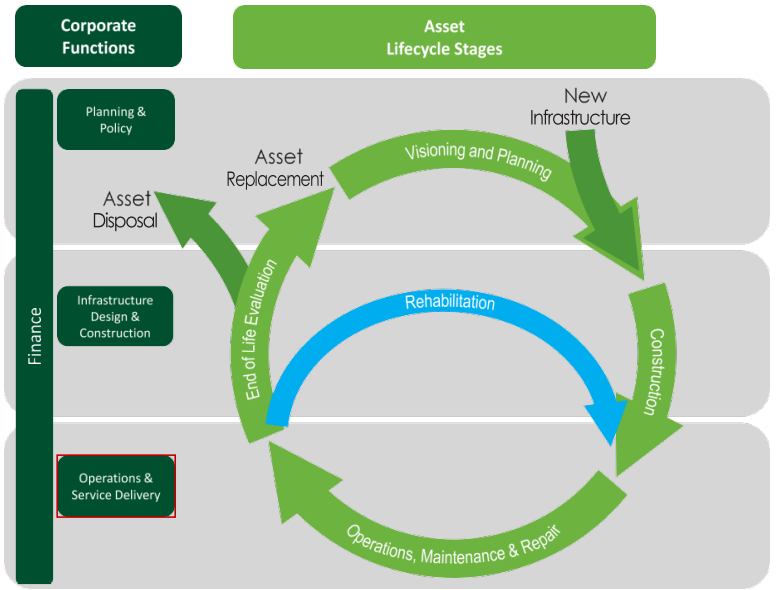
Figure 33: Total Lifecycle Costs Example



These actions help to maintain our infrastructure so they do not fail prematurely, but continue to perform well throughout their expected life. The Asset Management Strategy chapter tells us what actions we need to take and when we need to take them.

All infrastructure assets go through a series of stages called a lifecycle. Asset management strategies need to consider each stage of the asset lifecycle when determining how to best manage that asset. In particular, sound asset management strategies consider the overall cumulative lifecycle cost when determining what actions to take to manage that asset.

Figure 34: Asset Lifecycle Stages



For example, it does not make long term sense to purchase an asset cheaply if the extra operation and maintenance requirements of that asset, or its shortened life expectancy, will cost more than purchasing a more durable or reliable asset. It is also not effective to continue to maintain and repair an asset when it would be less costly to replace the asset. Determining the optimum set of management strategies requires the analysis of a number of options and the risks associated with each one. This is particularly relevant when it comes to making a decision to replace an asset.

4.2. Planned Actions: Infrastructure Management Strategies

The types of planned actions that the Township uses to manage its infrastructure assets to deliver consistent and reliable service throughout their expected life are dependent on the lifecycle stage of the asset. For example, some planned actions are relevant when considering the acquisition or purchase of an asset while others should be considered when deciding whether to continue to repair or rehabilitate the asset. Planned actions can include inspections and repairs as well as non-infrastructure strategies like growth planning, coordination, data management and procurement. Each stage of the asset's life presents different asset management opportunities to achieve the lowest cost outcomes for the Township's assets. Descriptions of the major lifecycle stages and some opportunities to maintain level of service while lowering total lifecycle cost for each stage are listed below.

4.2.1. Asset Acquisition

Many of the Township's assets like roads and bridges belonged to the former municipalities prior to when the Township of Muskoka Lakes was formed. These municipal infrastructure assets were added to as land in the Township was developed or redeveloped by the private sector. Where this is the case, ownership of an asset is transferred to the municipality after construction. The standards and specifications for public infrastructure were not established until relatively recently. As a consequence, the Township has some infrastructure with deficiencies which must be resolved when reconstruction occurs. This represents a considerable liability to the municipality. The adoption of standards and specifications are key non- infrastructure solutions for the municipality to manage the future reconstruction and expansion of its infrastructure.

4.2.2. Non-Infrastructure Solutions

These are actions or policies that can lower costs or extend asset life such as better integrated infrastructure planning and land use planning, demand management, insurance, process optimization, managed failures, etc. Muskoka Lakes should incorporate non-infrastructure solutions into its asset management strategies using the following:

- Strategic Plans and Land-Use Planning (eg. Strategic Plan, Official Plan)
- Standards and Specifications for new infrastructure
- Procurement By-law, Policies and Procedures
- Coordination of multiple asset replacements at the same time
- Coordination with other levels of government

The majority of the Township's procurement activities are undertaken competitively to ensure the lowest cost bidder that meets the specifications and standards is awarded the contract. Efforts to strengthen the consideration and application of total lifecycle cost as a criteria in the procurement process need to remain a priority. Regardless of how an asset is acquired there is an opportunity to include up to date information on new assets into the asset database at the time of acquisition to improve data confidence for future decisions. A major question to be considered during the asset acquisition stage is whether designing to a higher standard or purchasing a different type of asset can result in lower costs later in its lifecycle.

4.2.3. Operations & Maintenance

A key asset management strategy is inspection, assessment and preventative maintenance of the assets to prevent potential problems before a failure occurs or before more significant maintenance would be required. This includes a range of routine planned actions such as street sweeping, calcium stabilization, catchbasin cleaning, flushing of sewers and quarterly and annual equipment servicing. Major questions to be considered during the operations and maintenance stage are whether the asset can be operated in a way that reduces day to day costs or whether additional inspection, assessment and maintenance before failures occur could reduce costs and minimize service interruptions.

4.2.4. Repair

The repair of damaged infrastructure is a key asset management strategy when Operations & Maintenance is not sufficient to maintain assets in acceptable condition or when damage is unexpected. This includes a wide spectrum of actions ranging from concrete repairs to a bridge deck or sidewalk to repairing potholes. Major questions to be considered during the repair stage are whether repairs can be avoided without affecting the level of service, whether they can be performed at a lower cost through a different service delivery mechanism, or whether they should be used to extend the life of the asset that is nearing the end of its life expectancy.

4.2.5. Rehabilitation

Some infrastructure assets can be restored to near-new condition and have their expected life extended through planned rehabilitation actions if the actions are implemented in a timely fashion. In many instances this may be more cost effective than allowing assets to reach their end of life. It also results in a higher level of service and higher levels of resident satisfaction. This approach has not traditionally been followed by the Township. A condition assessment analysis often provides the detailed information needed to determine the scope of the rehabilitation. Examples of rehabilitation of Township's assets are sealing of road surface or sewer re-lining where a smaller diameter pipe is inserted into the existing sewer or an asphalt overlay program where several kilometers of roads are milled and/or resurfaced each year. Major questions when considering rehabilitation are whether it would be more economical to continue to repair the asset even as the frequency of repairs increase, whether rehabilitation is required to restore level of service, or whether enough interconnected components of the infrastructure are degraded to the point where it makes no sense to rehabilitate part of the infrastructure.

4.2.6. Replacement

There comes a time in the lifecycle of most infrastructure assets when the most cost-effective strategy is to replace the asset. This may be when it is no longer makes sense to repair or rehabilitate the asset, such as when a road is in poor condition and its underlying sewer/drainage system is experiencing frequent failures. It may also be due to the asset no longer meeting the need of a community such as a single lane bridge where the traffic has grown to the point that the width needs to be increased to accommodate two lanes. Some of the key questions at the replacement stage are whether the original design or the service level associated with the asset needs to be re-evaluated, and whether coordinating multiple asset replacements can reduce total costs.

4.2.7. Disposal & Decommissioning

Some assets result in a substantial liability at their end of life which may include demolition costs and land restoration, and more rarely includes land contamination remediation and disposal of hazardous waste. Disposal and decommissioning costs should be included in the total lifecycle costs and asset management practices for municipal assets. A key question at this stage is how the financial, environmental and social costs can be minimized during the disposal of an asset. This is becoming an issue of increasing importance especially as it relates to some of our buildings. The Township should do a periodic assessment of risks associated with

decommissioning and disposal of assets. At this time, no assets have been identified that require special disposal or decommissioning consideration although this is expected to change.

4.3. Options Analysis

The goal of asset management strategies is to achieve the lowest total lifecycle cost for the assets while maintaining the level of service for that asset. Given the range of potential options at any stage in the lifecycle of an asset, achieving this goal requires a defined process to evaluate the potential options and determine the best decision to make. The Township should have options analysis processes focused on different stages in the lifecycle including acquisition, operations, maintenance & repairs, rehabilitation and replacement. Each of these are discussed below.

4.3.1. Asset Acquisition

Muskoka Lakes has a comprehensive process to plan for the future growth of the Township. The Township is guided by a number of planning documents including the Strategic Plan (2020), Official Plan (2010, as amended, currently being updated), Parks and Recreation Master Plan (2022), Fire Master Plan (2022) and a Transportation Master Plan (to be initiated in 2022 and completed in 2023). Each of these documents is/should be developed through the lens of setting a vision for the municipality and roadmap to deliver on that vision keeping in mind the options available and risk mitigation to best serve the residents of the Township currently and into the future. The expansion of services to new areas or extension of existing services to meet future demands is coordinated through a minimum 10 year capital forecast, balancing funding allocations amongst the growth needs of all of the strategic plans, and between funding these growth projects and funding rehabilitation and replacement of existing assets. There is an opportunity to review and improve the asset acquisition standards and policies to reduce total lifecycle costs.

4.3.2. Operations, Maintenance & Repairs

Options for optimizing operating maintenance occur every budget cycle and should be the focus of internal reviews, such as an Operations Core Services Review. There are opportunities to develop more options analysis at the operations, maintenance and repairs stages of the lifecycle. Options analysis during the operations phase of asset lifecycles will be a future focus in the ongoing development of the CityWorks work and asset management program.

4.3.3. Rehabilitation

Infrastructure assets which are candidates for rehabilitation require a business case to be prepared and should be supported by detailed condition assessment reports. There are a number of triggers for rehabilitation depending upon the asset class. For example, Roads have a Pavement Condition or Quality Index that triggers rehabilitation activities which combines asset condition information with age information to create a list of assets that are candidates for rehabilitation. There are additional systems that can identify candidate assets for rehabilitation for bridges and culverts and stormwater management facilities. Incorporated into the business case template should be the requirement to evaluate alternatives to improve service and decrease cost. As the asset

management plan and processes mature there is an opportunity to focus more on rehabilitation activities, which often result in lower total asset lifecycle costs, instead of the current focus on asset replacement.

4.3.4. Replacement

In Muskoka Lakes, like most municipalities, prioritization is set based on the worst first approach. Some of the major asset classes have guiding measures to aid in the identification of the highest priorities for replacement. These guiding indicators are based on traditional approaches prescribed by the Province of Ontario when it took a more active role in municipal management. Prioritization systems should be more broadly based and include criteria to evaluate the level of risk the asset presents, based on condition, function, opportunities, benefits and costs so informed decisions can be made. They should also consider the opportunities for coordinated or integrated action on different asset classes, such as the roadway system with its underground water, wastewater and stormwater assets, to avoid impacts and unnecessary costs.

4.3.5. Asset Replacement Priority Rating Systems

For each asset class, different considerations are weighted differently when prioritizing major asset rehabilitation and replacement work, balancing technical analysis, risk and community expectations.

In addition to the project prioritization rating systems, each capital project proposal should include a business case that assesses the risks and advantages of the proposed project implementation options. Each capital business case should address:

- Historical statistics supporting the need for the capital project Identify any risk to the community or the corporation;
- How the completion of this project will service the current and future needs of the community;
- How the risks with the current strategy will be reduced though the completion of this project Qualitative (non-financial) impacts of completing the capital project;
- How it is in support of the overall objectives of the Township or Department. How other municipalities or related organizations are performing this function;
- The comparative advantages and disadvantages of each alternative implementation, demonstrating that staff have exercised due diligence in arriving at the recommended project;
- Overall capital costs, and provide an estimate on the operational costs of the capital asset's first year of operations and the first full year of operations. Where possible, include a forecast provision for capital impacts as a result of ongoing studies, master plans, recommendations, and development charge updates, etc.; and
- Other possible funding opportunities besides Reserves, Development Charge or tax rate including: third party funding recovery, partnership opportunities and Federal Gas Tax

A description of the specific options analysis processes associated with each asset class can be found in sections 4.3 to 4.5.

4.4. Bridges

4.4.1. Asset Management Strategies

Table 18

Bridges and Culverts Life Cycle Actions	
Life Cycle Stage	Actions
Monitoring	Monthly inspection (Road Patrol) Visual inspections twice per year Visual inspections after storm events
Condition Assessment	OSIM standard, every 2 years
Operations & Maintenance	Debris removal Deck drain and bearing seat flushing (power wash) Expansion joint cleaning
Repairs	Concrete repair Handrail repair Guiderail Repair Sign repair/ replacement
Rehabilitation	Capital business case
End of Life	Capital business case

OSIM– Ontario Structure Inspection Manual

The bridges and structural culverts within the Townships roadway system are very high concentrations of public investment that are well used and highly visible community infrastructure assets. The lifecycles of the various components are well understood. The bridge surface and above grade components have the most extensive asset management strategies and a range of planned actions for each of the stages of the bridge's lifecycle (Table 18). These actions are largely driven by the Ontario Minimum Maintenance Standards.

At the early stages of a bridge lifecycle, regular inspection and routine maintenance such as sweeping cleaning and debris removal are sufficient to keep the asset at its target condition. When the bridge is in good or very good condition, is also the time to begin to take preventative action on small deficiencies that may become bigger later on, such as crack sealing and concrete patching.

At the mid stages of the lifecycle, when bridges and culverts are still good to fair condition, more repairs are necessary to keep it at its target condition. There may be a need to undertake more significant repairs around expansion joints, end blocks, barriers, etc. and there will likely be a need for more localized patching and even the resurfacing of some larger sections in order to fix surface

Eventually, as the structure moves from fair to towards poor, the frequency and size of these types of repairs increase to the point where it is time to evaluate whether it would be more cost- effective to undertake rehabilitation of the structure. At this point in the lifecycle, many of the longer lived components will still be in good condition making the costly reconstruction of the entire bridge and approaches unnecessary. A condition assessment such as a deck condition survey is a good way to identify candidates for rehabilitation. There are a wide range of strategies available for rehabilitating different types of structures. For example, a patch, overlay or patch waterproof and pave are strategies that can be employed cost effectively depending on the extent of the deterioration. Patching or encapsulation or fibre reinforcement are strategies that can be used to address damaged or weakened concrete components. Regardless of the option selected the objective of the rehabilitation is to move the condition of the structure into the very good condition again, requiring minimal maintenance on a go forward basis for the foreseeable future.

A bridge may be rehabilitated two or perhaps three times before it is necessary to replace it. In the later stages of the life of the structure the decision to replace the structure should be based on a business case assessing the cost to further repair or rehabilitate the structure and the likely extension of life compared to the cost to replace the structure and its corresponding life span. The assessment should occur approximately ten years in advance of the likely replacement date and updated again five years before replacement.

At the asset replacement stage, it is important to re-evaluate whether the structure in its original configuration is sufficient to meet current standards and future conditions. The redesign of the structure and associated approached should take direction from key documents such as the Official Plan, the Transportation Master Plan, and any other applicable planning and engineering studies.

4.4.2. Options Analysis and Project Prioritization

The Township has a wide range of asset management strategies available to it however, in order to be effective, the right strategies need to be applied at the right times.

Monitoring, Operations & Maintenance and Repair decisions are not currently tracked. This short coming will be corrected through the implementation of the CityWorks Work and Asset Management System. There is an opportunity to improve decision making by comparing the cost-effectiveness of various strategies applied at different frequencies to find the best combination. For example, would it be better to conduct more frequent concrete sealing to reduce the need for spalling and surface rehabilitation later on. Changing how assets are maintained may result in requests through the budget process for more resources to undertake preventative maintenance in order to extend the lifecycle and eventual replacement of the asset, reducing the capital repair and replacement costs.

The need for rehabilitation is identified by condition assessment results and triggers creation of a business case which includes the evaluation of alternatives. There is an opportunity to strengthen the evaluation of alternatives to include the implications of the proposed rehabilitation actions on the entire lifecycle.

The use of the Bridge Sufficiency Index (BSI) is a good approach to prioritizing bridge projects as it includes criteria for condition, function and risk and integrates with other asset classes which are linked to and affected by changes to the bridge.

The most significant opportunity to improve Options Analysis for the bridge system is to link the decisions made at the initial construction of an asset with those made during operations, maintenance, repair, rehabilitation and end of life to see how each decision affects the longevity and lifecycle cost of the asset. To take advantage of this opportunity it is essential that the commitment to the development and use of the CityWorks Asset Management System remain.

4.4.3. Key Findings

There is a wide range of asset management strategies in place for most components of Township's system of bridges and culverts. The management of the bridge deck surface is a good example of the use of planned actions at different stages of an asset's lifecycle to cost effectively manage the asset. Decisions to apply asset management strategies should be made through the Work and Asset Management System to operate, maintain and repair the asset, through condition assessment and business cases at the rehabilitation stage and through an integrated priority rating system at end of life. There is an opportunity to strengthen the options analysis at each stage as well as link the decisions across the stages to see how they affect the overall longevity and lifecycle cost of the asset.

4.5. Roads and Ancillary Items

4.5.1. Asset Management Strategies

The roadway system is a well-used and most highly visible community infrastructure asset in the Township's asset inventory. The life cycles of the various components are reasonably well understood. Similarly the road bed and road surface have the most extensive and generally accepted range of asset management strategies, having a range of planned actions for each of the stages of the road's lifecycle (Table 19). These actions are largely driven by the Ontario Minimum Maintenance Standards. The Township has not traditionally followed these actions.

Table 19

Roads and Ancillary Items Life Cycle Actions					
Life Cycle Stage	Road Bed	Road Surface	Sidewalks	Streetlights	Signage
Monitoring	Monthly inspection (Road Patrol)	Monthly inspection (Road Patrol)	Monthly inspection (Road Patrol)	Monthly inspection (Road Patrol) Online public reporting	Monthly inspection Annual inspection
Condition Assessment	Roads condition assessment every two to four years (concurrent with road surface) SAR used to rate condition	Roads condition assessment every two to four years. PCI used to rate condition	Annual Sidewalk condition assessment. SCI used to rate condition	Condition assessment every five years.	Reflectometer Survey Biennially
Operations & Maintenance	Shoulder grading Debris removal Ditching Crack sealing Asphalt patching	Sweeping Debris removal Asphalt patching Grading Calcium stabilization Crack sealing Slurry seal Line and marking repainting Winter maintenance	Sweeping Crack sealing	Annual monitoring Annual maintenance	Annual test Annual maintenance
Repairs	Localized base repairs Localized drainage improvements Asphalt hot patch Asphalt cold patch Grading Dust control Granular patch	Shouldering Curb repair Regrade and re-seed Boulevard restoration Guide rail repair or replace Fence repair or replace Asphalt hot patch Asphalt cold patch Grading Dust control Granular patch	Concrete grinding Asphalt cold patch Asphalt hot patch Mud jacking Interlocking base repair/ reinstall	Luminaire replacement Pole repair Pole replacement Electrical supply repair	Component repair if damaged/ vandalized Component replacement if beyond repair
Rehabilitation	Capital business case	Shave and pave Full overlay Infrared seal Micro-seal	Sidewalk bay replacement Asphalt full overlay	Capital business case	

End of Life	Road Reconstruction Priority Rating System identifies priority projects to include in the Ten Year Capital Forecast	Road Reconstruction Priority Rating System identifies priority projects to include in the Ten Year Capital Forecast	Sidewalk Priority Rating System or Road Reconstruction Priority Rating System identifies priority projects to include in the Ten Year Capital Forecast	Assessed when roads projects are added to the Ten Year Capital Forecast	Assessed when roads projects are added to the Ten Year Capital Forecast

Signs and streetlights should have regular inspection and maintenance programs, but there are fewer options to correct or rehabilitate malfunctioning components. Usually malfunctioning or substandard components are replaced which restores their function and end of life replacement occurs when a road is being reconstructed or when a decision is made to replace the whole system such as with the current LED light conversion project.

The management of the Township's pavement quality provides a good example of how different asset management strategies can help to achieve the lowest lifecycle cost of an asset. At the early stages of a roadway lifecycle, regular inspection and routine maintenance such as sweeping and debris removal are sufficient to keep the Township's roads at their target condition. The early stages, when the roads are in good or very good condition, are also the time to begin to take preventative action on small deficiencies that may become bigger later on, such as crack sealing, slurry sealing and single surface treatment.

At the middle stages of the lifecycle, when road conditions are in the fair to good range, more repairs are necessary to keep the road at its target condition. There may be a need to undertake more significant repairs around culverts, catchbasin and manhole covers, etc. and there will likely be a need for more localized patching and even the resurfacing of some larger sections to fix surface roughness and protect the underlying road bed.

As the road surface condition moves from fair to poor, the frequency and size of these types of repairs will increase to the point where it is time to evaluate whether it would be more cost- effective to undertake rehabilitation of the surface of the road. At this point in the lifecycle, many of the longer lived road components will still be in good condition making the costly reconstruction of the entire roadway unnecessary. A condition assessment such as the pavement management assessment that the Township is now undertaking on its roads every two years is a good way to identify candidates for rehabilitation. The Township has a range of strategies available for rehabilitating different classes of roads. For example, micro seal asphalt rehabilitation is a strategy that may be suited for roads that service industrial areas, whereas a shave and pave or full overlay may be better suited to residential areas. After rehabilitation of the road surface the condition of the road will move back into the very good condition again, with minimal maintenance requirements.

A road surface may be rehabilitated once or twice before it is necessary to reconstruct the entire road but at some point in time the other roadway components and the underlying infrastructure such as sewer and water pipes will also need attention. This is the time that the replacement of the entire road needs to be considered. The Township should adopt a road reconstruction priority rating system to evaluate roads that are a priority to be reconstructed. The reconstruction listing should extend out at least in the next ten years and potentially as far out as 20 or 25 years. When Council confirms that a road is to be reconstructed, the unusable portions of the old road are decommissioned and disposed of and a new road designed and built, which is the end of the lifecycle of the original road and the beginning of the next.

At the asset replacement stage, in some cases it is important to re-evaluate whether the road in its original configuration is sufficient to meet current standards and future conditions. The redesign of the road and its underlying services will take direction from key documents such as the Official Plan, Transportation Master Plan, the Community Improvement Plan, and any other local planning and engineering studies.

4.5.2. Options Analysis and Project Prioritization

Asset management strategies to ensure that an asset remains in acceptable condition must be implemented in the correct order and in a timely fashion if they are to be effective.

Monitoring, Operations & Maintenance and Repair decisions are not currently tracked. The CityWorks Work and Asset Management System is currently in the process of being deployed. There is an opportunity to improve decision making by comparing the cost-effectiveness of various strategies applied at different frequencies to find the best combination. For example, would it be better to conduct more frequent crack sealing to reduce the need for pothole patching and surface rehabilitation later on. Changing how assets are maintained may result in requests through the budget for more resources to undertake preventative maintenance in order to extend the lifecycle and eventual replacement of the asset, reducing the capital repair and replacement costs.

The need for rehabilitation is identified by condition assessment results and triggers creation of a business case which includes the evaluation of alternatives. There is an opportunity to strengthen the evaluation of alternatives to include the implications of the proposed rehabilitation actions on the entire lifecycle.

End of life replacement for rural roads should be prioritized using a road reconstruction priority rating system. This rating system will form the basis for future roadway system asset replacement prioritization decisions.

The suggested approach to the road reconstruction priority rating system is strong as it includes criteria for condition, function and risk and integrates with other asset classes which are linked to and affected by changes to the roadway system. A second rating system for sidewalks, should focus on prioritizing upgrades of sidewalks and paths to increase mobility options.

The most significant opportunity to improve the options analysis for the roadway system is to link the decisions made at the initial

construction of an asset with those made during operations, maintenance, repair, rehabilitation and end of life to see how each decision affects the longevity and lifecycle cost of the asset. This will evolve over time.

4.5.3. Key Findings

There is a wide range of asset management strategies in place for most components of Township's Roadway System. The management of the roadway surface is a good example of the use of planned actions at different stages of an asset's lifecycle to cost effectively manage the asset. Decisions to apply asset management strategies should be made through the Work and Asset Management System to operate, maintain and repair the asset, through condition assessment and business cases at the rehabilitation stage and through an integrated priority rating system at end of life. There is an opportunity to strengthen the options analysis at each stage as well as link the decisions across the stages to see how they affect the overall longevity and lifecycle cost of the asset.

Recommended Road Reconstruction Priority Rating System

- Roadworks: Pavement Structure, Pavement Surface, Road Width, Maintenance Demand, Drainage (50 or 75%)
- Water and Sewer (in urban areas): Watermains, Sanitary Sewers (25%)
- Road Usage: Road Class, School/Community Centres/Parks, Sidewalks (25%)

Recommended Sidewalk Priority Rating System

- Road Function (50%)
- Traffic Characteristics (25%)
- Importance to network (25%)

4.6. Stormwater Management

4.6.1. Asset Management Strategies

The Township's Stormwater Management assets play an important but not commonly known function in protecting the environment and protecting our community. Stormwater Management assets are integrated into the other assets in the community and need to be coordinated with other asset classes. Stormwater ditches catchbasins and manholes are adjacent to or in the surface of the road and are generally maintained as part of the Roadway Surface. Culverts and stormwater pipes are located within the road structure, and stormwater outfalls and stormwater management facilities may be in or adjacent to parks and open space.

The long expected life of stormwater assets means that much of the asset lifecycle and the resulting asset management strategies are focused on operations, maintenance and repairs to maintain their function.

There are a range of asset management strategies for stormwater assets (Table 20) but they are mainly for reactive inspection, maintenance and repair actions rather than planned actions. There is an opportunity to evaluate whether there would be value in investing more in planned preventative maintenance. Camera inspection of the underground storm sewer pipes has been initiated and should be updated every five years to help determine whether there are deficiencies building up that needs to be addressed by better preventative maintenance.

Strategies for the rehabilitation of stormwater management facilities should be developed through condition assessments. Rehabilitation of components of the stormwater network are infrequent and should be initiated by a capital business case, after being detected because of failure of the asset or by detecting deficiencies through routine maintenance or the camera inspection program. End of Life replacement for both the stormwater network and the stormwater management facilities should have established rating systems. The stormwater network components should be considered as part of the road reconstruction priority rating system.

Table 20: Stormwater Life Cycle Actions

Stormwater Life Cycle Actions		
Life Cycle Stage	Stormwater Network	Stormwater Management Facilities
Monitoring	Monthly inspection of catchbasins/manholes (Road Patrol) Inspection of inlets/outlets twice annually Inspection of inlets/outlets around major rainfall events Storm manhole visual inspection Storm box culvert visual inspection Oil-grit separator visual inspection	Monthly hydrological data Inspection of inlets, outlet, water elevation twice annually Detailed annual inspection
Condition Assessment	Storm Catchbasin Leads TV Inspection Storm Lateral Line TV Inspection Storm Main Line CCTV every 5 years	Dam Safety Assessment every 5 years
Operations & Maintenance	Debris removal Sediment removal Storm main line flushing Catchbasin cleaning Oil-grit separator maintenance Oil-grit separator cleaning Storm box culvert maintenance Manhole maintenance	Debris removal Flushing

Repairs	Concrete headwall repair Grate repair Ditch excavation & regrade Culvert replacement Catchbasin frame/cover replacement Catchbasin moduloc repair Manhole frame/cover replacement Manhole moduloc repair Storm catch basin leads repair Storm lateral line blocked Storm lateral line repair Storm lateral line replace Storm main line blocked Storm main line repair Storm main line replace	Outlet maintenance Concrete repair Fence repair/replace Grate repair/replace Weir repair/replace Fill and reinforce
Rehabilitation	Capital business case	Sediment removal Capital business case
End of Life	Road Reconstruction Priority Rating System considers Stormwater Network when identifying priority projects to include in the Ten Year Capital Forecast	Stormwater Management Facility Prioritization system identifies priority projects to include in the Ten Year Capital Forecast

4.6.2. Options Analysis and Project Prioritization

The bulk of the focus for the management of Township's stormwater management assets should be on inspections and the correction of deficiencies. Minimal options analysis is being undertaken until the assets near their end of life. There is an opportunity to evaluate the current deficiencies in assets of different ages and ask whether establishing a preventative maintenance program would be cost-effective for these long lived assets.

Monitoring, Operations & Maintenance and Repair actions are not currently being tracked through the work and asset management system. There is insufficient detail for most of the subcomponents to determine what deficiencies are being addressed. Even if there is insufficient value identified in the business case for investing in more preventative maintenance, better descriptions of the types of actions being taken should be pursued so that informed operational decisions can be made.

The need for rehabilitation for Stormwater Network assets is identified through condition assessment of the assets, which may be due to the failure of the asset or detection of a deficiency through the camera inspection program. These should be outlined in a business case which includes the evaluation of alternatives. The need for rehabilitation of stormwater management facilities should be identified through condition surveys, and candidate projects are proposed to be added to the capital program.

End of Life replacement for the stormwater network assets should be prioritized as part of the road reconstruction priority rating system. A second rating system for stormwater management facilities, should focus on prioritizing upgrades to current stormwater standards. The suggested approach to use the road reconstruction priority rating system is strong as it includes criteria for condition, function and risk and integrates with other asset classes which are linked to and affected by changes to the storm network.

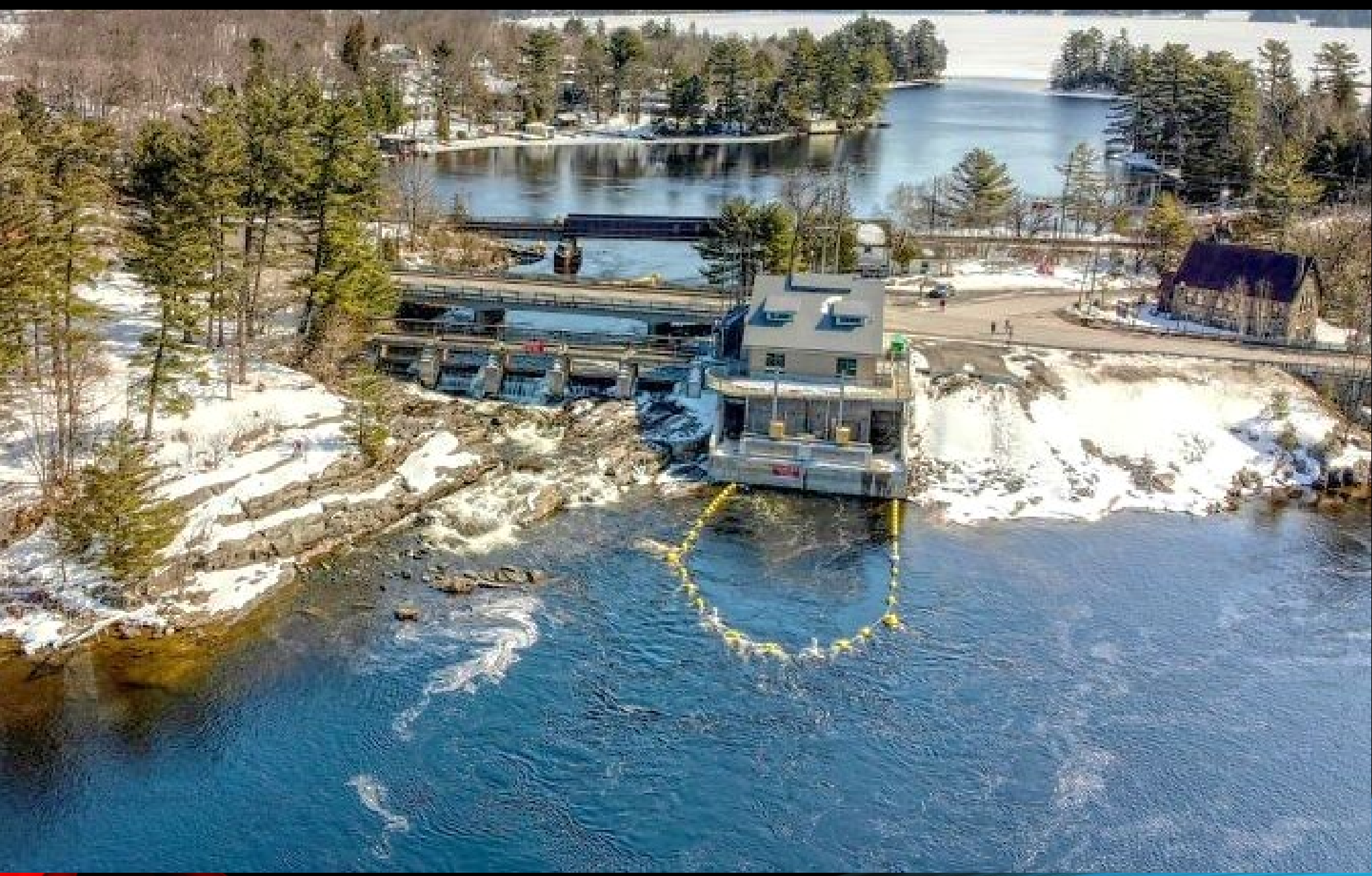
Recommended Stormwater Management Prioritization

- Flood Protection (25%)
- Statutory and Regulatory Requirements (20%)
- Risk Management / Health and Safety Issues (15%)
- Operations and Maintenance Considerations (15%)
- Cost Benefit Analysis (5%)
- Erosion control and slope stabilization (5%)
- Spills management (5%)
- Environmental issues (5%)
- Community concerns (5%)

There is a strong rationale for the inclusion of management facility projects in the ten year capital forecast. Future editions of the AMP should consider the inclusion of a program and priority rating system to address the repair and remediation of watercourses that the stormwater flows through. This should be addressed as part of a consideration of environmental assets.

4.6.3. Key Findings

The Township's stormwater assets are integrated with other asset classes. The focus for these long lived assets needs to be primarily on inspections and then responding to deficiencies. It is unclear whether more preventative maintenance would be cost-effective although this question should be investigated. There is an opportunity to track maintenance and repair actions in more detail, especially for the underground components of the stormwater network. The approach to rehabilitation and end of life replacement will have a significant impact contributing to sound lifecycle management decisions for this asset class.



SECTION 5: FINANCING STRATEGY

5 Current Financing Strategy

The Financial Strategies Section is the last chapter of the story describing the current state of asset management planning in Muskoka Lakes. It is intended to combine the state of our infrastructure, the levels of service and asset management strategies with financial planning and budgeting to ensure that there is a sustainable revenue stream to fund the long term management of the Township's assets. Each piece of the asset management plan tells us something important. The State of Local Infrastructure (Section 2) tells us the life expectancy of our core assets and their replacement cost. The Levels of Service and Asset Management Strategies (Sections 3 and 4) tell us what we need to do to maintain our assets in a condition that meets the needs of the community. Finally, the Financial Strategies (Section 5) identify options to fund the management actions that we need to take. This section answers the questions, ''how much will it cost?' and 'how can we fund it?'

It is important to note that the requirements of O. Reg. 588/17 only require the current version of the plan to address core infrastructure assets based on the delivery of the current level of service and the current annual level of investment. To ensure that Council has the complete picture respecting the Township's assets, the following analysis of core infrastructure must also be completed for non-core infrastructure. That information, coupled with the various Master Plans (Fire, Recreation, Parks and Trails, and Transportation) will be needed to ensure Council has the appropriate level of information upon which to make decisions about proposed service levels, which O. Reg. 588/17 requires by 2025. Decisions on proposed service levels will involve an in depth analysis of cost scenarios which will ultimately yield a financing strategy.

For this reason, no funding scenarios are presented in this version of the Plan. As noted, future versions of the plan will explore the range of alternatives and require Township Council to adopt documented levels of service and financing strategies to fund the plan.

5.1 Yearly Expenditure Forecasts

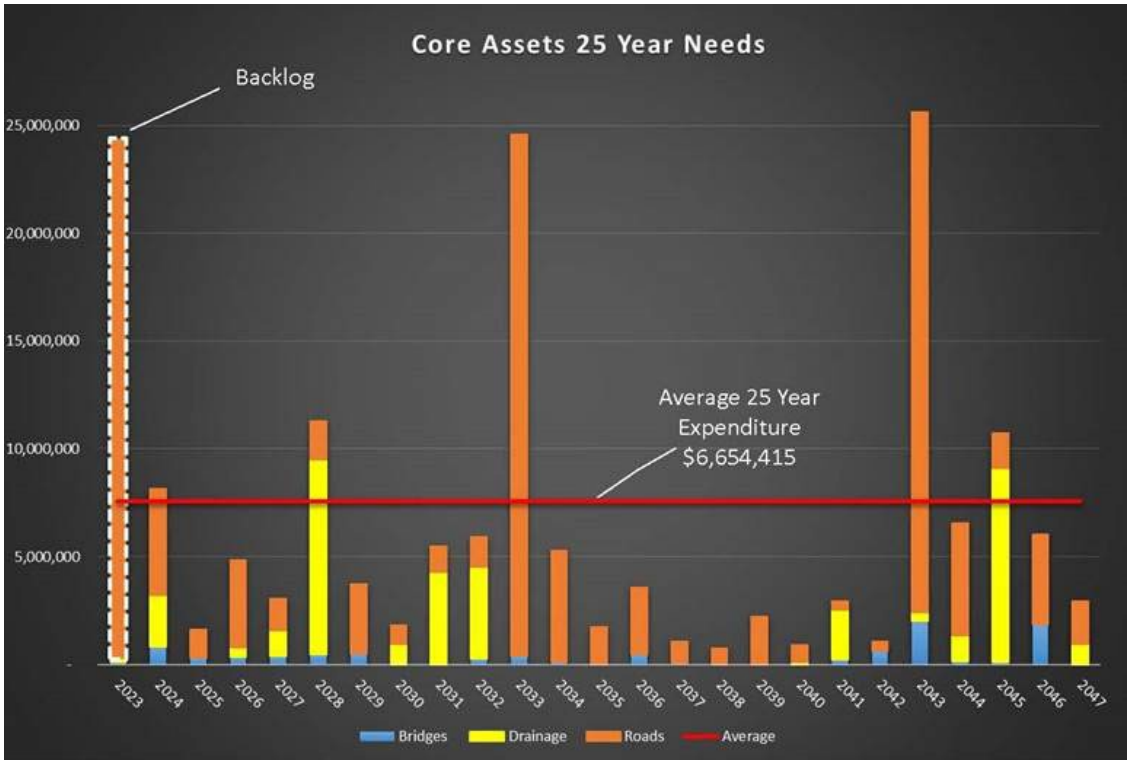
Long term asset investment forecasts provide insight into prospective investment requirements which may fall outside of the 10-year planning horizon typically used for capital budgeting processes. The large numbers of assets constructed during the short time span of the 1960's and 1970's will require equally heavy investment once those assets reach the end of their service lives. If those investment requirements are not made, levels of service will decline and operations and maintenance costs increase. A long range forecast should cover the entire lifecycle of all of the assets, therefore allowing identification of such trends.

Funding and re-investment requirements were developed for each asset class based on the analysis to establish an average annual lifecycle cost. Each of the forecasts has been broken down into the following lifecycle activities, for consistency with **Section 4**, Lifecycle Management Strategies:

- Non-infrastructure solutions;
- Maintenance activities;
- Renewal/rehabilitation activities;
- Replacement activities;
- Disposal activities; and
- Expansion activities.

The investment forecast takes into consideration statistical parameters that utilize the condition, estimated service lives, replacement costs and lifecycle probability distributions to provide trends of sustainable costs on a given year. The replacement trends can then be used to develop medium-term (25-year) replacement requirements and average annual costs. As more and better information becomes available, future versions of the AMP should expand these projections out to the long term (100 year) time horizon. The replacement costs are based on 2020 average tender prices, 2019 condition assessments, asset valuations, and insurance assessed values.

Figure 35 depicts the annual capital investment requirements across the Township's core asset portfolio.



It should be noted that the forecasts do not include inflation, as this level of sophistication is not warranted at this time given the uncertainties inherent within the analysis. Future versions of the plan will include an allowance for the impacts of inflation where appropriate.

Figure 35 shows that there are currently deferred investment (backlog) needs of at least $24.2 M or 6.4 percent of total asset value. The 'deferred investment needs' refers to an outstanding capital need, which arose in the past, but has not been addressed (i.e. assets that fall within the poor and very poor rating category because their remaining service life is below zero). This could be related to asset deterioration, capacity shortfalls or required service standard upgrades.

The figure also shows various spikes in the investment forecasts, which is typically due to large assets with high replacement value, or groups of assets, being required to be rehabilitated, or replaced in a given year. An example of this can been seen in areas of post-war growth where communities were built and developed en masse with significant investments in new assets made over a relatively short time period. The average annual expenditure required to service these needs is expected to be approximately $6.7 M per year.

When developing the 100 Year Lifecycle Reinvestment Requirements, careful consideration will need to be given to the value of expansion in for at least the first 25 years of the plan. To achieve this, it is imperative that the Township complete the various master plans currently underway (Parks, Fire, Transportation) and ensure that these are coordinated in successive versions of the Development Charges Study. Beyond 2047 consideration should be given to inclusion of percentage allowance for growth related needs.

5.2 Council Approved Capital Budget for the Past Five Years

The Council approved capital budget for each asset system from the previous five years is provided in **Table 21**.

Table 21. Historical Capital Investment Trends by Asset Type

Asset System	2018	2019	2020	2021	2022
Bridges and Culverts	100,000	300,000	1,130,0000	1,220,000	2,025,000
Roads	661,900	512,300	914,500	1,678,800	1,713,500
Stormwater	108,000	140,000	50,000	115,000	50,000
Total	869,900	952,300	2,094,500	3,013,800	3,788,500

Note: **Shown budget amounts exclude non-asset related budgets.*

As can be seen the re-investment in core infrastructure has risen from less than $1.0 M in 2018 to over $3.7 M in 2022. In any given year, priority has been given to the upkeep of the bridge and culvert stock with the remaining funds distributed between roads and drainage infrastructure.

5.3 Breakdown of Revenues by Source

Several financing strategies are typically available to fund capital projects. These strategies vary on a project-by- project basis. The typical financing strategies used by the Township are as follows:

- **Pay as you go:** Saving all funds in advance of building or acquiring an asset. This strategy is long range in nature and sometimes requires foregoing needs in the short term until enough capital has been saved to carry out the required project.
- **Reserve Accounts:** Contributing revenues to a reserve account, and drawing funds from the account. This strategy allows a reserve 'threshold' to be set to provide a buffer for unexpected expenditures. It also allows lifecycle contributions to be made on an annual basis which can be drawn upon when needed.
- **Debenture Financing:** A loan issued to the organization for building or acquiring an asset, which involves repayment annually with interest. The Province has limits on the total amount of debt which is based on an annual repayment limit of 25 per cent of the municipality's source revenue.
- **Third-Party Contributions:** Contributions from parties external to the organization. This typically comes from contributions, subsidies and recoveries from development or grants from senior levels of government. This funding strategy impacts rates (except in the case of grants and subsidies).
- **User Fees:** Rates charged to the users of a service.

For the most part, the Township uses a combination of all of the above funding strategies depending on the specific project. It is noted that the Township has traditionally had an aversion to the use of debt financing for the funding of projects. In this regard, and as a general statement of principle, debt financing should only be used to fund significant new items of infrastructure. Debt financing should not be used to fund rehabilitation or replacement of existing assets.

Like most municipalities across Canada, the Township has experienced a dramatic decrease in funding from senior levels of government dedicated to municipal capital works and operations over the past two decades. To compensate, the Township has mainly had to increase property taxes in order to fund municipal operations. Wherever possible, the Township also pursues grant funding. Historically, increases in revenues have not kept pace with the rate of inflation and have not been reflective or the true cost of delivering the service and/or been sufficient to keep pace with the rate of deterioration of the Township's assets.

The Township has traditionally used short- term analyses (10 Year Capital Forecast) to develop its capital plans and financing strategies. The current analysis should be based on a medium range analysis (25 years). It is recommended that these analyses should eventually be expanded to include 100-year sustainability forecasts in order to fully identify the long term trends over the full life cycle of the assets.

For the purposes of analysis, the yearly breakdown of revenues by confirmed source is provided in **Table 22**.

Table 22. Yearly Breakdown of Revenues (Operating and Capital) by Confirmed Source*

Revenue Source	2018	2019	2020	2021	2022**
Property Tax Levy	11,021,200	11,139,400	11,932,200	12,612,400	13,029,600
Other Tax Revenue	676,100	817,900	730,700	831,500	851,500
Non-Tax Revenues	3,438,400	3,419,300	3,439,800	3,477,400	3,823,300
Transfer From Reserve	69,100	28,200	61,500	419,000	210,000
Development Charges	0	0	0	0	0
Debt	0	0	0	0	0
Total	**15,204,700**	**15,404,700**	**16,164,100**	**17,340,300**	**17,914,400**

Note:

* *Revenue by confirmed source excludes non-asset related revenues.*

** *2022 figures based on budget*

Note that the Township does not dedicate specific funding sources for individual asset classes. The sources in Table 22 cover both operating and capital works. The portion of the tax levy revenue in each year is devoted to working reserves from which funds are drawn to fund individual capital projects.

Also notable is that as a source of funding, the development charges (DC's) reserve has historically not been used to the extent that it could be. Typically DC's are used (as required by statute) to fund growth related projects. It can and should be argued that there is a growth related component to most projects and a concerted effort should be made in the future to draw on this as a source to fund future works. Staff should also devote greater energies to identifying the growth related components of the capital program in preparation for future updates of the Development Charges By-Law.

5.4 Key Assumptions

As with any initial plan, a variety of gaps and opportunities were identified when developing the financial analysis. These gaps will direct future improvements in the documenting and reporting process, and will be fine-tuned as the Township's Corporate Asset Management Program matures.

This initial version of the asset management plan was developed based on the best available information and making assumptions using professional judgment to address gaps. The analysis conducted in this lifecycle assessment is based upon the following key assumptions:

- Assets degrade linearly. This assumption needs to be corrected in future editions of the plan in order to more accurately predict the type and timing of the required treatments;
- Installation dates, where they were unavailable, were assumed;
- All assets perform based on industry standard service lives. This approach does not reflect the conditions that are unique or specific to the Township;
- Use of age-based condition assessment in the absence of actual condition information; and
- Estimates of costs based on professional judgment where cost information was unavailable.

Where any of the above assumptions have been used, a corresponding action item has been developed to close any gaps in the future.

5.5 Growing Needs and Funding Shortfalls

Figure 36 illustrates the cumulative impact of maintaining the current levels of expenditure over the next 25 years. This analysis is based on an assumptions of industry standard timeframes for major rehabilitation or replacement work to the asset to ensure performance. Levels of Service can dictate these timeframes through a process of determining preferred levels of service, and acceptable asset performance in supporting these services.

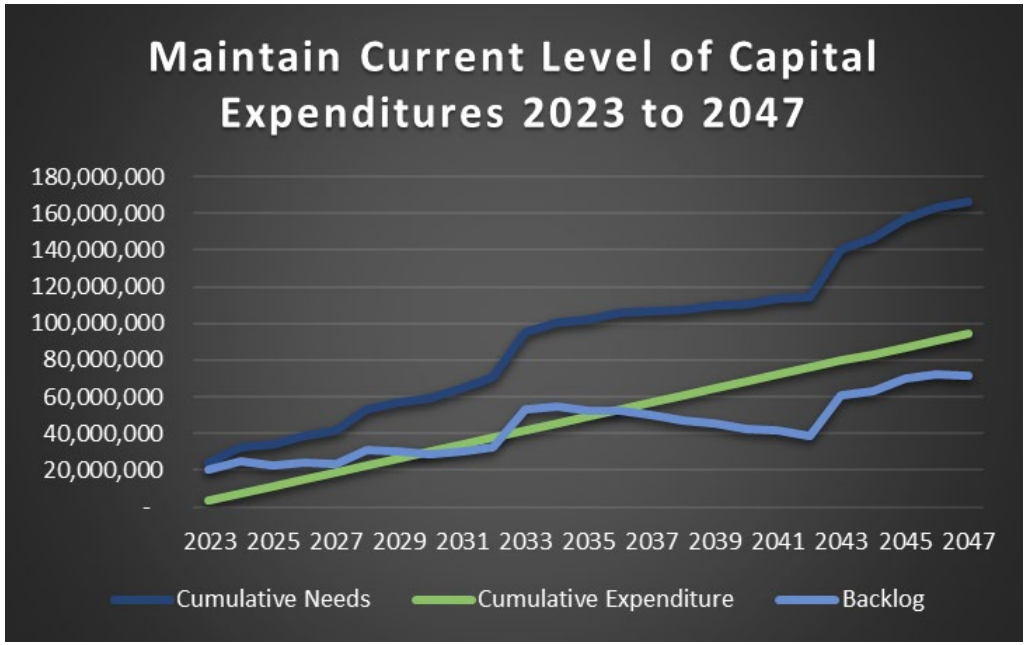


Figure 36: Impact of Current Level of Capital Investment

It is anticipated that the needs over the course of next 25 years will be approximately $166.4 M. Based on maintaining the current level of the re-investment in the core infrastructure ($3.8 M per year), the backlog of unmet needs financial analysis shows a steady increase to a maximum of $71.7 M or 18.1 percent of overall asset value by 2047. The increase in the value of the backlog is indicative of a corresponding decrease in the condition of the infrastructure.

It should be noted that the analysis considers only capital funding, and does not consider the current reserve position. Therefore, an annual increase does not specifically correlate to a direct increase to rates or the tax levy, as funding could come from a variety of sources, including but not limited to existing reserves or grants and subsidies. In future versions of the plan, further analysis is be completed by asset class to evaluate options for funding.

Mitigating Costs

There are techniques that can be employed to disperse costs over the years to reduce immediate impacts. One approach could be to extend assumed asset service lives. The typical industry practice is to assume extensions in service lives by up to 10 per cent. This would reduce capital expenditures as well as spread out significant maintenance costs (such as replacing large motors, finishes, surfacing on roadways and sidewalks, etc.). However, the consequences of this approach would be a corresponding increase in regular maintenance costs (more repairs to motors, more partial finish replacements in buildings, more potholes requiring fixing on roadways, etc.). Additionally, it is likely that the overall levels of service would be impacted, and likely reduced.

Another potential solution could involve an in depth examination of the required levels of service, which is required by O. Reg. 588/17. If, in general, the desired level of service is reduced then associated costs can also be reduced. Lowering the levels of service will result in reduced capital and maintenance costs (for example, all roads can be of poor condition or better rating, rather than maintaining all roads in fair condition or better rating). Of course, it is essential to balance the desired levels of service against costs, and risks. Reduction of the levels of service, however, can also result in other negative consequences and increased risks not the least of which is a shortened life of the asset, premature failure and the consequent loss of public confidence. It is essential to carefully assess all decisions, and potential consequences, before committing to a course of action, and to balance out the risks, levels of service, condition requirements, and costs with one another.

Backlog

It is suggested that the extent of the projected backlog may be too large and that steps may have to be taken to reduce the value to a more manageable level. What that more appropriate level is, is a matter of debate. Asset management seeks to determine the optimal approach to lifecycle management. Over the next couple of years Staff will conduct a benchmarking review of municipalities of a comparable nature, with the purpose of understanding their levels of service and re-investment needs. This will assist Council in assessing potential levels of service to ensure acceptable performance in all areas of the asset lifecycle and that will inform capital and maintenance planning.

The tax-funded capital work, in particular, will struggle with shortfalls of funding that cannot be compensated for, either through reductions of services or condition expectations, and will be untenable to mitigate through debt financing. In these instances, it will be particularly important to engage in risk analysis to identify these areas beforehand, and allow staff to prioritize investment funding accordingly. This will allow identification of which assets are low priority, or can be run to failure if the need arises, and where funding can be redirected from with the least negative consequence.

SECTION 6: IMPROVEMENT AND MONITORING

6 Improvement and Monitoring

One of the goals of this asset management plan is to establish a baseline of the current asset management practices. Continually improving with additional information and revised practices will lead to revised versions of the plan over time. This section, presents the proposed continuous improvement program in terms of two components:

- Actions related to creating future versions of the asset management plan; and
- Actions to advance the Township's overall asset management practices/capabilities.

Where possible, the benefits and costs of these components are included to support planning processes.

6.1 Creating Future Versions of the Asset Management Plan

Expand information of the Asset Management Plan to Include All Assets

The next version of the plan is required to cover all core and non-core assets under the jurisdiction of the Township. This will occur in 2023.

6.1.1. Improvements to Existing Sections

Proposed improvement and enhancements recommended to minimize gaps in this asset management plan are categorized by section, and identified below:

Section 1: Introduction

- None

Section 2: State of the Assets

The majority of the actions related to the state of the assets section are based upon improving data accuracy. In particular:

- Conducting additional/updated condition assessments on key asset groups;
- Establishing a centralized asset inventory;
- Updating and improving cost estimates for all key assets to reflect current conditions; and
- Improving lifecycle analysis tools for more automation and incorporation of various deterioration curves.

Section 3: Desired Levels of Service

Incorporate the following key sub-sections:

- Ratepayer Feedback and Expectations:
  - Background ratepayer engagement results gathered through planning studies (Fire Master Plan Parks and Recreation Master Plan, Transportation Master Plan, etc.) and proposed approach for future consultations; and
  - Details of how ratepayer engagement has been considered in setting levels of service.
- Strategic and corporate goals:
  - Organization strategic goals and impacts on levels of service.
- Legislative Requirements:
  - Incorporate additional background legislation or regulations that will affect asset operation or require certain levels of service.
- Current Levels of Service:
  - Define current levels of service being provided by the assets;
  - Identify related performance measures; and
  - Incorporate how the Township compares to other organizations.
- Desired Levels of Service:
  - Provide details on level of service enhancements being requested and providing a recommendation an appropriate level of service; and
  - Identify differences between current and recommended levels of service and how these gaps can be progressively closed.

Section 4: Lifecycle Management Strategies

Expand existing coverage to include the following:

- Non-Infrastructure:
  - Detailed forecast and itemized list of non-infrastructure projects and initiatives.
- Operations and Maintenance:

- Documentation of issues, trends and decision making processes (planned and unplanned);
- Defining maintenance strategies, methods to meet the required levels of service;
- Forecast of planned and unplanned operations and maintenance work cost.

- Renewal/Replacements:
  - Define how replacements/renewals are identified and the standards for replacement;
  - Enhanced end of life projections.
- Expansions:
  - Document procedures for asset creation/acquisition;
- Disposals:
  - Forecast future disposal of assets including savings, timing and costs.

Section 5: Financial Strategy

Add the following sections:

- Valuation Forecasts:
  - Forecast the future value of asset and valuation methodology
  - Forecast depreciation.
- Key Assumptions made in the Financial Forecasts:
  - Documentation of the key assumptions made in the forecasts and the risks that they might change.
- Forecast Reliability and Confidence:
  - Sensitivity analysis quantifying the variations in the forecasts resulting from possibly scenarios relating to variations of the key assumptions.

Section 6: Improvement and Monitoring

Include the following:

- Status of Asset Management Practices:
  - Current and desired state of Asset Management processes, data and systems.
- Improvement Program:
  - Details of actions proposed and timetables for improving accuracy and confidence in the asset management plan, indicating responsibility of each actions; and
  - Details of resources required to implement the improvement program.
- Monitoring and Review Procedures:
  - Procedures and timetable for performance reporting (e.g. independent audits, self- assessments etc.).
  - Timetable for external audit and review (of process, data integrity and level of service).
- Performance Measures:
  - Outline performance measures for the asset management system; and
  - Describe how the effectiveness of the asset management plan will be measured.

6.1.2. New Sections to be Added

Future Demand (to be added before Section 4: Lifecycle Management Strategies). This new section will provide details of the Township's portion of the District growth forecasts which affect the management and utilization of assets.

Risk Management Plan (to be added before Financial Strategy). This new section will detail the processes of identifying risks that may affect the ongoing delivery of services from infrastructure, including the risk context (probability, consequence, and risk rating tables).

6.2. Advancing Corporate Asset Management Capabilities

As has been mentioned earlier in this document, there are a number of industry standards for asset management that have been released in recent years including:

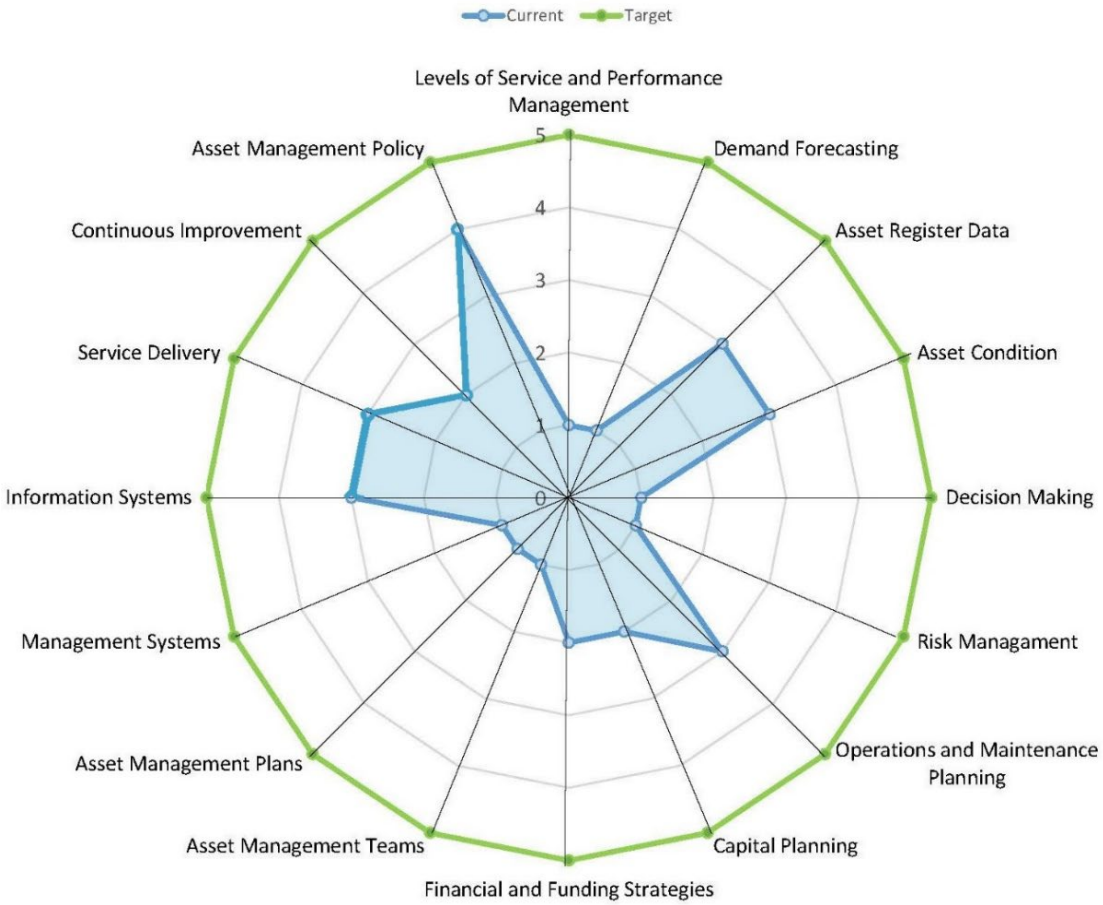
- MFOA
- ISO 55000;
- International Infrastructure Management Manual, 2015; and
- BSI PAS55:2008.

Each of the above standards have been developed over a number of years based on provincial, federal and international collaboration, and are widely regarded as best practices in the field of asset management. Each of them defines the key principles of asset management maturity, and includes frameworks upon which an organization can evaluate its maturity and diagnose opportunities to advance maturity and capabilities in asset management.

In order for the Township to evaluate the current capabilities and develop a work plan towards asset management maturity, the Township should conduct periodic reviews of the asset management system. The outcome of the assessment should be an analysis that identifies performance gaps and strengths across a range of domains and will help guide the Township on the path to maturity.

Figure 37 provides a radar chart that shows an evaluation of the current level of maturity, against the overall target maturity. This chart provides a visual tool to evaluate gaps against targets for the asset management system. It should be noted that this represents a corporate-wide perspective, and it is challenging to generalize across all asset systems.

Figure 37. Current and Target Asset Management Maturity based on the IIMM and ISO55000



An overall work plan (**Table 23**) has been developed to work towards advancing asset management maturity as shown in **Figure 37**. The proposed work plan aims to build upon the Township's existing strengths to develop a program that balances costs, opportunities and risks against the desired levels of service, to achieve the organizational objectives. Each opportunity, the targeted benefits, the proposed timeline, and responsibilities are presented.

Table 23. 2022 to 2024 Asset Management Work Plan Initiatives

ID	Work Plan Item	Timing	Targeted Benefits	Respons.
1.1	Core Infrastructure Asset Management Plan	2022	• Identify current state of infrastructure and levels of service. • Identify strategies for managing core assets. • Identify options for funding ongoing asset operations.	Internal
2.1	Data Update	2023	• Input new data to the Asset Management System • Update existing information core and non-core assets to reflect best available data.	Internal/ External
2.2	Corporate Asset Management Plan	2023	• Expand Asset Management Plan to cover all assets under Township control.	Internal
2.3	Core Services Analysis	2023	• Analysis of activities necessary to keep infrastructure in good state of repair • Prepare long term capital forecasts a minimum of one lifecycle	Internal
3.1	Data Update	2024	• Input new data to the Asset Management System • Update existing information core and non-core assets to reflect best available data.	Internal/ External
3.2	Asset Management Policy Update	2024	• Updates to incorporate any best practices, strategic document, or regulatory changes.	Internal
3.3	Level of Service Analysis	2024	• Identify LOS scenarios • Updates future needs • Examines cost implications	Internal
3.4	Financial Plan Development	2024	• Consolidate long term needs • Identify funding alternatives • Financial plan development for all assets	External
3.5	Corporate Asset Management Plan	2024	• Clarifies the vision for Asset Management of all assets and provides a mandate and direction for staff. • Forms the basis of discussion with Council regarding the impact on levels of service and changes to the capital works budget. • Provides a business case for the long term financial forecasts.	Internal
3.6	Individual Asset System Management Plans	2024	• Establishes long term plans (typically 20 years or more for infrastructure assets) that outline the asset activities for each asset system, and resources to provide a defined level of service in the most effective way. • Establishes detailed road map for future asset management activities by asset system	Internal

SECTION 7: CONCLUSIONS

7 Conclusions

The Township of Muskoka Lakes Core Asset Management Plan outlines asset management processes and practices in place at the present time as it relates to its core assets. Asset management practices within some asset groups are more advanced than others however overall the Township's asset management practices are relatively early in their development. A number of targeted strategies have been identified to advance the overall level of practice over the next few years.

Table 24 provides an overview of the replacement value and condition rating of the Township's core assets. Overall, the Township's core asset portfolio has approximately 59 per cent remaining service life (weighted by replacement value). Of the portfolio, approximately 9 per cent, or $34.1 million in assets are within the poor and very poor rating categories and are beyond their typical service lives.

Table 24. Asset System Ratings Based on Service Life and Condition

Asset System	Asset Category	2020 Replacement Value	% Remaining Service Life	Rating category	% of Assets Below 40% Remaining Service Life	2020 Replacement Value
Transportation	Bridges and Culverts	$22,814,000	25%	Poor	23%	$5,206,000
	Roads	$329,204,500	64%	Good	8%	$25,806,300
	Railway Crossings	$90,000	64%	Good	0%	$0
	Sidewalks	$285,155	52%	Fair	1%	$1,300
	Signs	$357,600	57%	Fair	19%	$67,000
	Streetlighting	$1,321,775	87%	Very Good	0%	$0
Storm Water		$44,106,500	44%	Fair	7%	$2,985,900
Total		**$398,179,530**	**59%**	**Fair**	**9%**	**$34,066,500**

In 2023, the Township will be embarking on several key initiatives that will help define levels of service over the long term. The vision is that the Township will establish the key levels of service requirements, and better understand the relationship between the levels of service and costs to provide the service. The Township will develop tools and techniques to predictively model levels of service over time.

In 2022 the core asset systems have approximately $25 million in deferred capital. It should be noted that the analysis considers only capital funding, and does not consider the current reserve position. Therefore, the percentage annual increase to reduce or eliminate the backlog of needs does not specifically correlate to a direct increase to rates or the tax levy. Council could potentially fund the reduction of the backlog from a variety of sources including but not limited to existing reserves or grants and subsidies. In future asset management plans, further analysis is to be completed by asset system to evaluate options for funding.

The plan highlights lifecycle activities which are tied to lifecycle funding forecasts.

One of the goals of this asset management plan was to establish a high-level baseline of the asset management practices at the Township. This forms the basis for a work plan to continually improve the asset management maturity at the Township based on two initiatives:

- Actions related to improving future asset management plans; and
- Actions to advance the Township's overall asset management capabilities.

Asset management can provide a mechanism for reliable, repeatable, and transparent decision making. However, asset management is more than just a project and to realize the full benefits the principles should be incorporated into the day to day business practices of all asset-owning departments.

APPENDIX I

Français

ONTARIO REGULATION 588/17

made under the

INFRASTRUCTURE FOR JOBS AND PROSPERITY ACT, 2015

Made: December 13, 2017
Filed: December 27, 2017
Published on e-Laws: December 27, 2017
Printed in *The Ontario Gazette*: January 13, 2018

ASSET MANAGEMENT PLANNING FOR MUNICIPAL INFRASTRUCTURE

CONTENTS

INTERPRETATION AND APPLICATION

Definitions

1. (1) In this Regulation,

"asset category" means a category of municipal infrastructure assets that is,

(a) an aggregate of assets described in each of clauses (a) to (e) of the definition of core municipal infrastructure asset, or

(b) composed of any other aggregate of municipal infrastructure assets that provide the same type of service; ("catégorie de biens")

"core municipal infrastructure asset" means any municipal infrastructure asset that is a,

(a) water asset that relates to the collection, production, treatment, storage, supply or distribution of water,

(b) wastewater asset that relates to the collection, transmission, treatment or disposal of wastewater, including any wastewater asset that from time to time manages stormwater,

(c) stormwater management asset that relates to the collection, transmission, treatment, retention, infiltration, control or disposal of stormwater,

(d) road, or

(e) bridge or culvert; ("bien d'infrastructure municipale essentiel")

"ecological functions" has the same meaning as in Ontario Regulation 140/02 (Oak Ridges Moraine Conservation Plan) made under the *Oak Ridges Moraine Conservation Act, 2001*; ("fonctions écologiques")

"green infrastructure asset" means an infrastructure asset consisting of natural or human-made elements that provide ecological and hydrological functions and processes and includes natural heritage features and systems, parklands, stormwater management systems, street trees, urban forests, natural channels, permeable surfaces and green roofs; ("bien d'infrastructure verte")

"hydrological functions" has the same meaning as in Ontario Regulation 140/02; ("fonctions hydrologiques")

"joint municipal water board" means a joint board established in accordance with a transfer order made under the *Municipal Water and Sewage Transfer Act, 1997*; ("conseil mixte de gestion municipale des eaux")

"lifecycle activities" means activities undertaken with respect to a municipal infrastructure asset over its service life, including constructing, maintaining, renewing, operating and decommissioning, and all engineering and design work associated with those activities; ("activités relatives au cycle de vie")

"municipal infrastructure asset" means an infrastructure asset, including a green infrastructure asset, directly owned by a municipality or included on the consolidated financial statements of a municipality, but does not include an infrastructure asset that is managed by a joint municipal water board; ("bien d'infrastructure municipale")

"municipality" has the same meaning as in the *Municipal Act, 2001*; ("municipalité")

"operating costs" means the aggregate of costs, including energy costs, of operating a municipal infrastructure asset over its service life; ("frais d'exploitation")

"service life" means the total period during which a municipal infrastructure asset is in use or is available to be used; ("durée de vie")

"significant operating costs" means, where the operating costs with respect to all municipal infrastructure assets within an asset category are in excess of a threshold amount set by the municipality, the total amount of those operating costs. ("frais d'exploitation importants")

(2) In Tables 1 and 2,

"connection-days" means the number of properties connected to a municipal system that are affected by a service issue, multiplied by the number of days on which those properties are affected by the service issue. ("jours-branchements")

(3) In Table 4,

"arterial roads" means Class 1 and Class 2 highways as determined under the Table to section 1 of Ontario Regulation 239/02 (Minimum Maintenance Standards for Municipal Highways) made under the *Municipal Act, 2001*; ("artères")

"collector roads" means Class 3 and Class 4 highways as determined under the Table to section 1 of Ontario Regulation 239/02; ("routes collectrices")

"lane-kilometre" means a kilometre-long segment of roadway that is a single lane in width; ("kilomètre de voie")

"local roads" means Class 5 and Class 6 highways as determined under the Table to section 1 of Ontario Regulation 239/02. ("routes locales")

(4) In Table 5,

"Ontario Structure Inspection Manual" means the Ontario Structure Inspection Manual (OSIM), published by the Ministry of Transportation and dated October 2000 (revised November 2003 and April 2008) and available on a Government of Ontario website; ("manuel d'inspection des structures de l'Ontario")

"structural culvert" has the meaning set out for "culvert (structural)" in the Ontario Structure Inspection Manual. ("ponceau structurel")

Application

2. For the purposes of section 6 of the Act, every municipality is prescribed as a broader public sector entity to which that section applies.

STRATEGIC ASSET MANAGEMENT POLICIES

Strategic asset management policy

3. (1) Every municipality shall prepare a strategic asset management policy that includes the following:

1. Any of the municipality's goals, policies or plans that are supported by its asset management plan.
2. The process by which the asset management plan is to be considered in the development of the municipality's budget or of any long-term financial plans of the municipality that take into account municipal infrastructure assets.
3. The municipality's approach to continuous improvement and adoption of appropriate practices regarding asset management planning.
4. The principles to be followed by the municipality in its asset management planning, which must include the principles set out in section 3 of the Act.
5. The municipality's commitment to consider, as part of its asset management planning,
    i. the actions that may be required to address the vulnerabilities that may be caused by climate change to the municipality's infrastructure assets, in respect of such matters as,
        A. operations, such as increased maintenance schedules,
        B. levels of service, and
        C. lifecycle management,
    ii. the anticipated costs that could arise from the vulnerabilities described in subparagraph i,
    iii. adaptation opportunities that may be undertaken to manage the vulnerabilities described in subparagraph i,
    iv. mitigation approaches to climate change, such as greenhouse gas emission reduction goals and targets, and
    v. disaster planning and contingency funding.
6. A process to ensure that the municipality's asset management planning is aligned with any of the following financial plans:
    i. Financial plans related to the municipality's water assets including any financial plans prepared under the *Safe Drinking Water Act, 2002*.
    ii. Financial plans related to the municipality's wastewater assets.
7. A process to ensure that the municipality's asset management planning is aligned with Ontario's land-use planning framework, including any relevant policy statements issued under subsection 3 (1) of the *Planning Act*, any provincial plans as defined in the *Planning Act* and the municipality's official plan.
8. An explanation of the capitalization thresholds used to determine which assets are to be included in the municipality's asset management plan and how the thresholds compare to those in the municipality's tangible capital asset policy, if it has one.
9. The municipality's commitment to coordinate planning for asset management, where municipal infrastructure assets connect or are interrelated with those of its upper-tier municipality, neighbouring municipalities or jointly-owned municipal bodies.
10. The persons responsible for the municipality's asset management planning, including the executive lead.
11. An explanation of the municipal council's involvement in the municipality's asset management planning.
12. The municipality's commitment to provide opportunities for municipal residents and other interested parties to provide input into the municipality's asset management planning.

(2) For the purposes of this section,

"capitalization threshold" is the value of a municipal infrastructure asset at or above which a municipality will capitalize the value of it and below which it will expense the value of it. ("seuil de capitalisation")

Update of asset management policy

4. Every municipality shall prepare its first strategic asset management policy by July 1, 2019 and shall review and, if necessary, update it at least every five years.

ASSET MANAGEMENT PLANS

Asset management plans, current levels of service

5. (1) Every municipality shall prepare an asset management plan in respect of its core municipal infrastructure assets by July 1, 2021, and in respect of all of its other municipal infrastructure assets by July 1, 2023.

(2) A municipality's asset management plan must include the following:

1. For each asset category, the current levels of service being provided, determined in accordance with the following qualitative descriptions and technical metrics and based on data from at most the two calendar years prior to the year in which all information required under this section is included in the asset management plan:
    i. With respect to core municipal infrastructure assets, the qualitative descriptions set out in Column 2 and the technical metrics set out in Column 3 of Table 1, 2, 3, 4 or 5, as the case may be.
    ii. With respect to all other municipal infrastructure assets, the qualitative descriptions and technical metrics established by the municipality.
2. The current performance of each asset category, determined in accordance with the performance measures established by the municipality, such as those that would measure energy usage and operating efficiency, and based on data from at most two calendar years prior to the year in which all information required under this section is included in the asset management plan.
3. For each asset category,
    i. a summary of the assets in the category,
    ii. the replacement cost of the assets in the category,
    iii. the average age of the assets in the category, determined by assessing the average age of the components of the assets,
    iv. the information available on the condition of the assets in the category, and
    v. a description of the municipality's approach to assessing the condition of the assets in the category, based on recognized and generally accepted good engineering practices where appropriate.
4. For each asset category, the lifecycle activities that would need to be undertaken to maintain the current levels of service as described in paragraph 1 for each of the 10 years following the year for which the current levels of service under paragraph 1 are determined and the costs of providing those activities based on an assessment of the following:
    i. The full lifecycle of the assets.
    ii. The options for which lifecycle activities could potentially be undertaken to maintain the current levels of service.
    iii. The risks associated with the options referred to in subparagraph ii.
    iv. The lifecycle activities referred to in subparagraph ii that can be undertaken for the lowest cost to maintain the current levels of service.
5. For municipalities with a population of less than 25,000, as reported by Statistics Canada in the most recent official census, the following:
    i. A description of assumptions regarding future changes in population or economic activity.
    ii. How the assumptions referred to in subparagraph i relate to the information required by paragraph 4.
6. For municipalities with a population of 25,000 or more, as reported by Statistics Canada in the most recent official census, the following:

i. With respect to municipalities in the Greater Golden Horseshoe growth plan area, if the population and employment forecasts for the municipality are set out in Schedule 3 or 7 to the 2017 Growth Plan, those forecasts.

ii. With respect to lower-tier municipalities in the Greater Golden Horseshoe growth plan area, if the population and employment forecasts for the municipality are not set out in Schedule 7 to the 2017 Growth Plan, the portion of the forecasts allocated to the lower-tier municipality in the official plan of the upper-tier municipality of which it is a part.

iii. With respect to upper-tier municipalities or single-tier municipalities outside of the Greater Golden Horseshoe growth plan area, the population and employment forecasts for the municipality that are set out in its official plan.

iv. With respect to lower-tier municipalities outside of the Greater Golden Horseshoe growth plan area, the population and employment forecasts for the lower-tier municipality that are set out in the official plan of the upper-tier municipality of which it is a part.

v. If, with respect to any municipality referred to in subparagraph iii or iv, the population and employment forecasts for the municipality cannot be determined as set out in those subparagraphs, a description of assumptions regarding future changes in population or economic activity.

vi. For each of the 10 years following the year for which the current levels of service under paragraph 1 are determined, the estimated capital expenditures and significant operating costs related to the lifecycle activities required to maintain the current levels of service in order to accommodate projected increases in demand caused by growth, including estimated capital expenditures and significant operating costs related to new construction or to upgrading of existing municipal infrastructure assets.

(3) Every asset management plan must indicate how all background information and reports upon which the information required by paragraph 3 of subsection (2) is based will be made available to the public.

(4) In this section,

"2017 Growth Plan" means the Growth Plan for the Greater Golden Horseshoe, 2017 that was approved under subsection 7 (6) of the *Places to Grow Act, 2005* on May 16, 2017 and came into effect on July 1, 2017; ("Plan de croissance de 2017")

"Greater Golden Horseshoe growth plan area" means the area designated by section 2 of Ontario Regulation 416/05 (Growth Plan Areas) made under the *Places to Grow Act, 2005*. ("zone de croissance planifiée de la région élargie du Golden Horseshoe")

Asset management plans, proposed levels of service

6. (1) Subject to subsection (2), by July 1, 2024, every asset management plan prepared under section 5 must include the following additional information:

1. For each asset category, the levels of service that the municipality proposes to provide for each of the 10 years following the year in which all information required under section 5 and this section is included in the asset management plan, determined in accordance with the following qualitative descriptions and technical metrics:
   i. With respect to core municipal infrastructure assets, the qualitative descriptions set out in Column 2 and the technical metrics set out in Column 3 of Table 1, 2, 3, 4 or 5, as the case may be.
   ii. With respect to all other municipal infrastructure assets, the qualitative descriptions and technical metrics established by the municipality.
2. An explanation of why the proposed levels of service under paragraph 1 are appropriate for the municipality, based on an assessment of the following:
   i. The options for the proposed levels of service and the risks associated with those options to the long term sustainability of the municipality.
   ii. How the proposed levels of service differ from the current levels of service set out under paragraph 1 of subsection 5 (2).
   iii. Whether the proposed levels of service are achievable.
   iv. The municipality's ability to afford the proposed levels of service.
3. The proposed performance of each asset category for each year of the 10-year period referred to in paragraph 1, determined in accordance with the performance measures established by the municipality, such as those that would measure energy usage and operating efficiency.
4. A lifecycle management and financial strategy that sets out the following information with respect to the assets in each asset category for the 10-year period referred to in paragraph 1:

i. An identification of the lifecycle activities that would need to be undertaken to provide the proposed levels of service described in paragraph 1, based on an assessment of the following:

A. The full lifecycle of the assets.

B. The options for which lifecycle activities could potentially be undertaken to achieve the proposed levels of service.

C. The risks associated with the options referred to in sub-subparagraph B.

D. The lifecycle activities referred to in sub-subparagraph B that can be undertaken for the lowest cost to achieve the proposed levels of service.

ii. An estimate of the annual costs for each of the 10 years of undertaking the lifecycle activities identified in subparagraph i, separated into capital expenditures and significant operating costs.

iii. An identification of the annual funding projected to be available to undertake lifecycle activities and an explanation of the options examined by the municipality to maximize the funding projected to be available.

iv. If, based on the funding projected to be available, the municipality identifies a funding shortfall for the lifecycle activities identified in subparagraph i,

A. an identification of the lifecycle activities, whether set out in subparagraph i or otherwise, that the municipality will undertake, and

B. if applicable, an explanation of how the municipality will manage the risks associated with not undertaking any of the lifecycle activities identified in subparagraph i.

5. For municipalities with a population of less than 25,000, as reported by Statistics Canada in the most recent official census, a discussion of how the assumptions regarding future changes in population and economic activity, set out in subparagraph 5 i of subsection 5 (2), informed the preparation of the lifecycle management and financial strategy referred to in paragraph 4 of this subsection.

6. For municipalities with a population of 25,000 or more, as reported by Statistics Canada in the most recent official census,

i. the estimated capital expenditures and significant operating costs to achieve the proposed levels of service as described in paragraph 1 in order to accommodate projected increases in demand caused by population and employment growth, as set out in the forecasts or assumptions referred to in paragraph 6 of subsection 5 (2), including estimated capital expenditures and significant operating costs related to new construction or to upgrading of existing municipal infrastructure assets,

ii. the funding projected to be available, by source, as a result of increased population and economic activity, and

iii. an overview of the risks associated with implementation of the asset management plan and any actions that would be proposed in response to those risks.

7. An explanation of any other key assumptions underlying the plan that have not previously been explained.

(2) With respect to an asset management plan prepared under section 5 on or before July 1, 2021, if the additional information required under this section is not included before July 1, 2023, the municipality shall, before including the additional information, update the current levels of service set out under paragraph 1 of subsection 5 (2) and the current performance measures set out under paragraph 2 of subsection 5 (2) based on data from the two most recent calendar years.

Update of asset management plans

7. (1) Every municipality shall review and update its asset management plan at least five years after the year in which the plan is completed under section 6 and at least every five years thereafter.

(2) The updated asset management plan must comply with the requirements set out under paragraphs 1, 2 and 3 and subparagraphs 5 i and 6 i, ii, iii, iv and v of subsection 5 (2), subsection 5 (3) and paragraphs 1 to 7 of subsection 6 (1).

Endorsement and approval required

8. Every asset management plan prepared under section 5 or 6, or updated under section 7, must be,

(a) endorsed by the executive lead of the municipality; and

(b) approved by a resolution passed by the municipal council.

Annual review of asset management planning progress

9. (1) Every municipal council shall conduct an annual review of its asset management progress on or before July 1 in each year, starting the year after the municipality's asset management plan is completed under section 6.

(2) The annual review must address,

(a) the municipality's progress in implementing its asset management plan;

(b) any factors impeding the municipality's ability to implement its asset management plan; and

(c) a strategy to address the factors described in clause (b).

Public availability

10. Every municipality shall post its current strategic asset management policy and asset management plan on a website that is available to the public, and shall provide a copy of the policy and plan to any person who requests it.

TABLE 1

WATER ASSETS

Column 1 Service attribute	Column 2 Community levels of service (qualitative descriptions)	Column 3 Technical levels of service (technical metrics)
Scope	1. Description, which may include maps, of the user groups or areas of the municipality that are connected to the municipal water system. 2. Description, which may include maps, of the user groups or areas of the municipality that have fire flow.	1. Percentage of properties connected to the municipal water system. 2. Percentage of properties where fire flow is available.
Reliability	Description of boil water advisories and service interruptions.	1. The number of connection-days per year where a boil water advisory notice is in place compared to the total number of properties connected to the municipal water system. 2. The number of connection-days per year due to water main breaks compared to the total number of properties connected to the municipal water system.

TABLE 2

WASTEWATER ASSETS

Column 1 Service attribute	Column 2 Community levels of service (qualitative descriptions)	Column 3 Technical levels of service (technical metrics)
Scope	Description, which may include maps, of the user groups or areas of the municipality that are connected to the municipal wastewater system.	Percentage of properties connected to the municipal wastewater system.
Reliability	1. Description of how combined sewers in the municipal wastewater system are designed with overflow structures in place which allow overflow during storm events to prevent backups into homes. 2. Description of the frequency and volume of overflows in combined sewers in the municipal wastewater system that occur in habitable areas or beaches. 3. Description of how stormwater can get into sanitary sewers in the municipal wastewater system, causing sewage to overflow into streets or backup into homes.	1. The number of events per year where combined sewer flow in the municipal wastewater system exceeds system capacity compared to the total number of properties connected to the municipal wastewater system. 2. The number of connection-days per year due to wastewater backups compared to the total number of properties connected to the municipal wastewater system. 3. The number of effluent violations per year due to

	4. Description of how sanitary sewers in the municipal wastewater system are designed to be resilient to avoid events described in paragraph 3. 5. Description of the effluent that is discharged from sewage treatment plants in the municipal wastewater system.	wastewater discharge compared to the total number of properties connected to the municipal wastewater system.

TABLE 3

STORMWATER MANAGEMENT ASSETS

Column 1 Service attribute	Column 2 Community levels of service (qualitative descriptions)	Column 3 Technical levels of service (technical metrics)
Scope	Description, which may include maps, of the user groups or areas of the municipality that are protected from flooding, including the extent of the protection provided by the municipal stormwater management system.	1. Percentage of properties in municipality resilient to a 100-year storm. 2. Percentage of the municipal stormwater management system resilient to a 5-year storm.

TABLE 4

ROADS

Column 1 Service attribute	Column 2 Community levels of service (qualitative descriptions)	Column 3 Technical levels of service (technical metrics)
Scope	Description, which may include maps, of the road network in the municipality and its level of connectivity.	Number of lane-kilometres of each of arterial roads, collector roads and local roads as a proportion of square kilometres of land area of the municipality.
Quality	Description or images that illustrate the different levels of road class pavement condition.	1. For paved roads in the municipality, the average pavement condition index value. 2. For unpaved roads in the municipality, the average surface condition (e.g. excellent, good, fair or poor).

TABLE 5

BRIDGES AND CULVERTS

Column 1 Service attribute	Column 2 Community levels of service (qualitative descriptions)	Column 3 Technical levels of service (technical metrics)
Scope	Description of the traffic that is supported by municipal bridges (e.g., heavy transport vehicles, motor vehicles, emergency vehicles, pedestrians, cyclists).	Percentage of bridges in the municipality with loading or dimensional restrictions.
Quality	1. Description or images of the condition of bridges and how this would affect use of the bridges. 2. Description or images of the condition of culverts and how this would affect use of the culverts.	1. For bridges in the municipality, the average bridge condition index value. 2. For structural culverts in the municipality, the average bridge condition index value.

COMMENCEMENT

Commencement

11. This Regulation comes into force on the later of January 1, 2018 and the day it is filed.

APPENDIX II

COMMITTEE OF THE WHOLE AGENDA REPORT

TO: **Mayor Harding and Members of Council MEETING DATE: April 11, 2019**

SUBJECT: Draft Strategic Asset Management Policy

RECOMMENDATION: **THAT the Committee of the Whole recommends that: Council adopt the policy as presented.**

APPROVALS:	Date	Signature
Submitted By: Ken Becking P. Eng., Director of Public Works	5/4/19	Original Signed by K. Becking
Acknowledged: Steve McDonald, CAO	5/4/19	Original Signed by S. McDonald

SUMMARY:

Ontario Regulation 588/17 requires municipalities to adopt a strategic asset management plan to guide the management of its physical

infrastructure. The policy must be in place by July 1, 2019. Staff have prepared a draft policy attached as Attachment 1 for Committee and Council's consideration.

ORIGIN:

Township of Muskoka Lakes – Senior Management Team

BACKGROUND:

In 2015 the government passed the Infrastructure for Jobs and Prosperity Act. The Act requires that all entities within the broader public sector prepare an infrastructure asset management plan in accordance with the requirements prescribed in regulation. In December 2017 the government enacted Ontario Regulation 588/17, Asset Management Planning for Municipal Infrastructure. Under the regulation municipalities are required to prepare asset management plans for their core infrastructure (roads, bridges and culverts, storm drainage systems, sanitary sewage systems and water systems) by July 1, 2021 and all infrastructure by July 1, 2023.

As a first step in the process of developing a compliant plan, the regulation requires that the municipality adopt a Strategic Asset Management Policy. The policy is required to address the

requirements as set out in section 3 of the regulation. The relevant section of the regulation is appended as Attachment 1 to the report. The Strategic Asset Management Policy is required to be in place by July 1, 2019 and to be renewed and updated every five years thereafter.

DISCUSSION:

A draft policy has been prepared for Committee and Council's consideration and is appended as Attachment 2. The policy is focused on managing our assets from a corporate perspective rather than in individual silos. The asset management program focuses everyone in the organization on four fundamental goals:

- Providing efficient, effective and sustainable service to meet the needs of our community,
- Optimizing asset value while minimizing lifecycle costs,
- Managing risks to service delivery,
- Committing to continual improvement of the CAM program.

To achieve these goals the policy sets out a series of objectives to guide our decision making. These include:

- Customer Focused
- Provide assurance to our customers through clearly defined levels of service and adhere to optimal asset management processes and practices, including investment, that are supported by continually updated asset data and performance measures.
- Innovative
- Continually improve our asset management approach, rededicating ourselves to innovation as new tools, techniques and solutions are developed.

- Fact Based Decision Making
- Uses of a formal but flexible, consistent, and repeatable approach to cost effectively manage our infrastructure assets.
- Optimal
- Make informed decisions between competing factors such as service delivery, asset quality & value, cost and risk by determining which option will deliver the optimal lifecycle value.
- Whole Lifecycle Perspective
- Consider the full impact of managing assets through their life cycle from acquisition to disposal including level of service, risk, maintenance & operating activities and costs.
- Integrated System Focused
- Evaluate an asset in terms of its role and value within the context of the greater system, as opposed to examining individual assets in isolation.
- Forward Looking & Sustainable
- Incorporate social, legislative, environmental and financial considerations into our decisions to adequately address our present and future land use planning framework, customer service commitments, environmental stewardship and regulatory requirements.
- Regulatory Compliant
- Comply with all relevant legislative, regulatory and statutory requirements.
- Risk-based
- Direct our resources, expenditures, and priorities in a way that achieves the established levels of service & benefits at an acceptable level of risk. The Corporation will provide sufficient training and resources to enable this policy to be achieved.

The policy establishes a committee consisting of the Directors of Finance and Public Works who will be responsible for leading the initiative. The policy places the onus on Council and senior staff for being the stewards of the Townships assets for the adoption of guidelines and procedures for their effective management in accordance with industry standards and best practices.

The Governance and Corporate Asset Management Frameworks (Appendices 1& 2) rely on key organizational strategies aligned with each other to deliver the desired outcomes.

- Strategies to manage risk, level of service and communication.
- Asset management strategies for lifecycle and data management for different asset classes.
- Planning based on optimized decision making model to report on capital, maintenance and financial plans.

The context and integration of asset management throughout the Township's lines of business will be formalized through references and linkages between corporate documents. Where possible and appropriate, staff will consider this policy and integrate it in the development of corporate documents such as:

- Corporate strategic plan

- Corporate financial plan
- Capital budget plan
- Climate change adaptation plan
- Operational plans and budgets
- Annual reports
- Design criteria and specifications
- Infrastructure servicing, management and replacement plans

RATIONALE:

The adoption of the policy is a requirement of the regulation.

FINANCIAL:

Undetermined at this time. The asset management plan will establish the financial requirements.

CONTACT:

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TOWNSHIP STAFF CONSULTED:

CAO
Senior Management Team

ATTACHMENTS:

Attachment 1: Excerpt from O. Reg. 588/17 Section 3: Strategic Asset Management Policy Requirements

Attachment 2: Draft Strategic Asset Management Policy for the Township of Muskoka Lakes

ATTACHMENT 1: STRATEGIC ASSET MANAGEMENT POLICY REQUIREMENTS

"Strategic Asset Management Policy

3. (1) Every municipality shall prepare a strategic asset management policy that includes the following:

1. Any of the municipality's goals, policies or plans that are supported by its asset management plan.

2. The process by which the asset management plan is to be considered in the development of the municipality's budget or of any long-term financial plans of the municipality that take into account municipal infrastructure assets.

3. The municipality's approach to continuous improvement and adoption of appropriate practices regarding asset management planning.

4. The principles to be followed by the municipality in its asset management planning, which must include the principles set out in section 3 of the Act.

5. The municipality's commitment to consider, as part of its asset management planning,

i. the actions that may be required to address the vulnerabilities that may be caused by climate change to the municipality's infrastructure assets, in respect of such matters as,

A. operations, such as increased maintenance schedules,

B. levels of service, and

C. lifecycle management,

ii. the anticipated costs that could arise from the vulnerabilities described in subparagraph i,

iii. adaptation opportunities that may be undertaken to manage the vulnerabilities described in subparagraph i,

iv. mitigation approaches to climate change, such as greenhouse gas emission reduction goals and targets, and

v. disaster planning and contingency funding.

6. A process to ensure that the municipality's asset management planning is aligned with any of the following financial plans:

i. Financial plans related to the municipality's water assets including any financial plans prepared under the Safe Drinking Water Act, 2002.

ii. Financial plans related to the municipality's wastewater assets.

7. A process to ensure that the municipality's asset management planning is aligned with Ontario's land-use planning framework, including any relevant policy statements issued under subsection 3 (1) of the Planning Act, any provincial plans as defined in the Planning Act and the municipality's official plan.

8. An explanation of the capitalization thresholds used to determine which assets are to be included in the municipality's asset management plan and how the thresholds compare to those in the municipality's tangible capital asset policy, if it has one.

9. The municipality's commitment to coordinate planning for asset management, where municipal infrastructure assets connect or are interrelated with those of its upper-tier municipality, neighbouring municipalities or jointly-owned municipal bodies.

10. The persons responsible for the municipality's asset management planning, including the executive lead.

11. An explanation of the municipal council's involvement in the municipality's asset management planning.

12. The municipality's commitment to provide opportunities for municipal residents and other interested parties to provide input into the municipality's asset management planning.

(2) For the purposes of this section,

"capitalization threshold" is the value of a municipal infrastructure asset at or above which a municipality will capitalize the value of it and below which it will expense the value of it. ("seuil de capitalisation")

Update of asset management policy

4. Every municipality shall prepare its first strategic asset management policy by July 1, 2019 and shall review and, if necessary, update it at least every five years."

ATTACHMENT 2: DRAFT STRATEGIC ASSET MANAGEMENT POLICY FOR THE TOWNSHIP OF MUSKOKA LAKES

PURPOSE:

This asset management policy expresses the commitment of Township of Muskoka Lakes Council and staff to plan, design, construct, acquire, operate, maintain, renew, replace and dispose of the Township's infrastructure assets in a way that ensures sound stewardship of public assets while delivering valued customer services and improving the quality of life.

POLICY STAEMENT:

The Corporation of the Township of Muskoka Lakes will employ a program to manage assets in a strategic, comprehensive, organization-wide manner known as Corporate Asset Management (CAM) program.

The CAM program requires that we treat all assets as essential components in an interrelated system, rather than as isolated parts. Service areas will evaluate, enhance, and maintain assets using a common framework and collaborative processes.

CAM is an integrated business approach that relies on well devised strategies, sustainable assets, trained knowledgeable staff and good communication to achieve desired service results.

The CAM program focuses everyone in our organization on four fundamental goals:

- Providing efficient, effective and sustainable service to meet the needs of our community,
- Optimizing asset value while minimizing lifecycle costs,
- Managing risks to service delivery,
- Committing to continual improvement of the CAM program.

The CAM program is the method by which the Township will ensure sound stewardship of public assets and meet its customer service commitments to present and future citizens in an effective, efficient and sustainable manner

This asset management approach will support delivery of the Township of Muskoka Lakes' strategic objectives for sustainable infrastructure and services. The CAM program will create and maintain clear links between the broader corporate objectives, policies &strategies and the more detailed day-to-day operations / maintenance activities.

Specifically, the CAM program is committed to the following objectives:

- Customer Focused
- Provide assurance to our customers through clearly defined levels of service and adhere to optimal asset management processes and practices, including investment, that are supported by continually updated asset data and performance measures.
- Innovative

- Continually improve our asset management approach, rededicating ourselves to innovation as new tools, techniques and solutions are developed.
- Fact Based Decision Making
- Uses of a formal but flexible, consistent, and repeatable approach to cost effectively manage our infrastructure assets.
- Optimal
- Make informed decisions between competing factors such as service delivery, asset quality & value, cost and risk by determining which option will deliver the optimal lifecycle value.
- Whole Lifecycle Perspective
- Consider the full impact of managing assets through their life cycle from acquisition to disposal including level of service, risk, maintenance & operating activities and costs.
- Integrated System Focused
- Evaluate an asset in terms of its role and value within the context of the greater system, as opposed to examining individual assets in isolation.
- Forward Looking & Sustainable
- Incorporate social, legislative, environmental and financial considerations into our decisions to adequately address our present and future land use planning framework, customer service commitments, environmental stewardship and regulatory requirements.
- Regulatory Compliant
- Comply with all relevant legislative, regulatory and statutory requirements.
- Risk-based
- Direct our resources, expenditures, and priorities in a way that achieves the established levels of service & benefits at an acceptable level of risk. The Corporation will provide sufficient training and resources to enable this policy to be achieved.

SCOPE:

The asset management policy applies to all physical assets under the jurisdiction and control of the Township of Muskoka Lakes for the benefit of the residents of the township. Asset management is a broad strategic framework that encompasses many disciplines and involves all departments of the Township of Muskoka Lakes, from planning, finance, engineering, maintenance to operations. The TML Governance and Corporate Asset Management Frameworks (Appendices 1& 2) rely on key organizational strategies aligned with each other to deliver the desired outcomes.

- Strategies to manage risk, level of service and communication.
- Asset management strategies for lifecycle and data management for different asset classes.
- Planning based on optimized decision making model to report on capital, maintenance and financial plans.

The Township will also comply with the capital asset reporting requirements and integrate the CAM program throughout the Township.

The context and integration of asset management throughout the Township's lines of business will be formalized through references and linkages

between corporate documents. Where possible and appropriate, staff will consider this policy and integrate it in the development of corporate documents such as:

- Corporate strategic plan
- Corporate financial plan
- Capital budget plan
- Climate change adaptation plan
- Operational plans and budgets
- Annual reports
- Design criteria and specifications
- Infrastructure servicing, management and replacement plans

DEFINITIONS:

For the purposes of this document, the following definitions will apply consistent with the ISO 55000:2014(E) - International Standard for Asset Management and the International Infrastructure Management Manual (IIMM).

Asset – An item, thing or entity that has potential or actual value to an organization.

Asset Management (AM) – the application of sound technical, social and economic principles that consider present and future needs of users and the service/performance of the assets to guide the Township to achieve its strategic objectives. It is a combination of management, financial, economic, engineering, and other practices applied to physical assets with the objective of providing the required level of service in the most cost-effective manner at an acceptable level of risk. It involves data-driven decision-making and actions throughout the lifecycle of assets.

Corporate Asset Management (CAM) – the application of asset management practices at a corporate level to maximize consistency among the diverse asset groups and create efficiency by harmonizing service levels and business process while considering climate adaptation plans and sustainability strategies.

Corporate Asset Management Steering Committee – The Director of Finance and the Director of Public Works supported by internal staff and external consultants as required.

Strategic Asset Management Plan (SAMP) – Plan that documents and specifies how the organizational objectives are to be converted into AM objectives, the approach for developing AM plans and the role of the asset management system in supporting the achievement of AM objectives.

State of Infrastructure Report (SOIR) – Report presenting information on the asset portfolio including details of the asset inventory, valuation of the asset base (replacement value), condition/performance of the asset base, accompanied by information on supporting data.

Asset Management Plans (AMPs) – asset specific plans which are regularly updated to develop data- driven strategies and operational recommendations necessary to achieve objectives and service level expectations.

Asset Management System – a set of interrelated and interacting elements of an organization, including the AM policy, AM objectives, AM Strategy, AM Plans and the processes to achieve these objectives.

Asset Lifecycle – set of phases through the life of an asset that characterizes the ability of the asset to meet an expected level of service and retain its identity as an asset.

Lifecycle Cost – the total cost of ownership of an asset throughout its life. This may include but is not limited to capital costs, operating costs, maintenance costs, renewal costs, replacement or disposal costs, and environmental costs.

Physical Asset or Tangible Capital Asset (TCA) – Non-financial assets having physical substance that are acquired or constructed/developed and:

- Are used on a continuing basis in the Township's operations
- Have useful lives extending beyond one accounting period
- Are not held for re-sale in the ordinary course of operations

Level of Service (LOS) – The parameters or combination of parameters that reflect social, political, economic and environmental outcomes that the organization delivers. LOS statements describe the outputs or objectives an organization or activity intends to deliver to customers.

Resilience – The capacity to function, survive and thrive no matter what changes, stresses or shocks encountered.

Sustainability - Meeting the needs of today without compromising the needs of future generations. It is about maintaining or improving the standard of living by protecting human health, conserving the environment, using resources efficiently and advancing long-term economic competitiveness. It requires the integration of environmental, economic and socio-cultural priorities into policies and programs with actions at all levels.

RESPONSIBILITIES:

The Corporate Asset Management Policy shall be approved by the Council of Township of Muskoka Lakes and communicated to public through the Township's website. Responsibility for developing and implementing companion guidelines and practices and for enabling the principles of the Corporate Asset Management Policy will rest with Township Staff, as outlined in the table below.

Role	Responsibility
Identification of issues and development of policy updates	CAM Steering Committee
Exercise stewardship of assets, adopt policy and budgets	Council, Senior Management Team
Implementation of policy	Senior Management Team, CAM Steering Committee, Departments

Development of guidelines and practices	CAM Steering Committee, Departments
On-going review of policies	CAM Steering Committee

PROCEDURE:

Staff will implement the Corporate Asset Management Policy through the use of the Governance and Corporate Asset Management Frameworks together with strategies and practices.

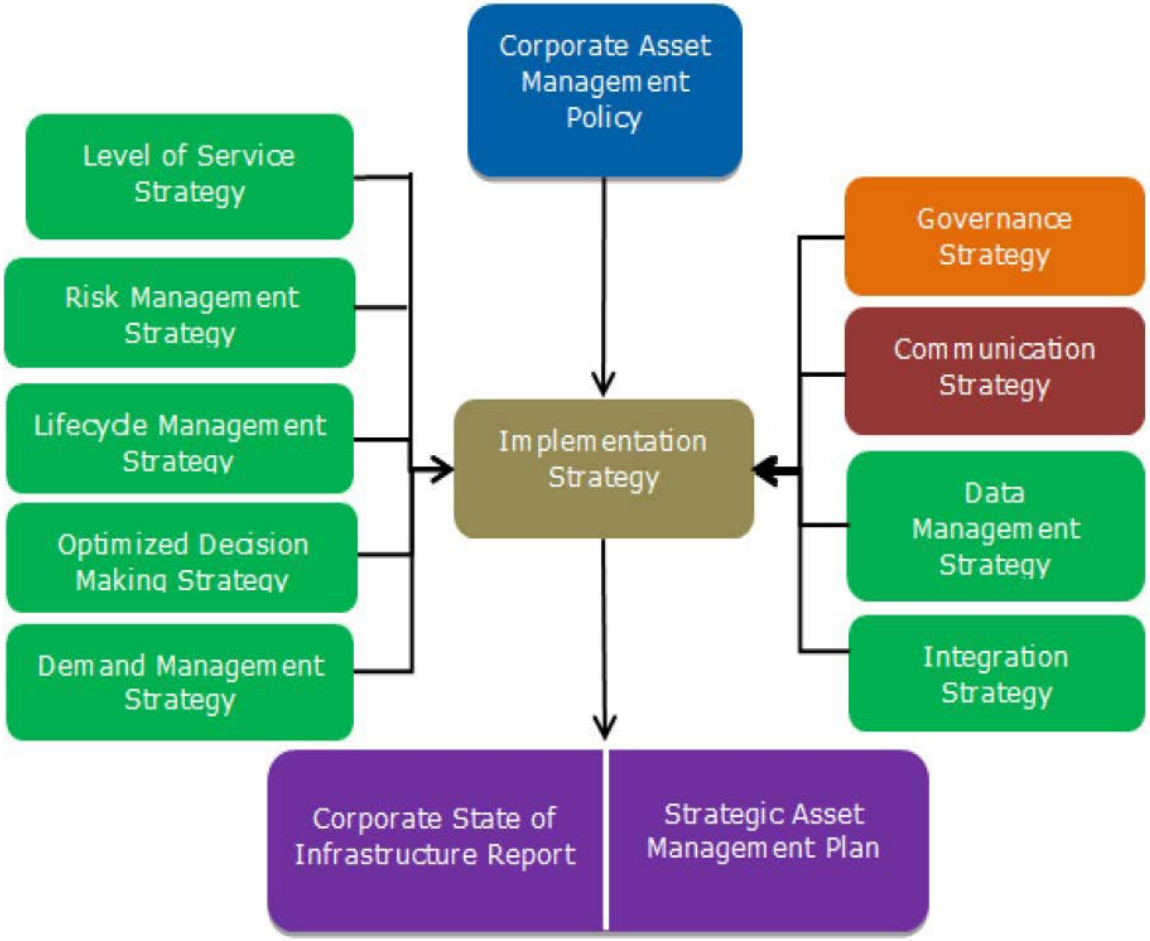
The key principles of the Asset Management Policy are outlined as follows:

- Take an optimized approach to asset related decisions, including acquisitions, disposals and trade-offs, which considers all revenues and costs (including operation, maintenance, replacement and decommissioning) and strives to minimize the total life cycle costs of assets
- Establish organizational accountability and responsibility for asset management, including for asset inventory and data management, asset condition monitoring, asset utilization and maintenance of asset performance levels
- Define and articulate asset service, maintenance and replacement levels in relation to service delivery objectives and desired Customer Service outcomes.
- Implement asset management software solutions in alignment with the Corporate Technology Strategy to document and share asset knowledge and information to provide the essential outputs for effective asset management.
- Minimize risks to asset users, and risks associated with failures.
- Integrate corporate, financial, business, technical and budgetary planning for all asset classes.
- Plan for and provide stable long term funding through the utilization of capital reserves while aligned with the long-term financial plan.
- Ensure that the Township's asset management planning process is aligned with the provincial policy statements.
- Ensure coordination with the District of Muskoka, area municipalities and other agencies for an integrated asset management system.
- Manage assets to be sustainable through the best user of available resources and the implementation of best practices.
- Integrate stakeholder input, climate change impact, environmental goals and social and sustainability objectives into a comprehensive asset management strategy.
- Utilize the Township's Public Engagement charter to fully involve/engage the public in the CAM process.
- Report on the performance of the CAM program for review and approval by Council.

This policy shall be implemented by staff to meet the requirements of O.Reg.588 /17: Asset Management Planning in Municipal Infrastructure regulation, using accepted industry guidelines and practices such as Ontario Building together – Guide for municipal asset management plans, the ISO 55000:2014(E) - International Standard for Asset Management and the International Infrastructure Management Manual (IIMM, 2015). These guidelines shall form the basis for the Township's SAMP and AMPs.

Asset management plans will be developed for specific asset classes and will outline long term goals, processes and steps toward how they will be achieved. The AMPs will be based on current inventories and condition (acquired or derived), projected asset performance and remaining service life and risk consequences of losses. The plans will reflect details, such as replacement portfolios and associated financial plans while considering alternative scenarios and risks.

APPENDIX 1 GOVERNANCE FRAMEWORK



APPENDIX 2

CORPORATE ASSET MANAGEMENT FRAMEWORK