Appendix I

Executive Summary

E.1 Introduction

The Township of Muskoka Lakes is a vibrant community with a permanent population of 7,200 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 $600 million dollars, or about $91,000 per Muskoka Lakes resident. The Township of Muskoka Lakes' 2023 Asset Management Plan is the first all encompassing 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 Asset Management Report Card

Each asset system or grouping is rated considering two key dimensions:

- Condition of the assets relative to the performance of the asset group; and
- The level of funding provided to the asset group relative to the value of the needs within the group.

The scores in each of these dimensions once combined evaluates the Townships performance in managing its infrastructure. The dimensions are described in greater detail in the following sections.

Overall the Township receives a rating of D+ for the management of its physical infrastructure. While the organization has done a commendable job in terms of maintaining the condition of its assets, underfunding of needs is a serious problem resulting in significant accumulations of deferred capital investments. Failure to address the situation will have serious level of service consequences for the Township in the not too distant future particularly in the area of public buildings, recreation facilities, and transportation infrastructure.

Table 1 Consolidated Asset Management Report Card

Asset System	Asset Category	Condition vs Performance	Funding vs Need	Combined Rating
Administrative Facilities	Civic Bldgs	B-	F	C-
Culture, Sports, and Recreation	Cultural Recreation and Sport Facilities	B-	F	C-
Emergency	Fire Bldgs and Equip.	B-	B-	B-
Information Technology	Hardware and Software	B	A+	A-
Parking	On and Off Street Parking	F	D-	F
Transportation	Bridges and Roads	D+	F	D
Vehicles and Equipment	Vehicles and Equipment	C	C	C
	Overall Rating	C-	F	D+

E.3 State of the Assets

The state of the assets report card provides a quantitative assessment of the asset portfolio in terms of overall replacement value and estimated remaining life. **Table 2** provides an overview of the replacement value and ratings of Township-owned assets. Overall, the Township's asset portfolio has approximately 54 per cent remaining service life, which is considered to be in the fair rating category. Of the portfolio, approximately 11.3 per cent, or $70.1 M in assets, have below 45 per cent remaining service life. Of this amount approximately $149.3 million are beyond their typical service lives.

Table 2 Asset System Ratings Based on Service Life and Condition

Asset System	Asset Category	Asset	Replacement Cost	% Life Remain	Condition State	% of Assets Poor or Very Poor	Replace Value Poor and Very Poor Assets
Administrative Facilities	Civic	Admin Building	$12,229,000	34.2%	Poor	11.7%	$1,432,037
	Medical	Health Hub	$2,232,600	68.1%	Good	0.0%	-
	Works Yards	Garages, Sand, Salt Sheds	$12,438,900	40.5%	Poor	7.7%	$955,846
Culture, Sports, and Recreation	Cultural Facilities	Cemeteries	$88,300	41.3%	Poor	0.0%	-
		Community Centres	$45,859,000	33.8%	Poor	4.6%	$2,156,274
		Docks and Wharves	$6,240,000	31.9%	Poor	22.0%	$1,370,393
		Library	$7,215,500	26.7%	V Poor	0.0%	-
	Recreation Facilities	Parks	$11,767,000	78.6%	Good	0.2%	$22,190
		Parks Buildings	$2,933,500	35.4%	Poor	4.6%	$93,628
		Trails	$728,000	49.7%	Fair	0.0%	-
	Sports Facilities	Arenas	$29,464,800	5.4%	V Poor	5.8%	$1,720,793
		Sport Fields Etc	$1,545,500	28.2%	V Poor	3.2%	$50,110
Emergency Services	Fire	Fire Halls	$25,758,800	33.5%	Poor	4.4%	$1,134,584
		Fire Vehicles & Equipment	$10,969,000	45.7%	Fair	0.0%	-
Information Technology	Hardware Network	Computers, Peripherals	$773,400	40.2%	Poor	37.4%	$289,582
		Connectivity / WiFi	$ 85,700	2.6%	V Poor	99.1%	$84,953
	Software	Operational	$445,500	55.4%	Fair	22.4%	$120,000
Parking	Surface Parking	Parking Lots	$407,100	38.1%	Poor	4.5%	$18,400
		Street Parking	$430,900	0.7%	V Poor	92.8%	$399,900
Storm Water Manage-ment	Drainage Systems	Rural	$41,703,000	28.6%	V Poor	0%	$0
		Urban	$4,058,500	54.5%	Fair	0%	$0
		Dam	$7,325,000	0.0%	V Poor	100%	$7,325,000
Transportation	Bridges and Culverts	Bridge	$19,775,000	47.7%	Fair	17.8%	$3,512,500
		Culverts (>3.0m)	$5,567,500	45.4%	Fair	27.1%	$1,510,000

	Roads	Hard Top	$236,612,000	70.5%	Good	40.3%	$30,500,900
		Loose Top	$119,900,700	67.5%	Good	53.2%	$14,984,100
	Railway Crossings	Protected	$600,000	48.3%	Fair	0.0%	-
		Unprotected	$100,000	25.0%	V Poor	0.0%	-
	Sidewalks	Concrete	$400,400	35.6%	Poor	0.6%	$2,429
		Pavers	$48,300	26.5%	V Poor	0.0%	-
	Signs	Informational	$124,800	46.9%	Fair	3.2%	$1,200
		Regulatory	$255,000	29.3%	V Poor	6.0%	$15,300
		Warning	$156,600	18.2%	V Poor	53.6%	$84,000
	Street Lighting	LED	$548,300	76.3%	Good	0.0%	-
		INC	$8,000	30.0%	Poor	0.0%	-
		Poles	$1,425,000	52.5%	Fair	0.0%	-
Vehicles and Equipment		Vehicles and Equipment	$ 9,990,500	36.3%	Poor	24.3%	$2,432,000
		Total	**$620,211,100**	**54.2%**	**Fair**	**11.3%**	**$70,129,226**

It should be noted, that the estimates of remaining lives and rating categories do not necessarily mean that the assets are insufficiently providing 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.4 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 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. This will be accomplished through the completion of proposed levels of service study to be completed in 2024. Tools and techniques will be developed to predictively model levels of service over time.

E.5 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:

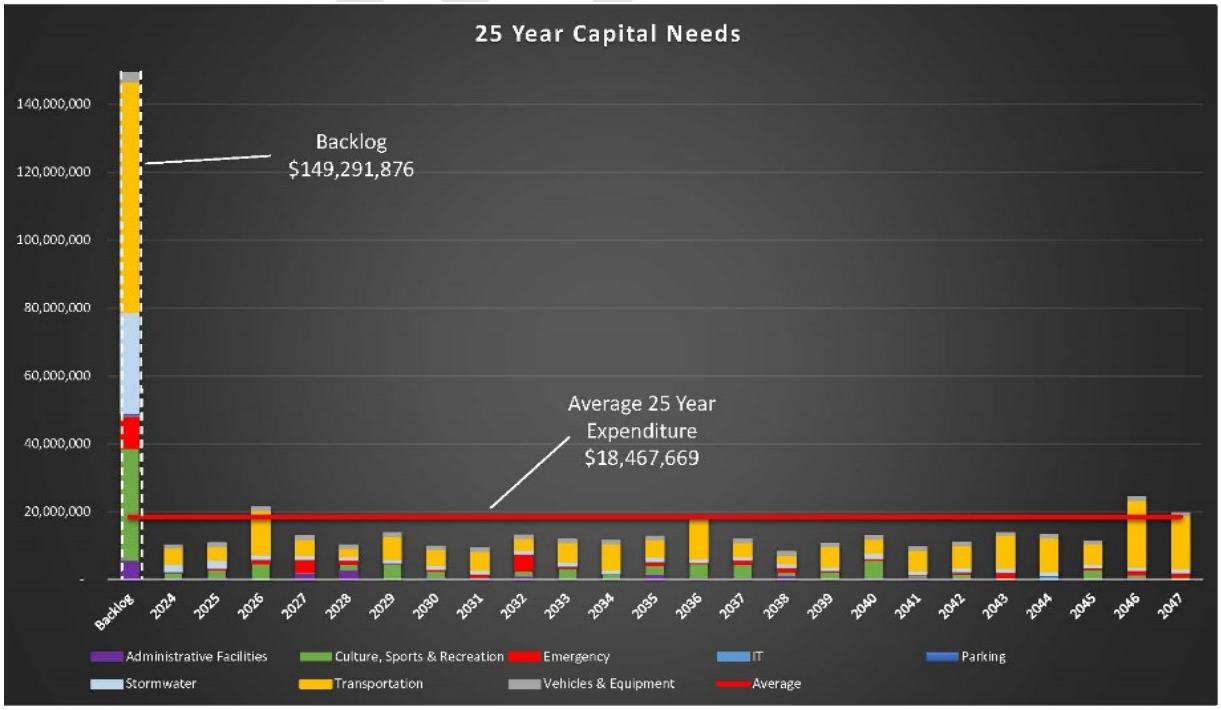
- **Non-infrastructure solutions**: Actions or policies that can lower costs or extend asset life (e.g., better integrated infrastructure planning and land use planning, demand management, insurance, process optimization, managed failures).
- **Maintenance activities**: Including regularly scheduled 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 previously un-serviced areas – or to expand services to meet growth demands.

E.6 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 seen in the post war years in Canada, 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 dramatically 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. A minimum of 80 years and preferably 100 years is recommended.

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

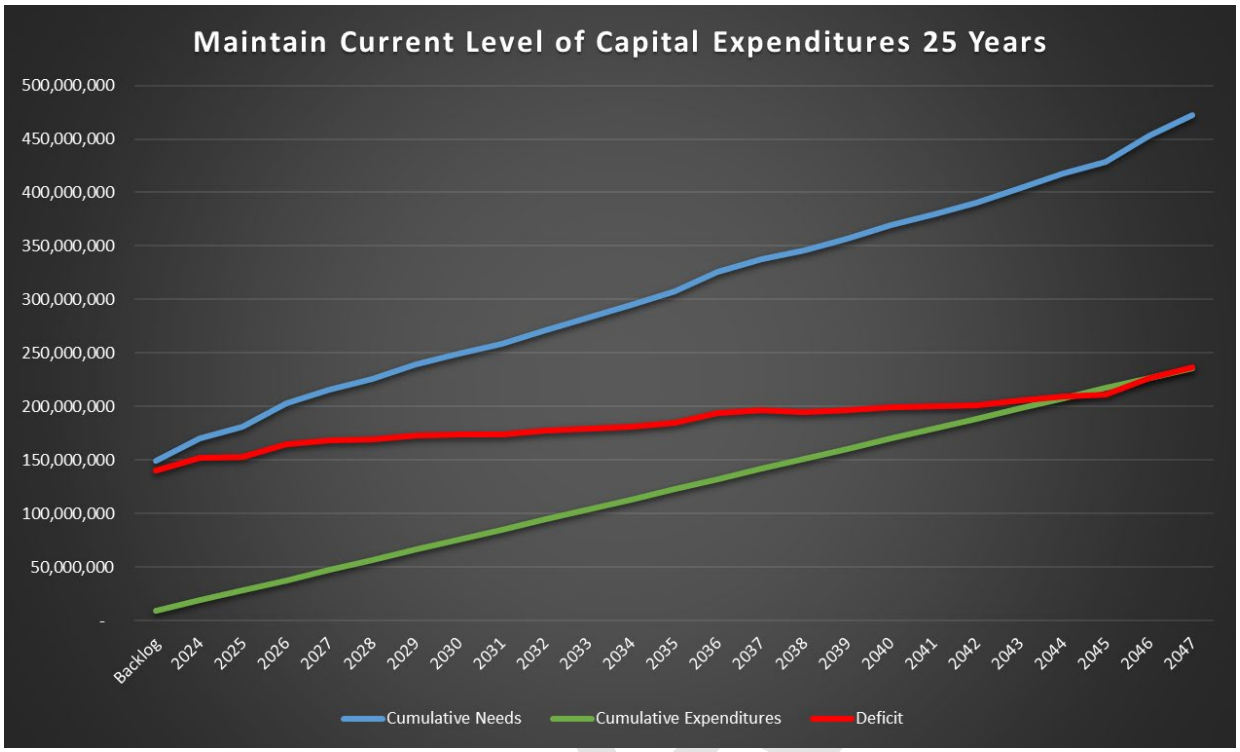
Figure 1. 25 Year Lifecycle Investment Requirements



As can be seen from the figure, the current backlog of needs is approximately $149.4 M and average annual capital cost of $18.5 M is forecasted to be required over the 25-year period in order to keep pace with the rate of deterioration.

Figure 2 provides the cumulative 25 year forecast expenditures for core asset systems ($460.2 M) and the corresponding cumulative revenues ($236.0 M) based on current levels of expenditure. Under this scenario the backlog of needs the backlog of needs can be expected to grow to $224.2 M in current year dollars.

Figure 2. 25 Year Cumulative Capital Investments vs. Revenues



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.

E.7 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 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 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.

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 7,200 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. 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 required that all municipalities adopt a strategic asset management policy by July 1, 2019. Secondly, the regulation required 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 infrastructure under its control. The plan is required to be expanded to include all infrastructure under its control by July 1, 2024. Finally the Township must amend its asset management plan by July 1, 2025 to include the levels of service to be delivered by the Township for each asset category covered by the plan and to include a financial plan to demonstrate how the levels of service are to be funded.

1.2.2 Township of Muskoka Lakes Responses

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, through its enaction of the very prescriptive Ontario Regulation 588/17: Asset Management Planning for Municipal Infrastructure established standards for asset management plans. The regulation requires that municipalities adopt an asset management policy by 2019 and to work towards putting in place a comprehensive plan manage and sustain all assets by 2025 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 was to develop a plan that addresses core assets by the July, 2022 deadline. This was accomplished in accordance with the provincial directive. 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 intent of the plan is to provide Council with the best available information so that it can start to make more 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

An early objective was the adoption of the Asset Management Policy. Township of Muskoka Lakes Policy C-FS-13 reflects advances in best practices for asset management. The Policy is included in **Appendix I** and details the principles and general framework for a consistent and coordinated approach to asset management in order to achieve the organization'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 completed its strategic planning initiative which set the direction for the balance of the term of Council and into the term of the next 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 accomplish 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 the 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 our 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.

These will be achieved through the plan.

1.4 Purpose of the Asset Management Plan

This Asset Management Plan will set 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 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.
- Provide increased transparency related to the Township's asset management practices, challenges and opportunities.

The Plan provides a baseline for the following initiatives for 2023 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

The plan addresses the needs of all of the assets under the control of the Township including:

- Administrative Facilities
- Culture, Recreation and Sports Facilities
- Emergency Services Infrastructure
- Information Technology
- Libraries
- Parking
- Transportation Infrastructure
- Vehicles and Equipment

Although not included in the current version of the plan, future editions should also consider additional assets including:

- Digital and non-digital records
- Ecological/Environmental assets on municipal properties

1.6 Duration and Updates to the Plan

Traditional capital forecasting at the Township has been based on five and more recently ten year projections. This duration is acceptable at a tactical level but in order to be effective, 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 under Township management have life expectancies that span decades and therefore a 100 year timeframe is desirable to ensure that the complete lifespan of each asset is captured. This should be the objective.

The completion of such a long term requires a firm understanding of the required levels of service which will not be addressed until the latter half of 2024. As an interim step the term of the plan has been expanded to 25 years. This will provide a more strategic view of asset planning until the longer range plan becomes available.

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 four to 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 the plan. This process will be further refined in future iterations. 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

The Asset Management Plan was developed by the Public Works Department in conjunction the other departments within the Township organization and forms part of a broader asset management work plan that began in 2014. The development of this initial plan primarily included data collection, compiling data from multiple inventories and sources and developing analyses of the accumulated data. This plan builds and expands on the work of the initial plan The key tasks of the most recent initiative were:

1. **State of the Assets**
   - Background data collection
   - Develop initial condition estimates
   - Develop replacement costs
   - Create the asset management plan template, and analyze and summarize data
2. **Levels of Service**
   - Identify current levels of service by group
   - Identify current regulations by group
3. **Asset Management Strategy**
   - Document current decision making strategies and business processes
   - Document O&M, rehabilitation, and replacement strategies
   - Document capital planning process
4. **Financial Management Strategy**
   - Document sustainable funding levels
   - Document financing and funding strategies
5. **Draft Asset Management Plan**
   - Draft Development
   - Submit to SLT for review
   - Address Comments

6. **Final Asset Management Plan**
   - Incorporate revisions and development of a draft Asset Management Plan
   - Present final Plan to Committee for review and comment
   - Council adoption of the final Asset Management Plan
   - 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 draft and final plan. ▪ Address comments. ▪ Present and publish the final plan.
SLT	▪ Provide direction to the overall asset management work plan. ▪ Support the development of the asset management plan through ensuring staff availability where required. ▪ Review and provide comment on the draft asset management plan. ▪ Approve 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. ▪ Review the draft asset management plan.
General and FinanceCommittee	▪ Review and endorse the final asset management plan for publication.
Township Council	▪ Approve the final asset management plan.

1.7.3 Limitations

The Asset Management Plan was developed based on the best available information making assumptions using and 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 eachcomponent.
- 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, some limitations were encountered as the Plan was developed. These are as follows:

- 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 implementation of the City Works System has started the process and basic information is available. This will improve with time. In the interim 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 have been significant gaps in inventory and condition information. Many of these gaps have been closed but further effort will be 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 informal enterprise risk management framework. This needs to be expanded upon and formally adopted by Council.
- The Township does not addresses 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.

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 Asset Management Program evolves.

1.8 Evaluation and Improvement

This document is the next step in the Township's transition to a comprehensive approach to asset management and provides a high-level overview of the asset management program at a corporate level. The document is simply the tip of the iceberg and will be developed and improved 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.

2 State of the Assets

The state of the assets report card provides a quantitative assessment of the asset portfolio in terms of overall value and estimated remaining life.

The primary objective of the report card is to provide high-level insights into the overall age and condition of the asset portfolio based on typical asset lifecycles. Where actual condition assessment data exists, it has been incorporated to provide the most accurate insights possible based on available data. When reviewing the results that are presented, it is important to bear in mind the confidence in the data. In some cases, where condition, age or cost data does not exist, professional judgment has been used to provide the fullest picture possible. To assist the reader, as well as the Township in 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, asset report cards are 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 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.

This asset report card:

- 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.
- 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 systems as shown in **Table 4**. Though not shown in the table, the asset classes 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 4. Asset Inventory Classification

Asset System	Asset Category	Asset	Count	Size/ Area	Unit
Administrative Facilities	Civic	Admin Building	1	17,528	Sq ft
	Medical	Health Hub	1	3200	Sq ft
	Works Yards	Garages, Sand, Salt Sheds	4	30,054	Sq ft
Culture, Sports, and Recreation	Cultural Facilities	Cemeteries	12	8814	Plots
		Community Centres	14	68,550	Sq ft
		Docks and Wharves	42	-	Ea
		Library	1	7500	Sq ft
		Parks	17	TBD	Ha
		Public Washrooms	9	5703	Sq ft
		Pavilions	4	6172	Sq Ft
		Trails	6	10.5	Km
	Sports	Arenas	2	51,437	Sq ft
		Golf Course	1	9	Holes
		Sport Parks	2	17	Acres
		Tennis Courts	2	520	Sq m
Emergency	Fire	Fire Halls	11	28,286	Sq ft
		Fire Equipment	17	-	Ea
		Fire Vehicles	10	-	Ea
Information Technology	Hardware	Computers, Peripherals	930	-	Ea
	Network	Connectivity / WiFi	28	-	Ea
	Records	Digital	TBD*	-	Ea
	Software	Operational	13	-	Ea
Parking	Surface Parking	Parking Lots	177	-	stalls
		Street Parking	139	-	stalls
Storm Water Management	Drainage Systems	Rural	-	649.59	km
		Urban	-	2422	m
		Dam	1	59	m
Transportation	Bridges and Culverts	Bridge	13	1582	Sq m
		Culverts (>3.0m)	8	1013	Sq m
	Roads^	Hard Top	324	222.74	Km
		Loose Top	156	133.32	Km
	Railway Crossings	Protected	3	-	Ea
		Unprotected	2	-	Ea
	Sidewalks	Concrete	-	2002	m
		Pavers	-	1201	m
	Signs	Informational	416	72.8	Sq m
		Regulatory	850	269.4	Sq m
		Warning	522	152.5	Sq m
		LED	443	-	Ea

	Streetlighting	INC	3	-	Ea
		Poles	129	-	Ea
Vehicles and Equipment	Equipment	Attachments	33	-	Ea
		Fuel System	3	D-31,400/ G-9,000	Ea
		Heavy Equipment	9	-	Ea
		Light Equipment	39	-	Ea
		Medium Equipment	10	-	Ea
		Tools & Small Equipment	66	-	Ea
	Vehicles	Heavy Duty Vehicle	12	-	Ea
		Light Duty vehicle	18	-	Ea
		Medium Duty Vehicle	8	-	Ea

* *To be determined: The data is currently unavailable; placeholders have been included to be potentially populated in future iterations of the Corporate Asset Management Plan.*

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

The Township was amalgamated in January 1971 and is made up of several former townships including the Township of Cardwell, the Township of Watt, the United Townships of Medora and Wood, a portion of the former Township of Monck, the Town of Bala, the Village of Port Carling and the Village of Windermere. Given this background it is not surprising to note that the amount of infrastructure under Township jurisdiction is significantly more than would be expected given the scope and size of the Township's responsibilities.

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:

- **The 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 5,** and indicates the following:

- The accumulated amortization is approximately $75,807,149 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 $60,873,786.

Table 5. Muskoka Lakes 2022 FIR Values

Asset Group	2022 Opening Cost Balance	2022 Accumulated Amortization	2022 Closing Net Book Value	Life Remaining (%)
Administration				
Administrative Facilities	11,723,494	1,814,680	9,908,814	84%
Health Hub	1,877,980	306,152	1,571,828	84%
Subtotal	13,601,474	2,120,832	11,480,642	84%
Recreation and Cultural Services				
Cemeteries	536,357	386,555	149,802	28%
Libraries & Cultural Services	3,157,075	1,795,494	1,361,581	43%
Parks	12,103,075	7,479,033	4,624,042	38%
Recreational Facilities	10,655,683	6,975,857	3,679,826	35%
Subtotal	26,452,190	16,636,939	9,815,251	39%
Emergency Services				
Fire	15,875,808	7,812,940	8,062,868	51%
Building Permit & Inspection Services	447,075	278,815	168,260	38%
Subtotal	16,322,883	8,091,755	8,231,128	50%
Transportation Services				
Roads	65,629,573	42,770,995	22,858,578	35%
Bridges and Culverts	10,703,116	3,846,159	6,856,957	62%
Roads- Traffic Operations	3,971,699	2,340,469	1,631,230	41%
Subtotal	80,304,388	48,957,623	31,346,765	38%
Total Tangible Capital Assets	136,680,935	75,807,149	60,873,786	45%

Financial accounting valuation is completed on an annual basis at the Township of Muskoka Lakes to meet financial reporting requirements of the Ministry of Municipal Affairs and Housing. It is not however, 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 service 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 2022 dollars. Several methods were used to estimate the replacement costs of the assets, including:

- **Tender pricing and recent unit costs:** Based upon recent closed tender pricing, which provides an accurate perspective of the anticipated cost to replace a similar asset.
- **Condition assessment replacement costs:** 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 were available, industry cost indices were used

such as Altus Group Canadian Costing Guide (2023) and Hanscomb (2023) Yardsticks for Costing: Cost Data for the Canadian Construction Industry.

- **Inflated historic costs:** When none of the above was available, the historic cost was inflated to present day dollars using the Non-Residential Building Construction Price Index [2]

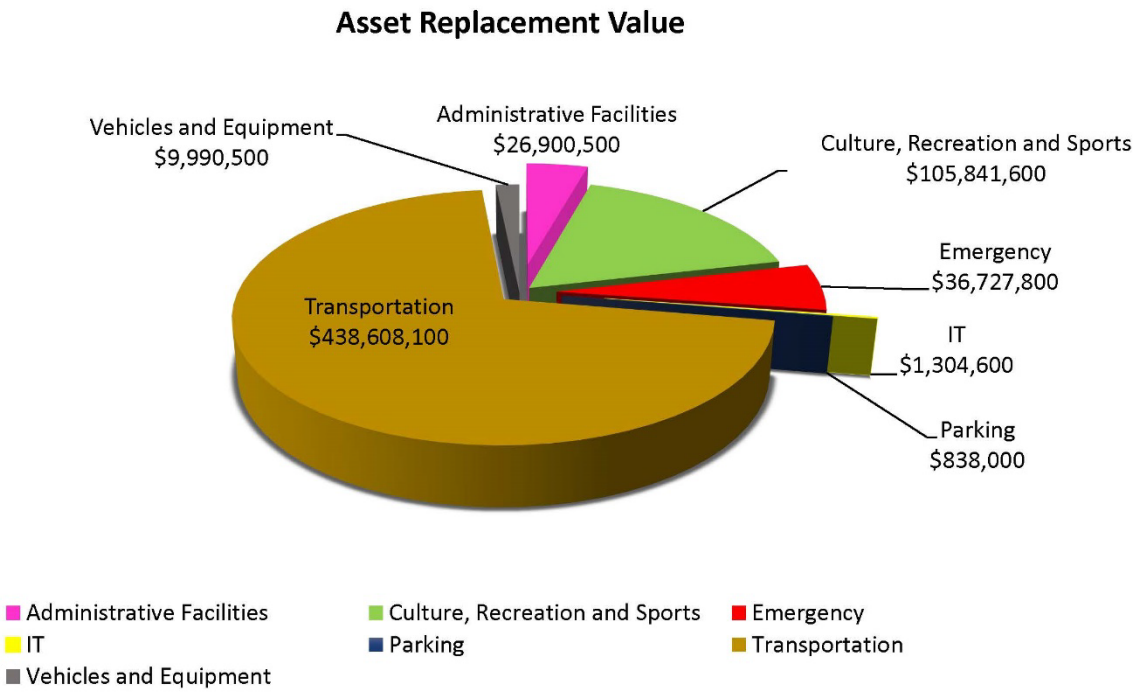
Table 6 provides the estimated replacement value of the Township's asset inventory across the asset classes. The total replacement value of the Township's entire portfolio is estimated to be approximately $620 million in 2022 dollars. This is the estimated cost that would be incurred if the Township were to replace all of its assets in their current configuration. 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 townships assets do not conform to current standards and any replacement would be required to be in compliance with current codes of practice and standards. As a consequence actual construction costs may be significantly higher. It should be noted that land costs are not included in assets replacement costs for facilities but are included in assets where the main value is the land (trails, sports fields).

Table 6. Replacement Costs

Asset System	Asset Category	Asset	Replacement Cost
Administrative Facilities	Civic	Admin Building	$12,229,000
	Medical	Health Hub	$2,232,600
	Works Yards	Garages, Sand, Salt Sheds	$12,438,900
Culture, Sports, and Recreation	Cultural Facilities	Cemeteries	$88,300
		Community Centres	$45,859,000
		Library	$7,215,500
	Recreation Facilities	Docks and Wharves	$6,240,000
		Parks	$11,767,000
		Parks Buildings	$2,933,500
		Trails	$728,000
	Sports	Arenas	$29,464,800
		Sports Fields Etc	$1,545,500
Emergency	Fire	Fire Halls	$25,758,800
		Fire Equipment	$10,969,000
Information Technology	Hardware	Computers, Peripherals	$773,400
	Network	Connectivity / WiFi	$85,700
	Records	Digital	TBD
	Software	Operational	$445,500
Parking	Surface Parking	Parking Lots	$407,100
		Street Parking	$430,900
Storm Water Management	Drainage Systems	Rural	$41,703,000
		Urban	$4,058,500
		Dam	$7,325,000
Transportation	Bridges and Culverts	Bridge	$19,775,000
		Culverts (>3.0m)	$5,567,500
	Roads	Hard Top	$236,612,000
		Loose Top	$119,900,700
	Railway Crossings	Protected	$600,000
		Unprotected	$100,000
	Sidewalks	Concrete	$400,400
		Pavers	$48,300
	Signs	Informational	$124,800
		Regulatory	$255,000
		Warning	$156,600
		LED	$548,300

	Streetlighting	INC	$8,000
		Poles	$1,425,000
Vehicles and Equipment	Public Works Fleet	Vehicles and Equipment	$9,990,500
		Total	**$620,211,100**

Figure 4. Asset Replacement Value



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].*

Clearly the Township's transportation assets represents the largest single investment with an estimated replacement value of just over $439 M or 71% of all assets. Within this asset class roads represents $356 M or 81% of the value of the assets in that category. Next in the order of significance at 17% is the Township's culture parks and recreation asset class with an estimated value of $106 M. Within this class of assets community centres are the largest component with an estimated value of $46 M or 43% of the total within the asset class. The remaining assets representing 13% of the value of assets under township control. While they are a comparatively small portion of the total, they are not insignificant in terms of their value at approximately $76 M.

2.3 Asset Age Distribution

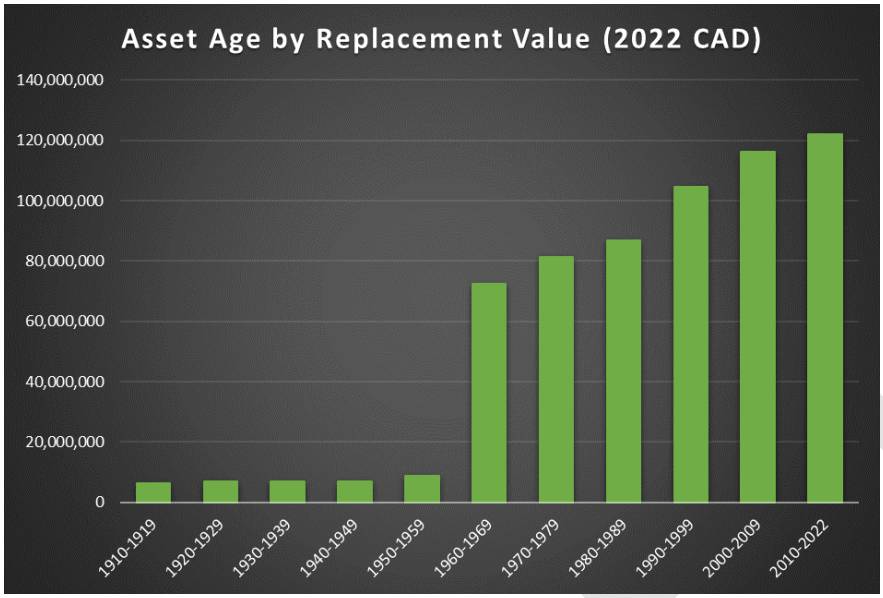
An asset's estimated service life is the period of time that it is expected to be of use and fully functional to the Township of Muskoka Lakes. For the purposes of this analysis, unless condition and performance data exists, once an asset has reached the end of its service life, it has been deemed to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

Table 7. Useful Life of Assets

Asset	Asset Component	Useful Life
Buildings	Architectural	15-40
	Electrical	20
	Mechanical	15-20
	Structural	60-80
Fixtures and Furniture	All	5-15
Land Improvements	Cemeteries	50-100
	Docks	20-50
	Facility Grounds	20-40
	Parking Lots	20
	Parks	15-30
Library	Collections	5-15
Machinery and Small Equipment	Arena	5-20
	Fire	10-15
	IT	3-15
	Library	5-15
	Parks and Rec	5-15
Stormwater	Catch Basins / Manholes	40-80
	Ditches	10-20
	Ponds	20-30
	Storm Sewers	80-100
	Dam	80-100
Transportation	Bridges	80-100
	Culverts	20-40
	Roads Surface	10-20
	Roads Base	20-40
	Sidewalks	20-40
	Signs	5-15
	Streetlights	15-25
Vehicles and Heavy Equipment	Light Duty	5-7
	Medium Duty	5-10
	Heavy Duty	10-15

Figure 5 summarizes the theoretical year of installation by replacement value for the asset portfolio by decade.

Figure 5. Muskoka Lakes Asset Age Distribution by Replacement Value (2022 CAD)



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

2.4 Remaining Service

Using the estimated service life, and knowing the age of the asset it is possible to determine the theoretical remaining life of the asset. The remaining life is a useful indicator of the state of the assets and can be reflective of the condition of the asset. Using the rubric identified in Table 8 below the remaining life is converted into physical condition data and can be used to give a general assessment of the condition of the group of assets.

Table 8. Rating Categories Based on Service Life and Condition

Condition State	Percent of Remaining Service Life	Definition
Very Good	80% - 100%	**Fit for the Future** - The assets in the system is generally in very good condition, typically new or recently rehabilitated.
Good	65% - 79%	**Adequate for Now** - Some assets elements show general signs of deterioration that require attention. A few elements exhibit deficiencies
Fair	45% - 64%	**Requires Attention** – The assets in the system shows general signs of deterioration and require attention with some elements exhibiting significant deficiencies. Rehabilitation is required
Poor	30% - 45%	**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. Run to failure and reconstruction is the only viable option.
Very Poor	<30%	**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.

In terms of process the remaining life is calculated for each asset within an asset category and these are converted to one of five condition ratings ranging from very good to very poor. Using the respective replacement costs, a weighted average remaining life score was computed for each asset category. 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.

Understanding the percentage remaining life for each of the asset systems 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 subsequent 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, one can diagnose and evaluate the impacts of such a scenario.

Table 9 provides an overview of the condition rating of Township-owned assets, categorized into each asset system based on remaining service life. 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 55 per cent remaining service life. Of the portfolio, approximately 11 per cent or $70,016,100 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 9. Asset System Ratings Based on Service Life and Condition

Asset System	Asset Category	Asset	Replacement Cost	Remaining Value	% Life Remain	Condition State	% of Assets Poor or Very Poor	Poor and Very Poor Replace Value
Administrative Facilities	Civic	Admin Building	$12,229,000	$4,178,209	34.2%	Poor	11.7%	$1,432,037
	Medical	Health Hub	$2,232,600	$1,519,351	68.1%	Good	0.0%	-
	Works Yards	Garages, Sand, Salt Sheds	$12,438,900	$5,033,979	40.5%	Poor	7.7%	$955,846
Culture, Sports, and Recreation	Cultural Facilities	Cemeteries	$88,300	$36,448	41.3%	Poor	0.0%	-
		Community Centres	$45,859,000	$15,504,843	33.8%	Poor	4.6%	$2,156,274
		Docks and Wharves	$6,240,000	$1,993,512	31.9%	Poor	22.0%	$1,370,393
		Library	$7,215,500	$1,927,185	26.7%	V Poor	0.0%	-
	Recreation Facilities	Parks	$11,767,000	$9,245,400	78.6%	Good	0.2%	$22,190
		Parks Buildings	$2,933,500	$1,037,000	35.4%	Poor	4.6%	$93,628
		Trails	$728,000	$175,000	49.7%	Fair	0.0%	-
	Sports Facilities	Arenas	$29,464,800	$1,592,300	5.4%	V Poor	5.8%	$1,720,793
		Sport Fields Etc	$1,545,500	$435,400	28.2%	V Poor	3.2%	$50,110
	Fire	Fire Halls	$25,758,800	$8,639,200	33.5%	Poor	4.4%	$1,134,584

Emergency Services		Fire Vehicles & Equipment	$10,969,000	$5,013,700	45.7%	Fair	0.0%	-
Information Technology	Hardware Network	Computers, Peripherals	$773,400	$310,600	40.2%	Poor	37.4%	$289,582
		Connectivity / WiFi	$ 85,700	$2,200	2.6%	V Poor	99.1%	$84,953
	Software	Operational	$445,500	$246,900	55.4%	Fair	22.4%	$120,000
Parking	Surface Parking	Parking Lots	$407,100	$155,000	38.1%	Poor	4.5%	$18,400
		Street Parking	$430,900	$3,100	0.7%	V Poor	92.8%	$399,900
Storm Water Management	Drainage Systems	Rural	$41,703,000	$11,935,000	28.6%	V Poor	0%	$0
		Urban	$4,058,500	$2,211,100	54.5%	Fair	0%	$0
		Dam	$7,325,000	$0	0.0%	V Poor	100%	$7,325,000
Transportation	Bridges and Culverts	Bridge	$19,775,000	$9,424,219	47.7%	Fair	17.8%	$3,512,500
		Culverts (>3.0m)	$5,567,500	$2,530,000	45.4%	Fair	27.1%	$1,510,000
	Roads	Hard Top	$236,612,000	$166,711,024	70.5%	Good	40.3%	$30,500,900
		Loose Top	$119,900,700	$80,873,100	67.5%	Good	53.2%	$14,984,100
	Railway Crossings	Protected	$600,000	$290,000	48.3%	Fair	0.0%	-
		Unprotected	$100,000	$25,000	25.0%	V Poor	0.0%	-
	Sidewalks	Concrete	$400,400	$142,500	35.6%	Poor	0.6%	$2,429
		Pavers	$48,300	$12,800	26.5%	V Poor	0.0%	-
	Signs	Informational	$124,800	$58,500	46.9%	Fair	3.2%	$1,200
		Regulatory	$255,000	$74,700	29.3%	V Poor	6.0%	$15,300
		Warning	$156,600	$28,500	18.2%	V Poor	53.6%	$84,000
	Street Lighting	LED	$548,300	$418,100	76.3%	Good	0.0%	-
		INC	$8,000	$2,400	30.0%	Poor	0.0%	-
		Poles	$1,425,000	$747,500	52.5%	Fair	0.0%	-
Vehicles and Equipment		Vehicles and Equipment	$ 9,990,500	$3,626,800	36.3%	Poor	24.3%	$2,432,000
		Total	**$620,211,100**	**$336,160,570**	**54.2%**	**Fair**	**11.3%**	**$70,129,226**

Figure 6 summarizes the replacement value of assets within each of the condition rating categories. Presently, approximately 11 percent of Muskoka Lakes' overall asset portfolio is in poor and very poor condition.

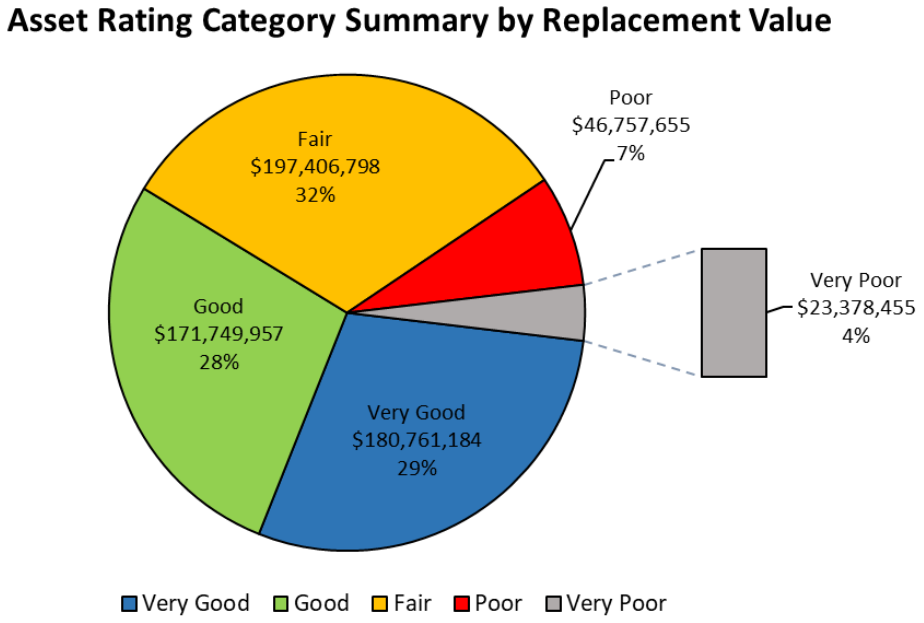
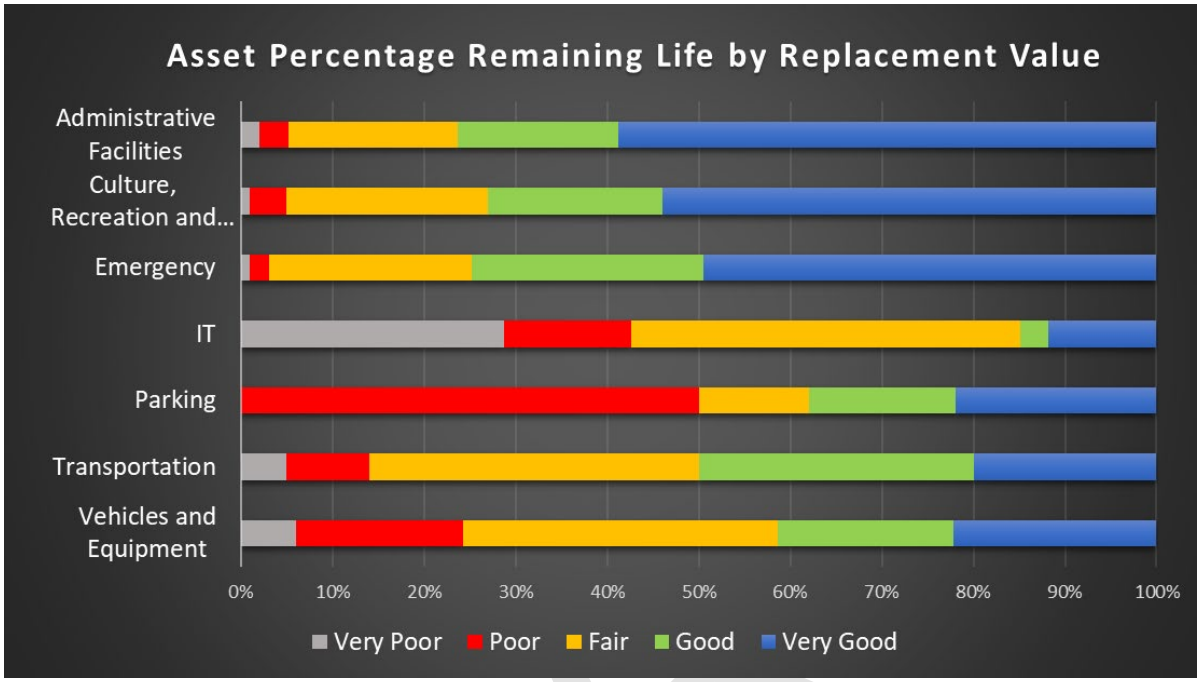


Figure 7 shows the breakdown of assets by rating category for each of the asset systems.

Figure 7. Asset Percentage Remaining Life by Replacement Value



As can be seen from **Table 9,** the weighted average remaining service life for the Township's asset portfolio falls is estimated to be approximately 54% 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 buildings had building condition audits last completed in 2021 and 2022. These reports should be updated at least every five years in order that their true condition is accurately reflected in future reports.

The value of the assets with an estimated remaining service life below 45% amounts to approximately $66.4 M. This equates to the value of assets in poor or worse condition and in need of replacement. This should be considered the backlog of immediate needs for replacement within the asset portfolio.

2.5 Current Asset Condition Assessment Practices

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.
- **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 10 provides an overview of the current state of general condition assessments, as well as recommendations to move towards asset management best practice.

Table 10. Summary of Current Condition Assessment Practices

Asset System	Condition Assessment Comment
Administrative Facilities	Completed in conjunction with the update of the AMP. Detailed condition assessment recommended every five years. Data partially entered into GIS/AMS
Culture, Sports and Recreation	Completed in conjunction with the update of the AMP. Detailed condition assessment recommended one to three years depending on the asset and in no case less frequently that every five years. Data partially entered into GIS/AMS. Parks and Recreation Master Plan is currently underway. P&RMP update recommended ideally every five years and no longer than every ten years
Emergency	Condition assessments every two to five years (fleet and most equipment) Partially entered into GIS/AMS. Fire Master Plan update currently in process. Recommended updates every five years
Parking	Completed in conjunction with the update of the AMP. Condition assessment recommended every five years. Available data partially entered into the GIS. Features and condition data outstanding
Stormwater	Condition assessments have not been completed since construction. Condition assessments recommended every five years. Available data entered in GIS/AMS
Transportation	Bridges and structures condition assessments required every two years in accordance with the Ontario Structure Inspection Manual. Last update in 2021. Note some retaining walls and outlet structures have been inspected, however a full inventory and condition assessment program should be developed. Data in spreadsheets. Requires uploading in GIS/AMS Public road network assessed every two years. Last update in 2020. Unmaintained and private roads on public lands not included. To be included in 2022 update. 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 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 completed in 2018. Data entered in GIS/AMS. A Transportation Master Plan is recommended every ten years. Scheduled for completion in 2022
Vehicles and Equipment	Annual assessment at time of recertification. Data is not currently included in GIS/AMS.

2.6 Condition vs Performance

The Township uses a variety of investigative techniques to determine and track the physical condition of its infrastructure. In the case of roads and bridges, each asset is condition rated in accordance with approved methodologies established by MTO. For storm water pipes, they are regularly inspected using CCTV (closed circuit television). These inspections are guided by standard principals of defect coding and condition rating that allow for a physical condition "score" for the infrastructure to be developed. This is the most accurate means to determine the condition of the assets and assess their performance. Condition assessments are carried out on a component basis and rolled up to the asset level using the weight average replacement value.

For infrastructure without a standardized approach to condition assessment such as buildings etc., information such as visual inspections, condition audits, failure records and demands for routine maintenance are used in establishing the condition of the asset components. These are being aggregated to a condition rating for the asset as a whole on a weighted average basis. Again using the rubric from Table 5 it is possible to determine the ability of the asset to provide an acceptable service to the users. Table 11 reflects the condition assessments for the Township's portfolio of assets

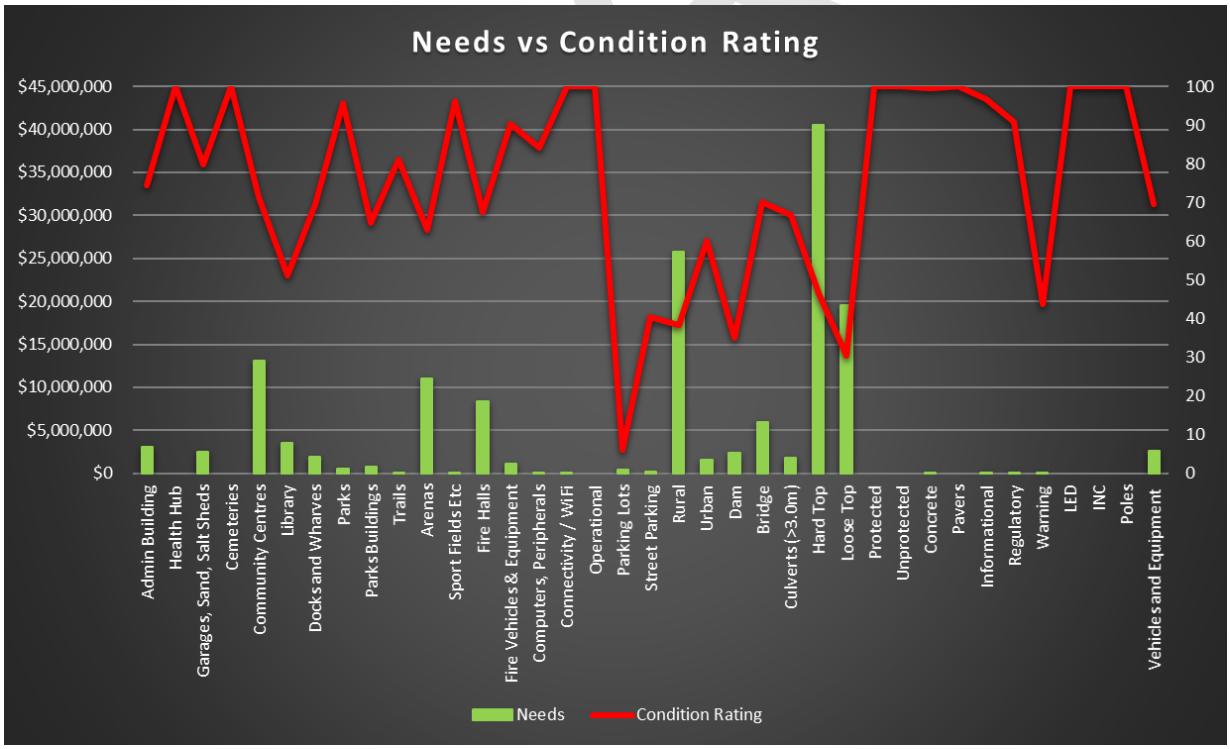
Table 11: Asset Condition Ratings Based on Needs

Asset System	Asset Category	Asset	Replacement Cost	Needs	Condition Rating	Condition State
Administrative Facilities	Civic	Admin Building	$12,229,000	$3,118,500	74.5	Good
	Medical	Health Hub	$2,232,600	-	100.0	V Good
	Works Yards	Garages, Sand, Salt Sheds	$12,438,900	$2,503,000	79.9	Good
Culture, Sports, and Recreation	Cultural Facilities	Cemeteries	$88,300	-	100.0	V Good
		Community Centres	$45,859,000	$13,139,800	71.3	Good
		Library	$6,240,000	$3,519,000	51.2	Fair
		Docks and Wharves	$7,215,500	$1,905,000	69.5	Good
	Recreation	Parks	$11,767,000	$514,700	95.6	V Good
		Parks Buildings	$2,933,500	$726,200	64.6	Fair
		Trails	$728,000	$137,000	81.2	V Good
	Sports	Arenas	$29,464,800	$10,975,200	62.8	Fair
		Sport Fields Etc	$1,545,500	$57,800	96.3	V Good
Emergency Services	Fire	Fire Halls	$25,758,800	$8,359,700	67.5	Good
		Fire Vehicles & Equipment	$10,969,000	$1,104,000	90.4	V Good
Information Technology	Hardware	Computers, Peripherals	$773,400	$122,500	84.2	V Good
	Network	Connectivity / WiFi	$85,700	$80,700	100.0	V Good
	Records	Digital	TBD			
	Software	Operational	$445,500	-	100.0	V Good
Parking	Surface Parking	Parking Lots	$407,100	$381,900	6.2	V Poor
		Street Parking	$430,900	$256,900	40.4	Poor
Storm Water Management	Drainage Systems	Rural	$41,703,000	$25,728,000	38.3	Poor
		Urban	$4,058,500	$1,623,400	60.0	Fair
		Dam	$7,325,000	$2,368,800	34.9	Poor
Transportation	Bridges and Culverts	Bridge	$19,775,000	$5,937,500	70.0	Good
		Culverts (>3.0m)	$5,567,500	$1,847,500	66.8	Good

	Roads	Hard Top	$236,612,000	$40,541,200	46.5	Fair
		Loose Top	$119,900,700	$19,559,600	30.5	Poor
	Railway Crossings	Protected	$600,000	-	100.0	V Good
		Unprotected	$100,000	-	100.0	V Good
	Sidewalks	Concrete	$400,400	$2,400	99.4	V Good
		Pavers	$48,300	-	100.0	V Good
	Signs	Informational	$124,800	$1,200	96.8	V Good
		Regulatory	$255,000	$23,700	90.7	V Good
		Warning	$156,600	$88,200	43.7	Poor
	Streetlighting	LED	$548,300	-	100.0	V Good
		INC	$8,000	-	100.0	V Good
		Poles	$1,425,000	-	100.0	V Good
Vehicles	Public Works Fleet	Vehicles and Equipment	$9,990 500	$2,626,500	69.5	Good
		Total	$620 211 100	$149,381,900	59.1	Fair

Table 10 indicates that overall the assets have a condition rating of 59.1. This would suggest that portfolio is generally performing reasonably well, at or above the fair condition state which is general accepted as the trigger point for major rehabilitation or replacement of the asset. Because the ratings are based on an assessment of each individual asset, the analysis is considered more rigorous than the remaining service life analysis. The value of the outstanding needs are considered a more accurate reflection of the existing backlog of deferred maintenance and repairs.

Figure 8. Needs vs Condition Rating



From the above data, a condition vs performance report card was prepared for the asset portfolio and is provided in **Table 12** below.

Table 12: Condition vs Performance Report Card

Asset System	Asset Category	Replacement Value	Score	Grade
Administrative Facilities	Civic	$26,900,500	4	B-
	Medical		5	
	Works Yards		3	
Culture, Sports, and Recreation	Cultural Facilities	$105,841,600	4	B-
	Recreation Facilities		4	
	Sports Facilities		3	
Emergency	Fire Buildings	$36,727,800	3	B-
	Vehicles and Equipment		4	
Information Technology	Hardware	$1,304,600	4	B
	Network		4	
	Software		3	
Parking	On Street Parking	$838,000	1	F
	Parking Lots		1	
Storm Water	Drainage Systems	$53,086,500	2	D-
Transportation	Bridges and Culverts	$25,342,500	3	D+
	Roads	$356,512,700	2	
	Railway Crossings	$700,000	5	
	Sidewalks	$448,700	5	
	Signs	$536,400	4	
	Streetlighting	$1,981,300	4	
Vehicles	Vehicles and Equipment	$9,990,500	3	C
	Totals	**$620,211,100**	**2.5**	**D+**

The Township receives a passing grade in terms of the overall performance of the infrastructure portfolio relative to its condition.

It is insightful to understand how the Township compares to other municipalities. **Table 13** provides a comparison between the Muskoka Lakes asset report card and the Canadian Infrastructure Report Card[3]. Generally speaking, the condition Muskoka Lakes has a comparable percentage of assets in the poor and very poor rating categories compared to the national average.

Table 13. 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
Buildings	8.9	17.8	8.6	22.7
Culture Recreation and Sport	6.2	23.3	12.7	19.8
Storm Water	15.5	37.4	11.3	19.0
Bridges	15.5	31.8	12.4	26.3
Roads	12.76	29.1	16.4	22.6

Source: CIRC (2019), Figure 5.

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

In aggregate Table 12 would suggest that the Township's experience is not dissimilar to that of the municipalities that participated in the survey and in some asset classes may well be performing better than average. It should be noted that a higher than average portion of the Township's assets are in the fair category and many just barely make it into the range of good condition. This would suggest that there is an accumulation of assets in the lower condition states and implies significant needs could be on the horizon. There is a glut of assets which will pass into the fair or worse condition state in the next few years without intervention.

2.7 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.

It is recommended that the Township adopt an Enterprise Risk Management Framework. The framework should be 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 14** illustrates a the risk management framework used for the current assessment.

Table 14: Recommended Risk Management Framework for Asset Management Decision Making

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

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. For buildings and facilities, consequences were based on the importance of the asset or facility to the community or business unit continuity under post disaster conditions. 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 the risk to vehicles or the 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 15 gives an assessment of the risk across each asset class in the Township's asset portfolio.

Table 15: Risk Assessments

Asset System	Asset	Probability of Failure	Consequence of Failure	Risk
Administrative Facilities	Admin Building	Unlikely	Major	Moderate
	Health Hub	Rare	Minor	Low
	Garages, Sand, Salt Sheds	Unlikely	Major	Moderate
Culture, Sports and Recreation Facilities	Cemeteries	Rare	Insignificant	Low
	Community Centres	Unlikely	Minor	Moderate
	Docks and Wharves	Possible	Minor	Moderate
	Library	Rare	Minor	Low
	Parks	Rare	Minor	Low
	Public Washrooms	Possible	Minor	Moderate
	Pavilions	Unlikely	Insignificant	Low
	Trails	Possible	Insignificant	Low
	Arenas	Possible	Significant	Extreme
	Golf Course	Rare	Insignificant	Low
	Sport Parks	Rare	Insignificant	Low
	Tennis Courts	Rare	Insignificant	Low
Emergency Services	Fire Halls	Unlikely	Significant	Extreme
	Equipment & Vehicles	Unlikely	Significant	Extreme
Information Technology	Computers, Peripherals	Possible	Major	High
	Connectivity / WiFi	Possible	Major	High
	Digital Records	Possible	Major	High
	Software	Possible	Major	High
Parking	Parking Lots	Unlikely	Minor	Moderate
	Street Parking	Unlikely	Minor	Moderate
Stormwater Management	Rural	Likely	Major	High
	Urban	Possible	Major	High
	Dam	Possible	Significant	Extreme
Transportation	Bridge	Unlikely	Major	Moderate
	Culverts (>3.0m)	Possible	Moderate	Moderate
	Hard Top	Possible	Major	High
	Loose Top	Possible	Major	High
	Protected RR Crossings	Unlikely	Moderate	Moderate
	Unprotected RR Crossings	Rare	Minor	Low
	Sidewalks Concrete	Unlikely	Minor	Moderate
	Sidewalks Pavers	Possible	Minor	Moderate
	Informational	Possible	Insignificant	Low
	Regulatory	Possible	Major	High
	Warning	Possible	Major	High
	Streetlight Luminaires	Almost Certain	Minor	High
	Poles	Rare	Minor	Low
Vehicles and Equipment	Vehicles	Almost Certain	Minor	Moderate
	Equipment	Almost Certain	Moderate	High

2.8 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 16** provides an overview of the inventory data confidence rating scales and descriptions.

Table 16. 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 17 provides the confidence ratings for each of the asset systems including comments summarizing the causes for the ratings.

Table 17. Inventory Data Confidence Rating for Asset Systems

Asset System	Average Data Confidence Percentage	Comments
Administrative Facilities	85%	Data is generally accurate. Some assumptions made with respect to replacement costs.
Culture, Sports, and Recreation	75%	Assessment based on current information and assumptions with respect to cost.
Emergency	90%	Age and condition well understood. Minor assumptions made on life cycle and costs.
Information Technology	85%	Age well understood. Condition ratings inferred from age.
Parking	60%	Urban areas well understood. Rural areas based on estimates of the quantities and condition only.
Storm Water	65%	Most location information is available. Some assumptions in terms of quantity and condition. Limited information relating to age and condition information is available.
Transportation	85%	Inventory information is based on data collected in the field and condition assessments completed in late 2021 and early 2022. The data is considered reliable.
Vehicles and Equipment	90%	Age and condition well understood.

The fire, fleet and transportation inventory information is considered the most accurate. Asset management principles have been practiced in these areas with greater rigor than has been the case in other areas of the Townships operations. Condition assessments are based on field data collected and are current with assessments completed in late 2021 and early 2022. They are considered highly accurate. By 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 85% to 90%.

By contrast the infrastructure data in the other areas of the Townships operations has not been a priority in past years and as a consequence the confidence in the information is lower. Considerable effort has been applied to gathering current and accurate data for the purposes of the development of the asset management plan based on a number of simplifying assumptions and data confidence is improving.

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.

2.9 Asset System Condition Summaries

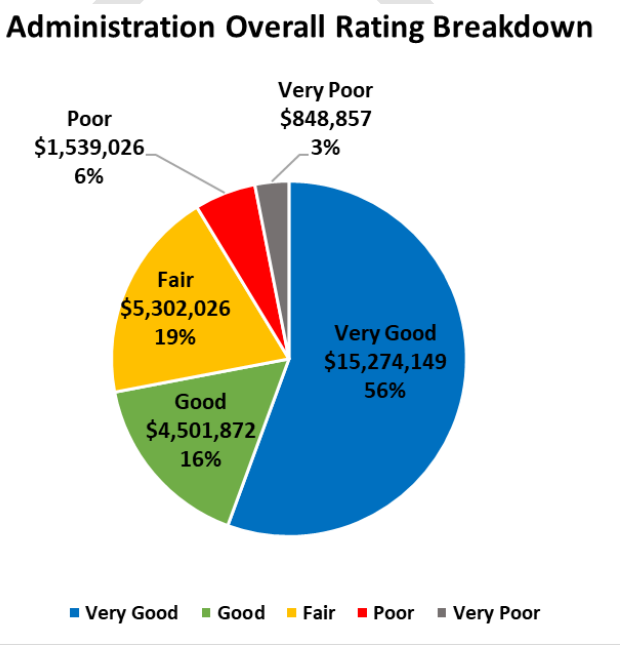
The following section summarizes the available replacement value and condition information specific to each asset system and their major asset types. At this time digital and non-digital assets have not been included, however are planned to be included in future iterations of the Asset Management Plan.

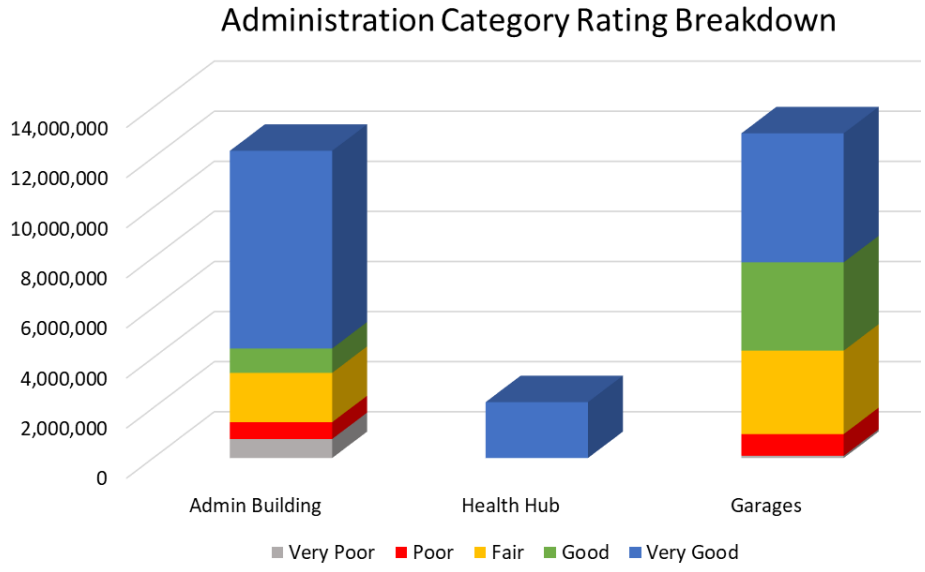
2.9.1 Administration Facilities

Replacement Value:	**$26,900,500**	**Data Confidence Grade:**	85%

Summary:

The asset category is made up the main Township office, the Health Hub and the three patrol facilities. The majority of facilities and their components are rated as being in good condition (CR= 79) While the assets are in good physical condition they are well advanced in the life cycle and in fact beyond the end of their useful lives. The assets require significant investments to remain serviceable. As noted in a recent study, the Township Office is functionally obsolete, not AODA compliant and requires upgrades to many of its systems. The Patterson Garage is beyond the end of its useful and requires replacement in the near term with approximately 29 percent of the facility rated as being in poor or worse condition.



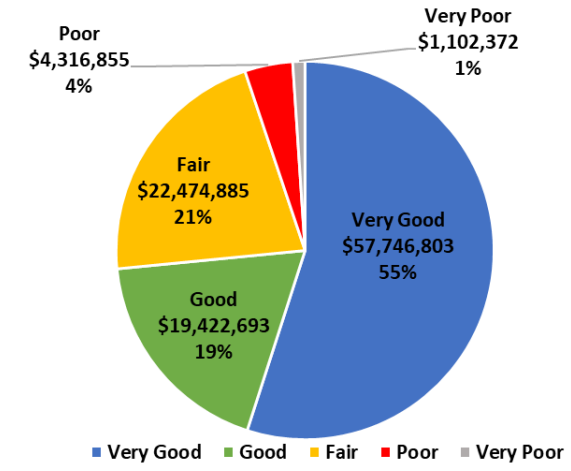


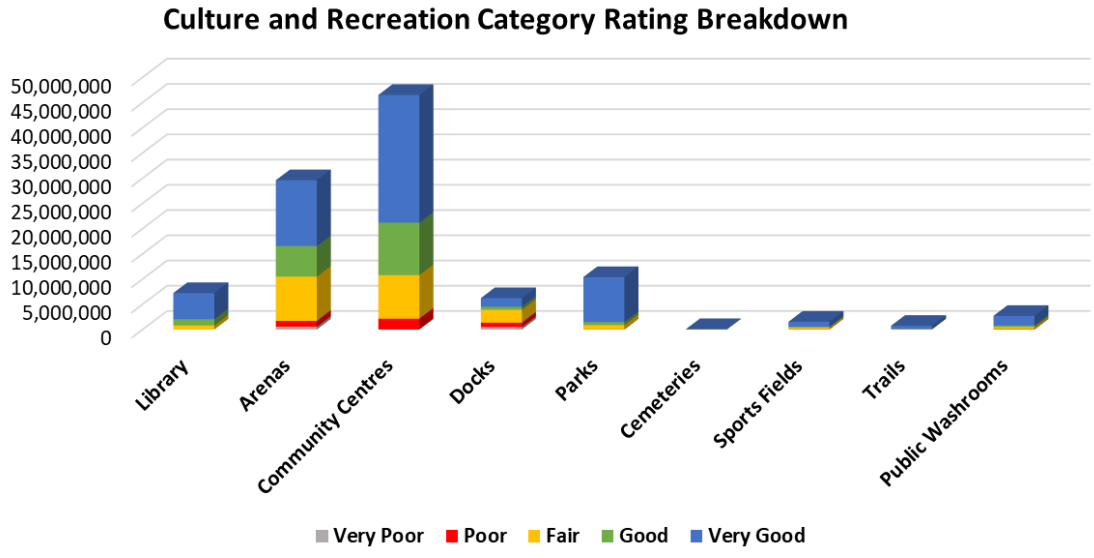
2.9.2 Culture Parks and Recreation

Replacement Value:	$105,841,600	Data Confidence Grade:	75%

Summary:

The Culture Parks and Recreation facilities are made up of the arenas, community centres, library and the parks and associated recreation infrastructure. Generally the infrastructure is in fair to good condition with an overall condition rating of 70.6 equating to a good condition state. As noted in several recent reports the arenas and several of the community centres are in fair to good physical condition but are beyond the end of their service lives and will require significant investments or replacement to remain in service. A number of the docks and wharves, particularly those inherited from the federal government in the mid 1990's will require significant rehabilitation or replacement within the next five to ten years. In the cemeteries, of the 8,814 plots, approximately 5,050 plots remain available. Based on current internment rates the supply should last for another 40+ years. Note that this does not account for geographic preferences. Parks infrastructure is generally in fair to good condition and should remain serviceable with normal maintenance. The Public Works Department recently completed a detailed Parks and Recreation Master Plan which addresses the need for infrastructure in depth.



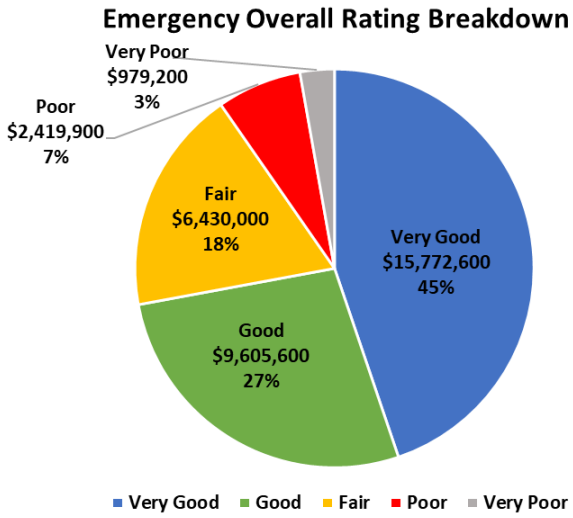


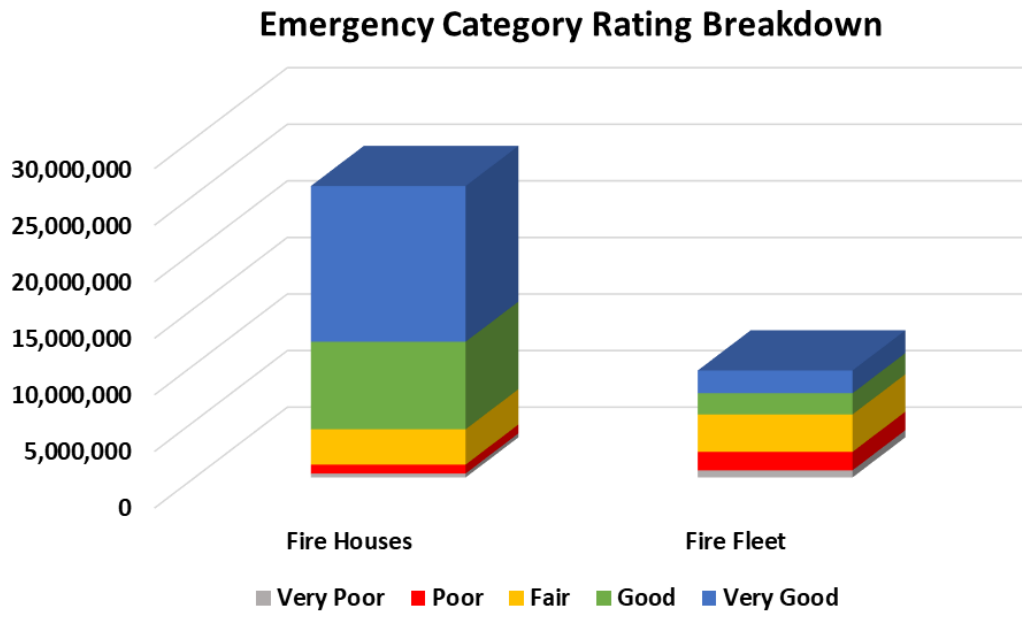
2.9.3 Emergency

Replacement Value:	$36,727,800	Data Confidence Grade:	90%

Summary:

The Emergency Services category is made up of all fire halls and outbuildings, and fire apparatus. The assets have a condition rating of 74.3 equivalent to being in good or better condition. The balance of the assets consist of those which are approaching the end of their useful lives as defined by NFPA guidelines or are functionally obsolete and require replacement. The Fire Department recently completed a detailed Fire Master Plan which will address the need for infrastructure in depth. One of the key recommendations is to undertake a detailed review of the condition of the halls including the degree to which they comply with NFPA standards and their location. Future replacement schedules should be dictated by the outcome of the location study.



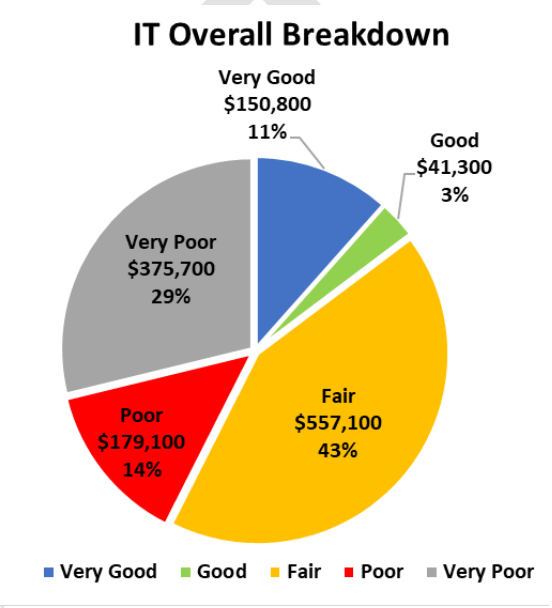


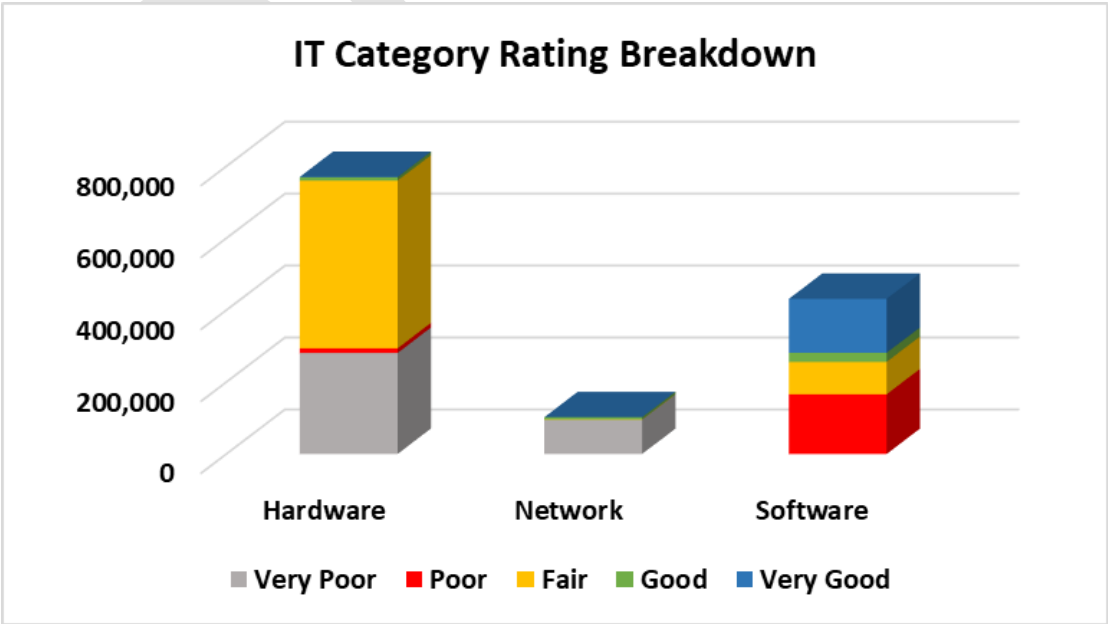
2.9.4 Information Technology

Replacement Value:	$1,304,650	Data Confidence Grade:	85%

Summary:

The department completed a master plan in 2022 which noted the need for significant updates to the Township's IT infrastructure. At that time 42.5 percent of the assets were rated as being in poor or worse condition. Substantial investments in 2023 and planned for 2024 and 2025 will significantly improve the current state particularly in terms of the hardware. It should be noted that the Township has several core software systems that are at or will reach the end of their lives within the next three to five years and will require replacement. Of particular importance in this regard is the financial system.



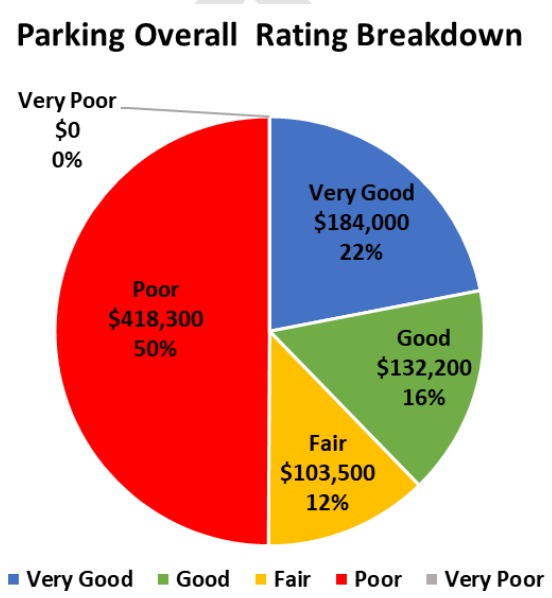


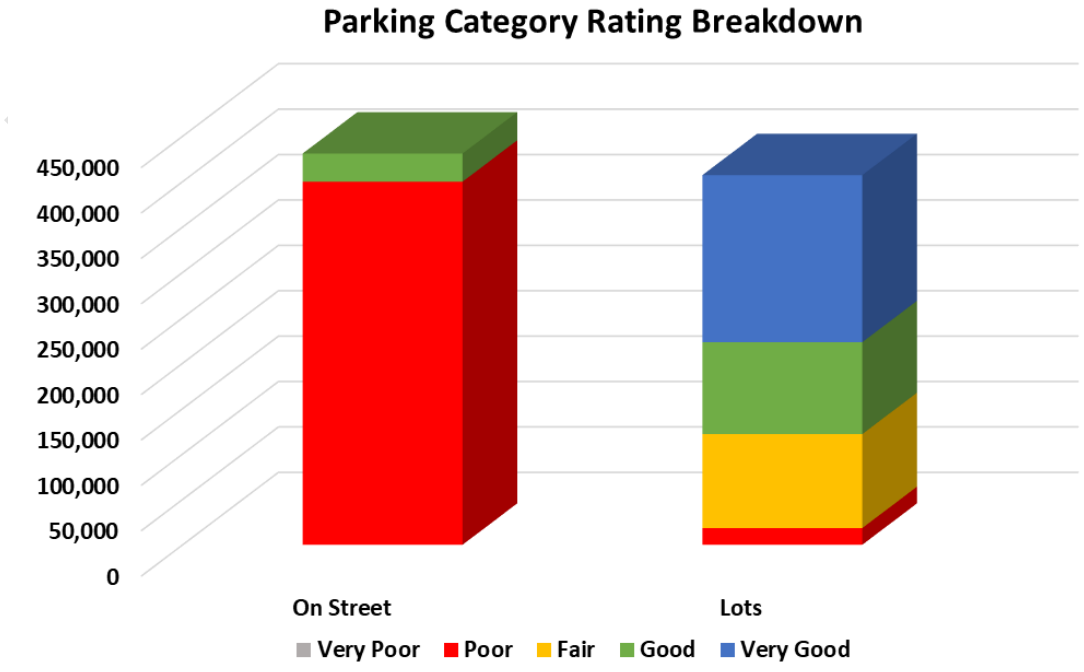
2.9.5 Parking

Replacement Value:	$838,000	Data Confidence Grade:	50%

Summary:

The parking category is made up of 139 on street stalls, predominantly located in Bala and Port Carling and an estimated 177 stalls located in designated parking areas mainly in Bala and Port Carling. Approximately half of the parking stalls (49.9% or $418,300) are rated as being in poor condition. The on street stalls are a function of the adjacent roadways and any capital improvements would be addressed at the time of the work on those roads which are predominantly under district jurisdiction.



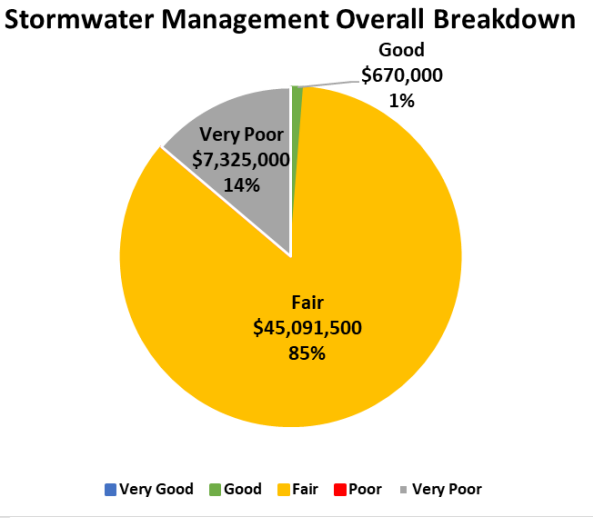


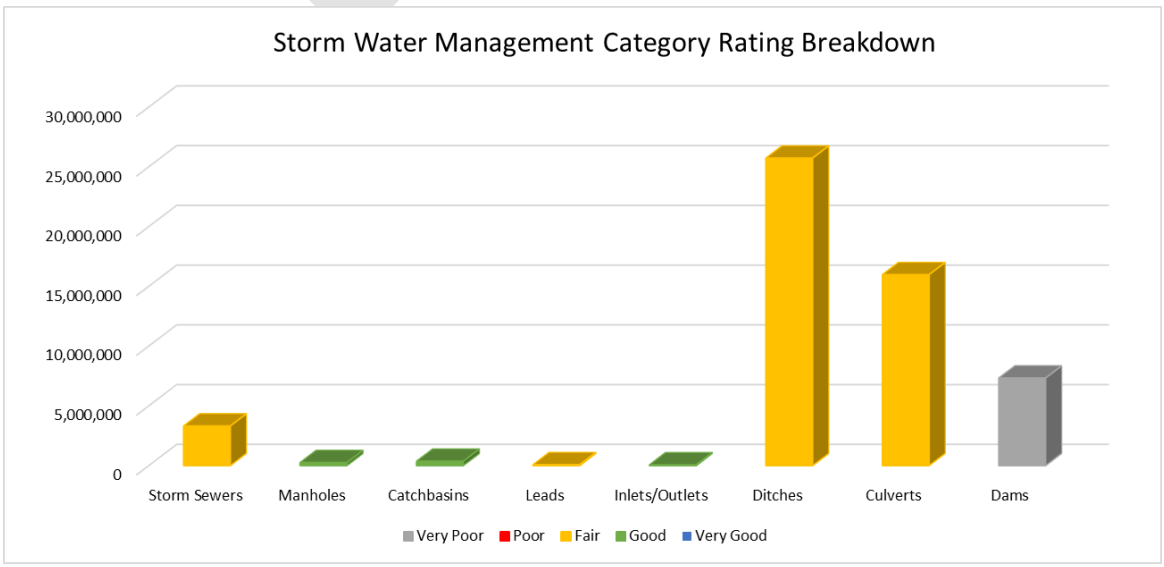
2.9.6 Storm Water Management

Replacement Value	$53,086,500	Data Confidence Grade:	65%

Summary:

This asset category is comprised of those drainage assets located in the Townships public rights of way and the Burgess Dam located in Bala. The majority of infrastructure (92% or $220,645,900) is rated as being in poor or worse condition. While remainder of (8 percent) of the inventory is rated as being in fair condition.



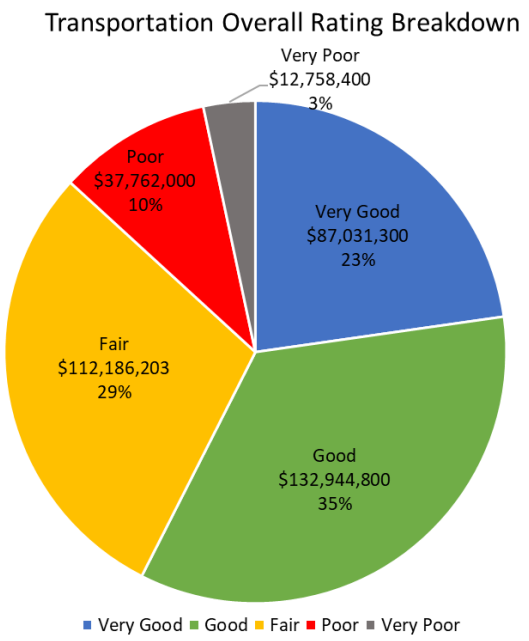


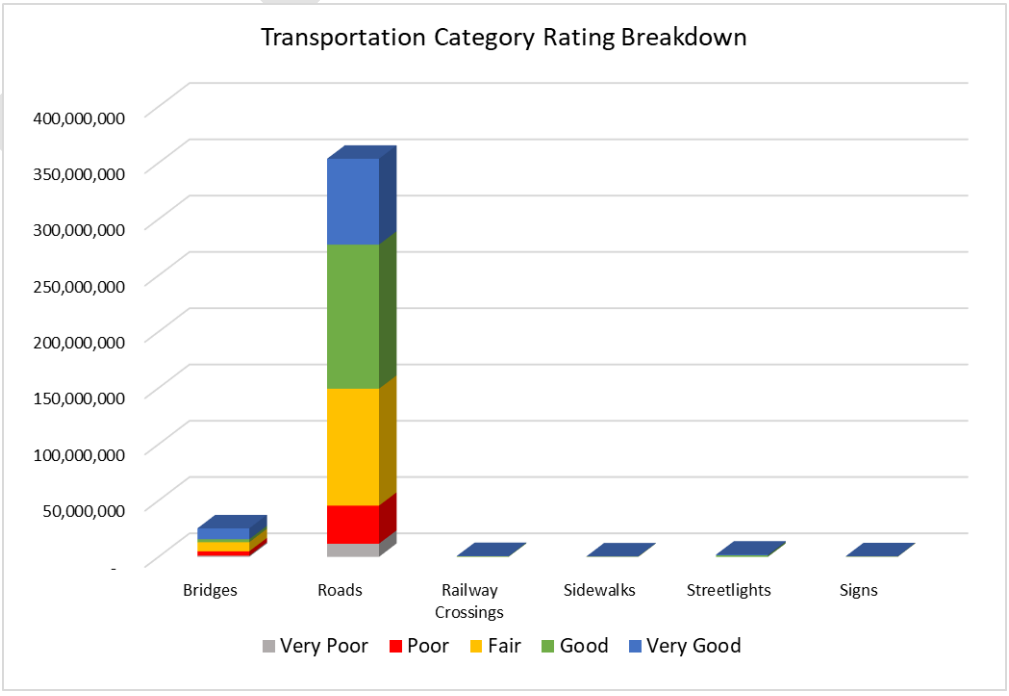
2.9.7 Transportation

Replacement Value	$385,521,600	Data Confidence Grade:	85%

Summary:

This asset category is comprised of those assets located in the Townships public rights of way and includes bridges and culverts, roads, sidewalks, signs and streetlights. This is the largest asset class by value of the assets under Township jurisdiction. The majority of infrastructure (92% or $356,512,700) is rated as being in poor or worse condition. The remainder of the assets in the category are rated as being in good or better condition. It is important to bear in mind that the transportation assets represent a significant value (385,521,600) in absolute terms and make up a large portion of the total replacement value for all assets (62 %) under Township jurisdiction.



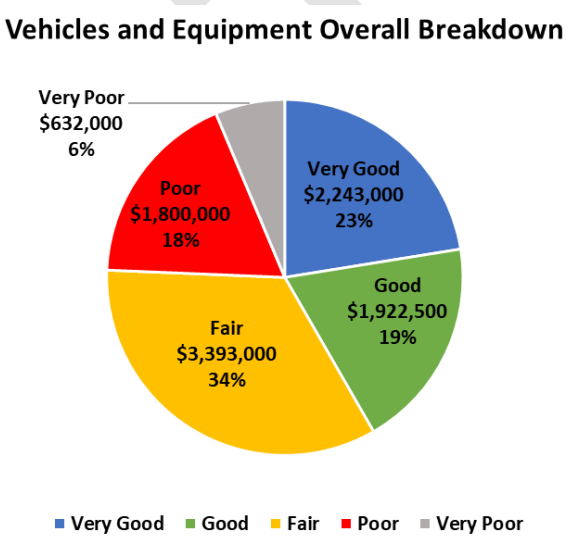


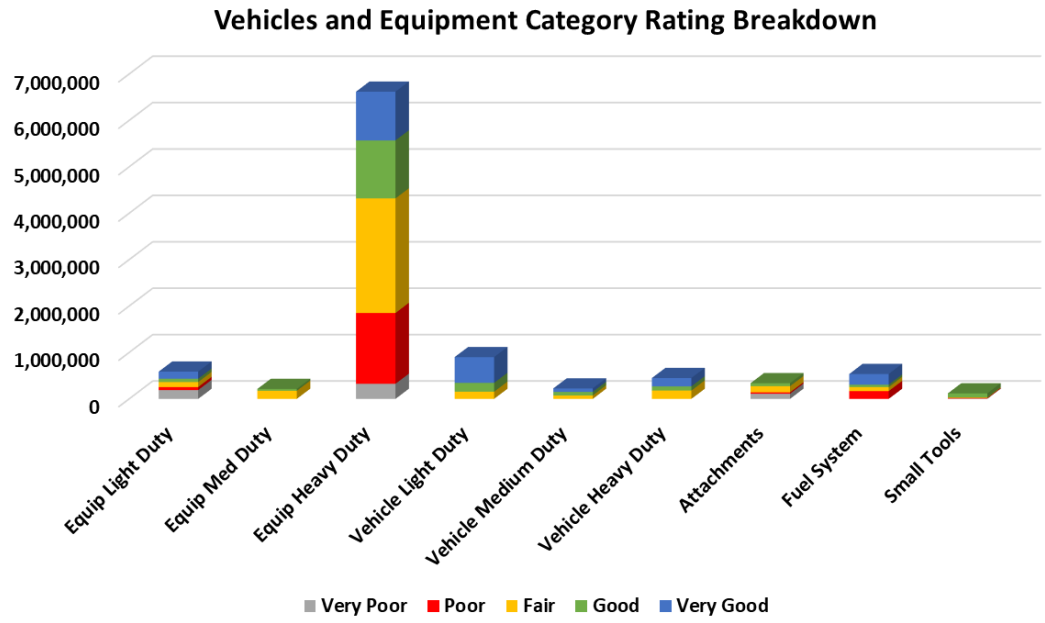
2.9.8 Vehicles and Equipment

Replacement Value:	$9,990,500	Data Confidence Grade:	90%

Summary:

This category includes all vehicles and equipment in the Development Services, Parks and Public Works Departments. Fire Equipment and Vehicles are reported in a separate category. As should expected the condition of the assets appear to be normally distributed. Over 42 percent or of the fleet ($4,165,500) is rated as being in good or better condition with 34 percent or $3,393,000 in fair condition and the balance in either poor or very poor condition. These latter to groups include vehicles that are at or beyond their useful lives and are scheduled for replacement in the near term.





2.10 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 key data sources was the MAM work management software system. This software system was obsolete and unstable was replaced in 2022 with the CityWorks Computerized Asset/Maintenance Management System. The new system is linked to the Esri GIS mapping system.

One of the initiatives started as part of the preparation of this report was the establishment of a Geographic Information System (GIS) database, in which to store the records associated with the asset portfolio. At this point approximately 75 percent of the base data has been transferred to the 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.

It is important to note that the development of the system was completed with a significant reliance on external resources. It is strongly recommended that an internal resource will be required to maintain the system into the future if the data is to remain relevant.

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 and condition 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 40 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:

- The correct quantity of assets to meet the Township's needs
- 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 demand for service and 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 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 3.3 to 3.9. While some asset classes like roads and bridges

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 corporate wide level of service study for the assets in 2024. 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 the 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;
- Service reviews; and
- Corporate wide 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 18**.

Table 18. Concepts of Levels of Service

Concept	Attributes	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 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 2024 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:

- Accessibility for Ontarians with Disabilities Act (AODA)
- Environmental Assessment Act, R.S.O. 1990, c. E.18
- Environmental Protection Act, R.S.O. 1990, c. E.19
- Highway Traffic Act, R.S.O. 1990, c. H.8
- MOECC Reg 347: General – Waste management (hazardous material transport)
- Municipal Act, 2001, S.O. 2001, c. 25
- National Fire Code
- Occupational Health & Safety Act
- Ontario Building Code
- Ontario Fire Code (Ontario Regulation 67/87)
- O. Reg 424/97: Commercial motor Vehicle Operators Information (Highway Traffic Act, R.S.O. 1990)
- O. Reg. 104/97: Standards For Bridges
- O. Reg 239/02 Minimum Maintenance Standards for Municipal Highways
- Ontario Water Resources Act, R.S.O. 1990, c. O.40National Building Code
- Public Transportation and Highway Improvement Act, R.S.O. 1990, c. P.50

3.3 Buildings

3.3.1 Target Condition and Function

Well-functioning buildings provide reliable, safe and predictable access and amenities for the purposes for which they were designed, such as administrative facilities, arenas, community centres, operational facilities etc. Architectural electrical and mechanical components perform in a way they do not detract from the experience or purpose of the building while minimizing energy and water usage.

3.3.2 Levels of Service

The levels of service for the Buildings asset class are largely focused on the condition of the buildings, measuring the extent and timeliness of maintenance and reinvestment (Table 19).

Table 19. Levels of Service

Asset	Performance Measure	Measure Type	Target	Results (2022)
Buildings	Energy Conservation	Regulatory	No target defined	Reportable on a case by case basis
	Facility Condition Index (FCI)	Condition	No target defined	Reportable on a case by case basis
	Repair Responsiveness: Urgent Repairs	Safety & Condition	No target defined	Reportable on a case by case basis
	Repair Responsiveness: Urgent Repairs	Community Survey	No target defined	No Report
	Recreation Facilities: % Satisfied or Very Satisfied	Community Survey	No target defined	2021 50% to 55% Depending on facility
	Manufacturer's recommended scheduled maintenance	Best Practice	No target defined	Reportable on a case by case basis

The primary level of service should be an overall target condition for the Township's buildings, using an industry standard such as a Facility Condition Index (FCI) measure. The Facility Condition Index is a measure of annual reinvestment needed to maintain the building at or above a specified condition. In Muskoka Lakes' case, the Council has not adopted a target for building condition. In most jurisdictions the generally accepted objective is to maintain buildings in an overall fair condition or better. Other levels of service include following the manufacturer's recommended preventative maintenance schedules, a target timeframe for routine and urgent repairs to be completed, patron satisfaction with the condition of the facilities and replacement of components at their end of life. Regulatory requirements for energy conservation and accessibility should be met through an annual capital reinvestment program.

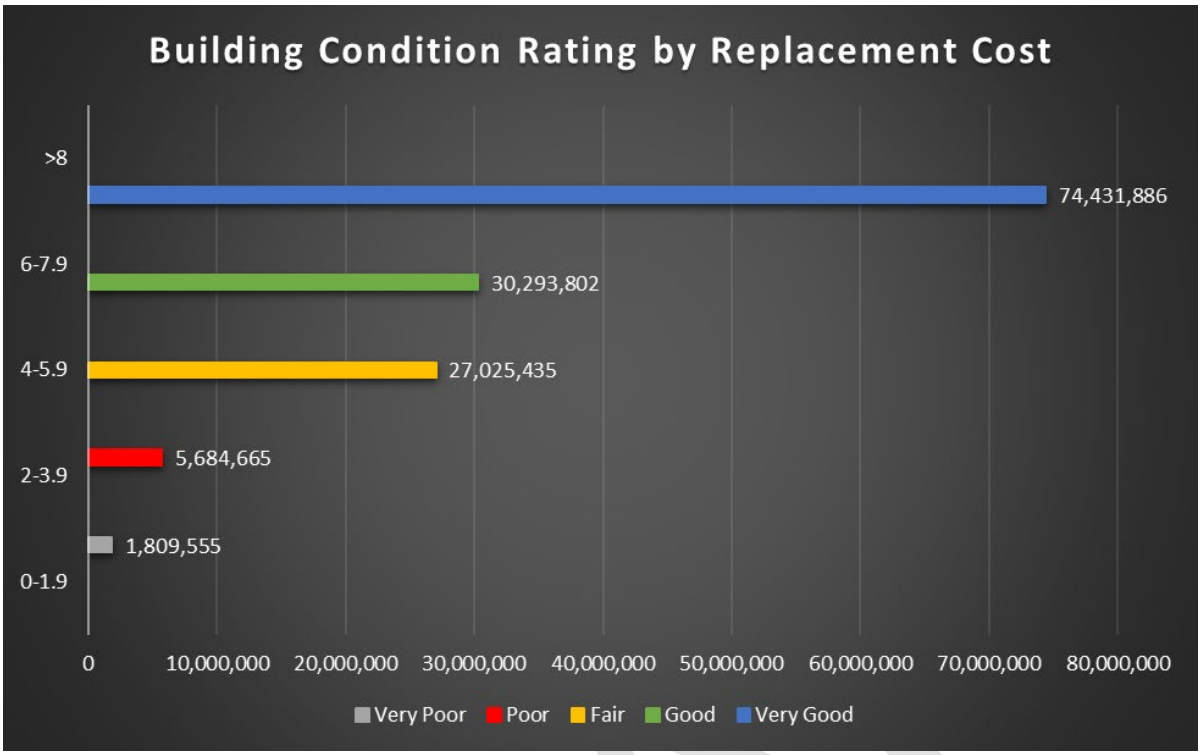
3.3.3 External Trends and Issues

The past practices in the management of the Township's buildings have not followed the principles of asset management. Past activity have been largely reactive and only when something is broken is it fixed and only when funds have been available to do so. Prioritization has largely been based on a worst first approach. Such an approach has been demonstrated to be the most expensive over the long term and produces the lowest levels of satisfaction. Many of the building systems are antiquated and do not comply with modern codes of practice or industry standards. Bringing the facilities into compliance will represent a major challenge and to do so in the context of modern requirements for energy conservation and emission controls will draw into question their sustainability. A longer term, more holistic approach must be considered balancing access to amenities with fiscal reality.

3.3.4 Key Findings

It is desirable that Council adopt a facility condition index target with the intention to keep the Township's buildings in "fair" or better condition over the long term. The Buildings levels of service include measures for condition, repairs and safety, resident satisfaction, preventative maintenance and capital reinvestment.. Similar to the Roadway System, there is an opportunity to set additional targets to measure performance and there is a data management opportunity to improve reporting on repair responsiveness and preventative maintenance to meet manufacturer's specifications. The system to track the work orders performed on the Township's buildings each year has recently been installed and new data management processes and tools will be developed achieve this objective.

Figure 9. Building Condition Rating by Replacement Value



3.4 Fire

3.4.1 Target Condition and Function

Well-functioning fire apparatus & equipment assets support the delivery of efficient and effective fire services and the management of those assets ensuring that they meet all regulated requirements and are safe and efficient to operate. Because of the nature of the functions they perform reliability is of paramount importance.

3.4.2 Levels of Service

Fire vehicles and equipment are a highly regulated asset class . As a result, the majority of levels of service involve meeting the regulations for certification as fire vehicles as well as commercial vehicles (Table 20). Other levels of service include following the manufacturer's recommended preventative maintenance schedules and guidelines for retirement of the assets at end of life according to NFPA standards. The department has completed a fire master plan. One of the chief recommendations is an examination of the deployments of the fire stations through the community. This review is currently under way. The outcome of this plan could have significant implications in terms of both quantity and quality of the vehicles and equipment in the inventory.

Table 20. Fire Levels of Service

Asset	Performance Measure	Measure Type	Target	Results (2022)
Fire Vehicles and Equipment	Regulatory Compliance MTO, NFPA	Regulatory*	Meet or exceed Ministry of Transportation requirements for each vehicle	Reportable on a case by case basis
	Manufacturer's recommended scheduled maintenance	Best Practice	No target defined	Reportable on a case by case basis
	Fleet Disposal Guideline NFPA Guidelines	Condition	No target defined	Reportable on a case by case basis
	Energy Efficiency	Best Practice	No target defined	Reportable on a case by case basis

3.4.3 External Trends and Issues

As shorter-lived assets, there are few risks that can affect the asset management of existing vehicles, but substantial changes to the fire vehicle fleet composition may be required in the coming years. These changes may include emissions reduction requirements, increased expectations for use of electric vehicles and charging stations, autonomous (self-driving) vehicles and use of alternative fuels.

3.4.4 Key Findings

The current focus of the apparatus and equipment asset levels of service is on:

- complying with the extensive regulatory requirements that govern fire, commercial and off road vehicles in Ontario,
- adherence to NFPA guidelines
- following manufacturers recommended maintenance schedules, and
- identifying vehicles for end of life replacement.

As shorter- lived assets that are easily seen and managed, the Township has developed good practices for maintenance, repair and replacement. Though the Township is meeting the regulatory requirements and is following best practice, there is a data management opportunity to improve reporting. There is also an opportunity as part of the Fire Master Plan to establish guidelines for right sizing the fleet and better aligning
individual vehicles with their intended uses.

3.5 Information Technology

3.5.1 Target Condition and Function

Well-functioning Information Technology assets support the delivery of municipal services and the management of assets. They provide a reliable, efficient and secure environment for the storage and use of information.

3.5.2 Levels of Service

Levels of service for the Information Technology asset class are predominantly driven by best practice, including replacing computers, peripherals, network components and software based on functionality rather than avoiding failures, and offering technical service through the Help Desk. There are no formal levels of service related to the condition of hardware assets, telecommunications assets or software assets.

Table 21. IT Levels of Service

Asset	Performance Measure	Measure Type	Target	Results (2022)
Information Technology	Help Desk Responsiveness	Best Practice	No target defined	Reportable on a case by case basis
	Data Integrity	Best Practice	No target defined	Daily, weekly, monthly and yearly data backups
	Security Monitoring	Best Practice	No target defined	Reportable on a case by case basis
	Hardware Replacements	Best Practice	Replace every four years	Reportable on a case by case basis
	Administrative Services: %Satisfied or Very Satisfied	Organization Survey	No target defined	Reportable on a case by case basis

3.5.3 External Trends and Issues

Muskoka Lakes has several risks and asset management challenges that are associated with the rapidly changing Information Technology sector. These were identified in considerable detail in the IT Strategic plan completed in 2022. These risks include the need to update foundational Information Technology systems to support newer application technologies, software upgrade delays where the rollouts are complicated by bypassing some versions to the most recent version, and maintenance of proprietary applications that are no longer supported. These risks emphasize the need for strong asset management of IT assets. Under-investment in Information Technology greatly limits asset management strategies for all other asset classes.

3.5.4 Key Findings

While there is an extensive number of operating and maintenance activities carried out to ensure that Information Technology Systems perform efficiently and reliably and are secure, levels of service for the overall Information Technology system are poorly defined. This is especially pronounced in the underlying foundational hardware systems which have aged, and in the approach to proprietary software and software upgrades. An Information Strategic Plan was recently completed and a number of applications are either being replaced or are proposed to be replaced. This presents an opportunity to establish performance measures and targets to incorporate into future asset management plans.

3.6 Parks and Recreation

3.6.1 Target Condition and Function

Well-functioning Parks & Outdoor Recreation assets provide reliable, safe and predictable outdoor access and amenities for residents to be active and involved as well as contributing to environmental protection.

3.6.2 Levels of Service

There are few levels of service for the Parks & Outdoor Recreation asset class (Table 22). Most of the focus for this asset class is on operations and maintenance to facilitate the large number of people that use these facilities on a daily basis, without target conditions being set for the assets themselves. One

area where there is a clear level of service requirement is for playgrounds which are assessed against the standard CSA Z614 “Children’s Play Spaces and Equipment”.

Table 22. Parks & Recreation Levels of Service

Asset	Performance Measure	Measure Type	Target	Results (2022)
Playgrounds	Canadian Standards Association (CSA Z614) requirements	Regulatory	Meet or exceed Canadian Standards Association (CSA) requirements for each facility	Reportable on a case by case basis
Parks & Outdoor Recreation	Parks Redevelopment Prioritization Rating System	Asset Condition	No target defined	Priority projects incorporated into ten year capital forecast
	Parks, Open Space and Pathways: % Satisfied or Very Satisfied	Community Survey	No target defined	2021 37%
	Canadian Standards Association (CSA Z614) requirements	Regulatory	Meet or exceed Canadian Standards Association (CSA) requirements for each facility	Reportable on a case by case basis

Additional levels of service arise from community survey which was completed as part of the Parks and Recreation Master Plan in the summer/fall of 2021. There are also capital replacement needs that are based upon lifecycle condition of parks assets, but the absence of performance measures or targets makes this program difficult to link to a level of service.

Further development of levels of service for Parks & Outdoor Recreation assets is underway is recommended as part of the Parks and Recreation Master Plan. When implemented they will expand condition based levels of service to a wider range of parks assets, including establishing target conditions and performance measures for the assets.

3.6.3 External Trends and Issues

The key factor affecting the delivery of service levels in parks and outdoor recreation is the ability to acquire sufficient parkland in areas of the Township. Over-use of assets in certain areas may also make it difficult to keep pace with service level expectations from the community. Additional analysis into this asset class will require the establishment of more comprehensive service levels for asset condition. The proposed level of service study slated for 2024 in combination with the setting of parks standards will assist in advancing the understanding of this area of the asset portfolio

3.6.4 Key Findings

While there is an extensive number of operating and maintenance activities carried out to ensure that parks assets are being kept in a safe, enjoyable condition, levels of service for the condition of Parks & Outdoor Recreation assets are currently poorly defined. A Parks Operations Levels of Service Study is recommended as part of the PRMP to provide performance measures and targets to incorporate into future asset management plans.

3.7 Parking Lots

3.7.1 Target Condition and Function

Well-functioning Parking Lots have driving surfaces and sidewalks that are smooth, clean, safe, durable, well lit, and that drain well, with signs and markings that provide clear direction to motorists and pedestrians. They support the economic vitality of our communities.

3.7.2 Levels of Service

Levels of service for parking lots assets are under consideration and are expected to mirror roads & traffic operations service levels. The levels of service are anticipated to closely follow the Ontario Minimum Maintenance Standards for Roadways, interpreting them for their applicability in parking lots. Currently asset management decisions for Township parking lots rely on the judgment of Township staff or are complaint driven.

3.7.3 External Trends and Issues

The influx of seasonal residents and visitors to the Township places considerable pressure on the demand for short term parking spaces, particularly in Port Carling where there is a lack of available land for this purpose. Pressures can be expected to increase for the foreseeable future.

3.7.4 Key Findings

A condition assessment of all parking lots was completed in 2021. Service levels were defined in terms of condition. An orderly program should be developed to monitor, maintain and replace parking lots, moving forward.

3.8 Roads

3.8.1 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 and pavement marking should be in place to provide consistent control of intersections, clear direction to motorists and pedestrians and adequate warning to motorists of non-standard conditions.

3.8.2 Levels of Service

Levels of service for Muskoka Lakes' roadway system (Table 23) 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 a result of the Transportation Master Plan and the operational levels of service assessment which will be required for the 2025 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 23 Roadway System Levels of Service and Community Satisfaction Measures

Asset	Performance Measure	Measure Type	Target	Results (2022)
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. Generally exceed MMS
	Pavement Condition Index (PCI)	Condition	No target defined	PCI = 6.5 (Fair)
	Road Condition: % in Good or Very Good Condition	Condition	No target defined	% Gd & V Gd = 57.8 %
	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	Meet or exceed minimum standards
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
Streetlights	Ontario Minimum Maintenance Standards (MMS) for Luminaires	Regulatory	Meet or exceed Minimum Maintenance Standards (MMS)	Achieve MMS Reqmts
	Streetlighting: % Satisfied or Very Satisfied	Community Survey	No target defined	No Report

3.8.3 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 roadbed resulting in poor performance of the road and damage to 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 roadbed.

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 contain district infrastructure or is impacted by a District

Road.

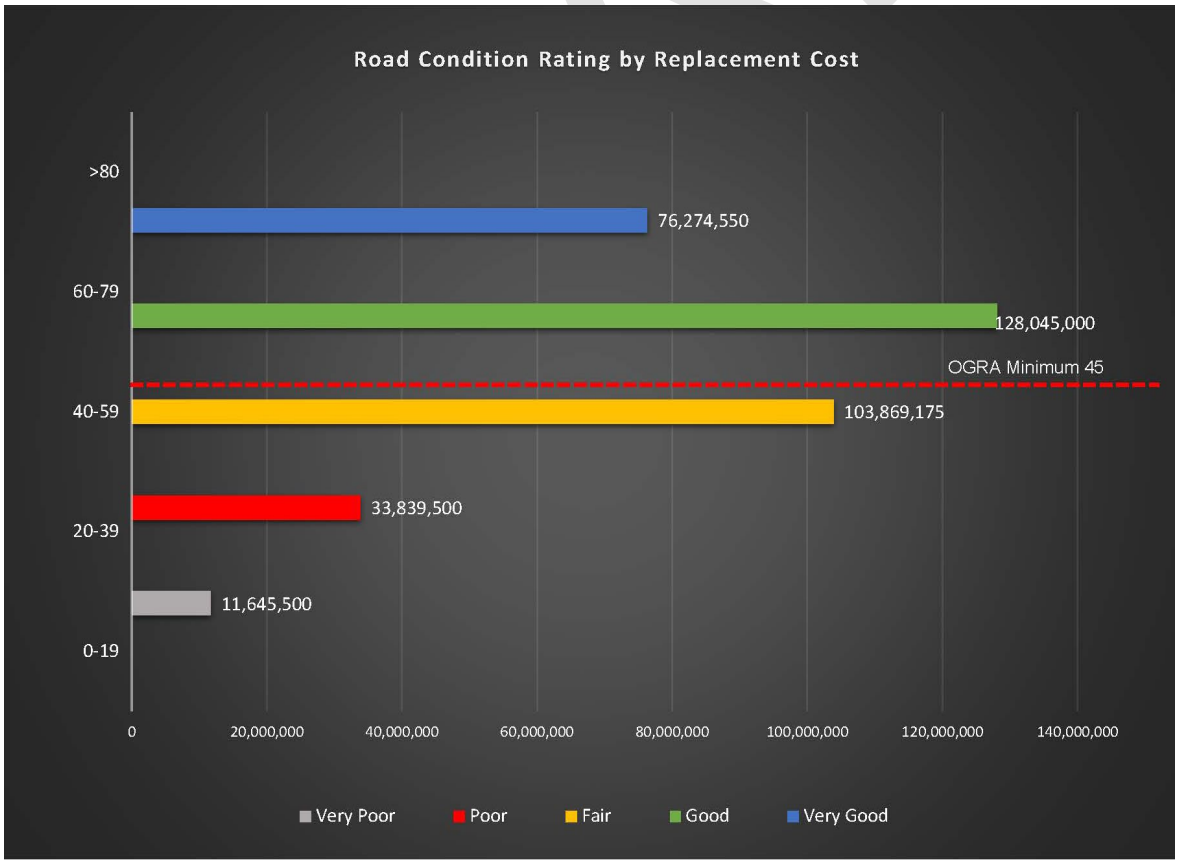
Climate change is increasingly having an influence on the design and construction of the road system. With the increased intensity and frequency of the significant weather events, the risk of flooding and blockage of the roadway due to deadfalls etc. is increasing. Consideration will have to be given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

3.8.4 Key Findings

A condition assessment of the road network was completed in 2022, 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.

Figure 10 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 dotted 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 stemming from the Transportation Master Plan.

Figure 10. 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 bridges and culverts. The traditional approach of managing strictly based on condition and adopting a worst first approach to reconstruction 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:

- Establishing targets will provide a clearer measure of whether roadway assets are performing adequately.
- Improved reporting through the CityWorks Works and Asset Management System will address this issue.

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.

3.9 Storm Water Management

3.9.1 Target Condition and Function

Well-functioning Storm Water Management assets provide unobstructed flow of water from rainfall and runoff events into the storm sewer piping/ditch systems and storm water management facilities (including dams and control structures) 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.

3.9.2 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 24). 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 24 Stormwater Management Levels of Service and Community Satisfaction Measures

Asset	Performance Measure	Measure Type	Target	Results (2022)
Stormwater Network	System Condition Rating	Asset Condition	No target defined	% Gd and V Gd = 1.3%
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

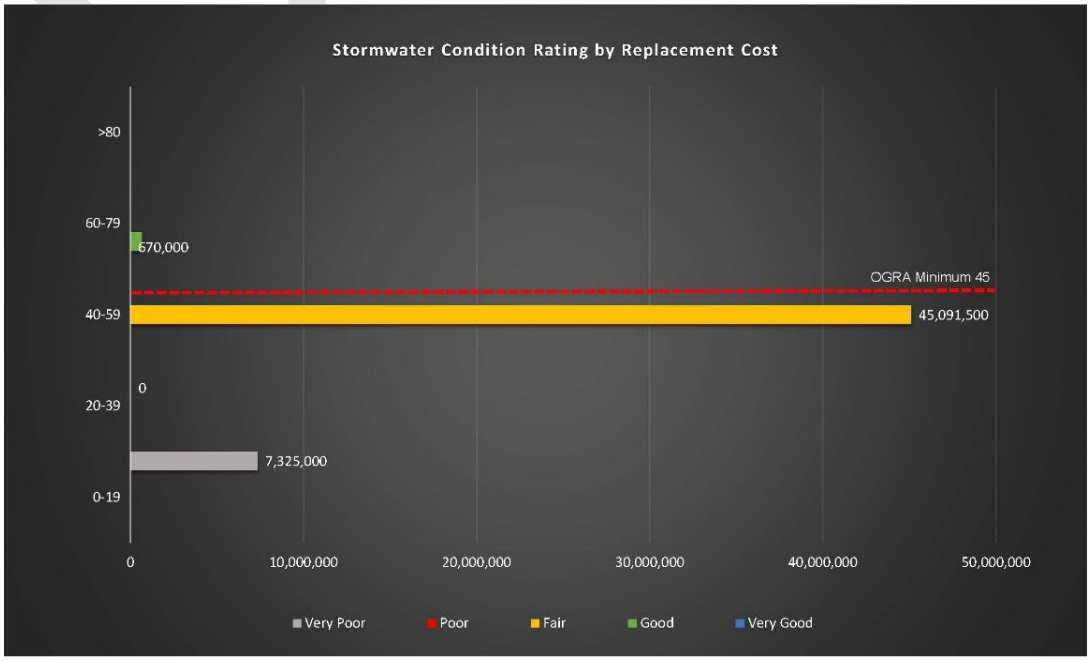
3.9.3 External Trends and Issues

There is strong coordination and integration between the storm water asset management strategies and the management of the roadway system assets as much of the storm water 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 storm water assets is the changing weather conditions associated with climate change. These changing conditions have the potential to render storm water assets ineffective to handle storms long before these assets reach their end of life. Storm water management continues to evolve rapidly and levels of service need to take into consideration new storm water treatment technologies as well as source and conveyance controls.

3.9.4 Key Findings

Of the core infrastructure levels of service for the storm water 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 11 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 11 Storm Water Condition Rating by Replacement Value



The current focus of the levels of service for Storm Water 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 storm water 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 storm water management to plan for mitigation and adaptation strategies.

3.10 Structures (Bridges and Culverts)

3.10.1. 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.

3.10.2. 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 25 Roadway System Levels of Service and Community Satisfaction Measures

Asset	Performance Measure	Measure Type	Target	Results (2022)
Bridge System	Overall System Condition: % in Good or Very Good Condition	Condition	70%	% Gd & V Gd = 59.4%
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	71
	Resident Satisfaction; % Satisfied or Very Satisfied	Community Survey	No target defined	No Report

3.10.3. 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.

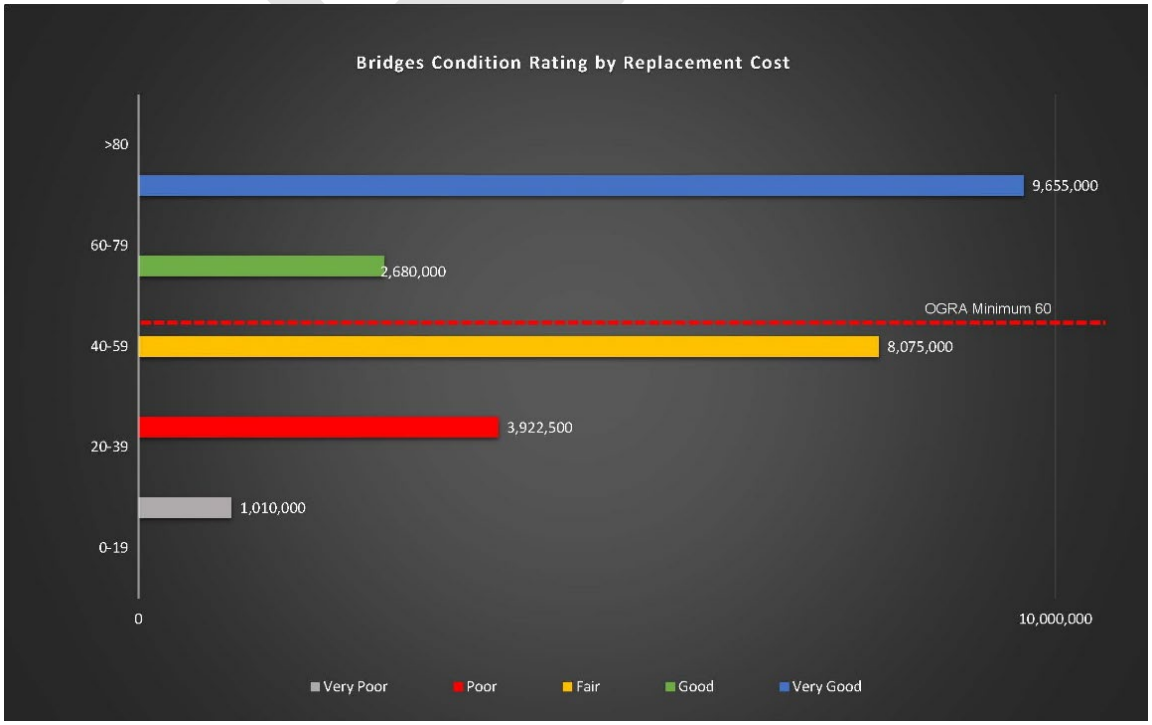
There are other external influences on the bridge system that need to be considered when planning for levels of service. One is the relationship between the Township of Muskoka Lakes and District of Muskoka. The District owns and operates the arterial roads, the water and wastewater systems and the public 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.

3.10.4. Key Findings

Figure 12 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 12: 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.

3.11 Vehicles and Equipment

3.11.1. Target Condition and Function

Well-functioning Vehicles & Equipment assets support the delivery of municipal services and the management of assets; they meet all regulated requirements, and are safe and efficient to operate.

3.11.2. Levels of Service

Heavy vehicles and equipment are a highly regulated asset class. As a result, the majority of levels of service involve meeting the regulations for commercial and off road vehicles (Table 26). Other levels of service include following the manufacturer's recommended preventative maintenance schedules and guidelines for disposal of the assets at end of life. Additionally a fleet utilization policy to right size the fleet and better align individual fleet vehicles for the uses intended, including the provision of energy efficient vehicles, should be developed.

Table 26 Levels of Service Vehicles and Equipment

Asset	Performance Measure	Measure Type	Target	Results (2022)
Vehicles and Equipment	Regulatory Compliance MTO, Highway Traffic Act	Regulatory	Meet or exceed Ministry of Transportation requirements for each vehicle	Reportable on a case by case basis
	Manufacturer's recommended scheduled maintenance	Best Practice	No target defined	Reportable on a case by case basis
	Fleet Disposal Guideline	Condition	No target defined	Reportable on a case by case basis
	Energy Efficiency	Best Practice	No target defined	Reportable on a case by case basis

3.11.3. External Trends and Issues

As shorter-lived assets, there are few risks that can affect the asset management of existing vehicles, but substantial changes to the vehicle fleet composition may be required in the coming years. These changes may include emissions reduction requirements, increased expectations for use of electric vehicles and charging stations, autonomous (self-driving) vehicles and use of alternative fuels.

3.11.4. Key Findings

The current focus of the Vehicles & Equipment asset levels of service is on: complying with the extensive regulatory requirements that govern commercial and off road vehicles in Ontario, following manufacturers recommended maintenance schedules, and identifying vehicles for end of life replacement. As shorter- lived assets that are easily seen and managed, Muskoka Lakes has developed good practices for maintenance, repair and replacement.

Though Muskoka Lakes is meeting the regulatory requirements and is following best practice, there is a data management opportunity to improve reporting. There is also an opportunity as part of a Fleet Utilization Review to establish guidelines for right sizing the fleet and better aligning individual vehicles with their intended uses.

3.12 Other Considerations

The asset management plan is intended to address the needs of the existing infrastructure and provide a plan for addressing those needs over the term of the plan. This will not however address the anticipated future needs and therefore will not provide Council with a complete picture of the total needs facing the community.

Since the release of the Core Asset Management Plan, the Township has completed three master planning exercises including:

- Parks and Recreation Master Plan
- Fire Master Plan
- Transportation Master Plan

In addition two follow up studies; the Arena Feasibility Study and the Fire Station Location Study have been initiated to examine high priority level of service questions stemming from the respective master plans. Each master plan has highlighted the need for improved and expanded levels of service to meet unfulfilled needs in the current programs and/or additional expectations from the community. These include:

Parks and Recreation Master Plan:

The P&RMP identified 111 recommendations in three broad service directions;

- Enhance Program Offerings and Partnerships
- Rethinking Facilities
- Creating an Effective Recreation Organization

The recommendations promote a future vision for the Township and the direction will of necessity have an impact on current assets. It is therefore relevant to the asset management issue.

Of the recommended improvements approximately half would involve staff time for implementation of the initiative. The remaining recommendations represent a potential commitment of $51,835,000 over the next 25 years and may involve the creation of new assets including a new field complex, new arena(s) and new indoor recreations space(s). This amount equates to an average annual expenditure of $2,073,400 per year. If the recommendations are implemented Council will have to consider a potential consolidation of several facilities into a smaller number of more centralized and efficient assets with greater number of amenities and an expanded offering of more outdoor focused recreation opportunities. The net affect will be right sizing of assets with a short term reduction in operating expense and the potential for the proceeds from possible sales of existing assets devoted to new assets better suited to the needs of the community.

Given that new facilities are being created there may be an opportunity to fund these projects using a combination of grants and debt financing. The cost of these projects can't be determined at this time. Council will have to identify the priority and timing of these projects and adjust financial projections accordingly

Fire Master Plan:

The Fire Master Plan and Community Risk Assessment identified 58 recommendations involving

improvements in three categories;

- People (Firefighter recruitment and retention, & training) 5 recommendations
- Processes (By-law, policies, agreements & procedures) 46 recommendations
- Product (Capital assets, software investments) 7 recommendations

The cost of these recommendations should be considered as part of the overall asset management plan in order that proper financial planning can take place over the next 25 years. The bulk of the recommendations are operational and will be considered as part of future operating budget discussions. The 'product' recommendations represent a potential commitment of $2,300,000 over the next 25 years with potential of $11,400,000 in fire station investments. This amount equates to an average annual expenditure of $548,000 per year."

Transportation Master Plan:

The TMP identified 82 recommendations involving improvements in five broad categories;

- local road and bridge,
- public transit,
- active transportation,
- parking and
- lake access

The cost of these recommendations should be considered as part of the overall asset management plan in order that proper financial planning can take place over the next 25 years. Of the recommended improvements approximately half (38) would fall under the authority of either the District or MTO who would bear the bulk of the responsibility for implementation of the initiative. The remaining 44 recommendations represent a potential commitment of $12,742,900 over the next 25 years. This amount equates to an average annual expenditure of $510,000 per year.

On the basis of the foregoing, Council consider an average annual allocation of approximately $1.5 M to address growth and related needs with sporadic larger investments to fund larger individual projects at least for the term of the plan. The allocation should be revised with the update of each of the master plans so that adequate allowances can be made in the Township's financial plan.

3.13 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 2025.

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 province to provide perspective on LOS approaches that have already been established and ensure that the Township of Muskoka Lakes' LOS Frameworks will align with experience and best practices from elsewhere.

3. Development of Public Engagement Strategy: A public engagement strategy 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 to 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 to include key service attributes, which are phrases that describe the service that will be provided.

6. Level of Service Statements: The LOS frameworks to 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: Develop targets for each of the service areas for identified metrics from the Levels of Service Frameworks. This will be achieved by engaging both internal and external stakeholders in a dialogue centred on around the desired level of service, considering both the cost of the level of service and the desired output. Customer and technical performance measures should be SMART (specific, measurable, achievable, relevant, and time-bound).

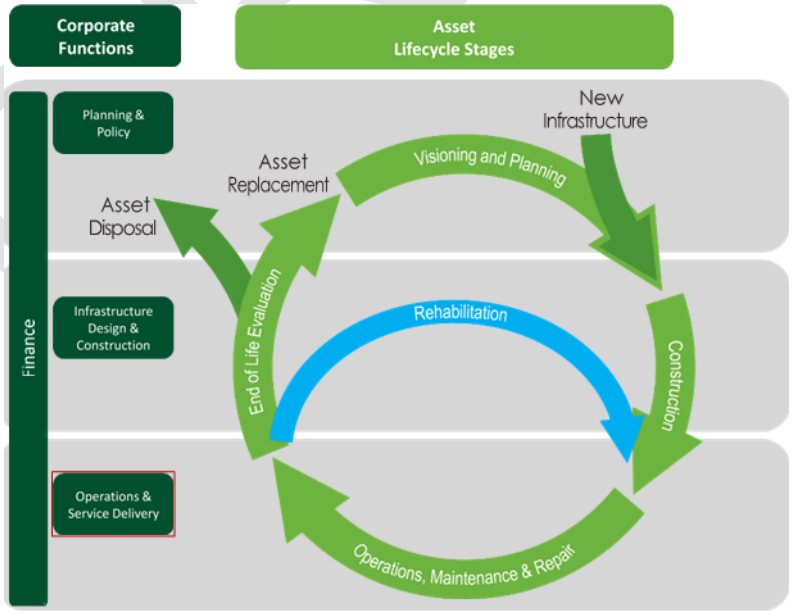
8. Risk Assessment: Risk assessments for all services identified in the service inventory review.

9. A 10-year implementation plan with recommendations on how to update and improve existing levels of service information.

4 Asset Management Strategies

Asset management strategies are a series of planned actions that Township will use to manage its infrastructure in order to meet defined levels of service. The life cycle of an asset typically starts with the identification of a need. Once the need has been defined, the asset is acquired or constructed. The asset is then operated and maintained on an ongoing basis until a more invasive treatment or renewal is required. As the asset nears the end of its life, a plan is established to replace the asset in like kind, upgrade the asset to meet the future needs or decommissioned and disposed of the asset if no longer required. These activities collectively represent the asset's lifecycle as illustrated in Figure 13 below.

Figure 13: Asset Management Life Cycle



4.1. Asset Management Strategies

In asset management, the focus should be on using a full lifecycle approach when considering the acquisition of an asset. The planned actions throughout the asset's full lifecycle will enable the assets to provide desired levels of service in a sustainable way, while managing risk, at the lowest lifecycle cost. It is important to note that an 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. As an 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.

As specified in the Building Together Guide, lifecycle management strategies can be broadly grouped into the following key categories:

- 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. For example, the sealing of a roadway to defer the need for replacement.
- 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 previously un-serviced areas – or to expand services to meet growth demands.

These actions help to maintain our assets 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.

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 the formation of the Township of Muskoka Lakes. 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 criterion 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 reached when it 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 risk assessments associated with decommissioning and disposal of assets. With the recent completion of the asbestos surveys of all Township building, the Township is much better informed as to the extent of this long term liability. Asbestos was found in 10 out of the 44 buildings surveyed. Of the ten buildings, three of the locations are friable and require immediate attention. These situations will be addressed in 2024. The remaining seven sites are considered stable and of no immediate concern. These will require remediation at the time of the next rehabilitation of the facility or upon disposal of the asset. The estimated cost of the remediation is $210,000.

4.3. Options Analysis

In order to achieve the lowest for the assets it is important to consider the options available at each stage of the lifecycle 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 the goal of minimizing the total lifecycle cost 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 recently embarked on comprehensive process to plan for the future growth of the Township through the development of a series of master plans. In particular the he Township is guided by a number of planning documents including the Strategic Plan (2020), Official Plan (2023), Parks and Recreation Master Plan (2022), Fire Master Plan (2022) and a Transportation Master Plan (2023). Each of these documents has been 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 should coordinated through the 10 year capital forecast, balancing funding allocations amongst the growth needs of the master plans, 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 and maintenance activities should be considered every budget cycle and should be the focus of internal reviews, such as a core services review. There are opportunities to develop more options analysis at the operations, maintenance and repairs stages of the lifecycle resulting in lower costs. Options analysis during the operations phase of asset lifecycles should be a future focus in the ongoing development of the CityWorks work and asset management program as more data becomes available.

4.3.3. Rehabilitation

Infrastructure assets which are candidates for rehabilitation should be a more detailed options analysis supported by detailed condition assessment reports. There are several 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. Similar indices exist for facilities. Incorporated into the option analysis should be a 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 results 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 storm water assets, to avoid impacts and unnecessary costs.

4.3.5. Asset Replacement Priority Rating Systems

For each asset class, different considerations are weighted 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 option analysis that assesses the risks and advantages of the proposed project implementation options. Each option analysis 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 4.4 to 4.12.

4.4. Buildings

4.4.1. Asset Management Strategies

Although Muskoka Lakes has a range of buildings that accommodate different uses, the strategies to maintain the buildings at their target condition are similar. There is only one set of asset management strategies for Muskoka Lakes's buildings instead of strategies for each type of building, which is an industry-wide approach. For example, maintenance of heating, ventilation and air conditioning are similar, regardless of the type of building, as are the maintenance strategies for the electrical systems, foundation and interior walls. One drawback to this approach relates to Heritage Buildings. While most components of Heritage Buildings can be managed like a conventional building, others, like the designated heritage features, need specific attention.

Traditionally asset management of buildings in Muskoka Lakes consisted of regular cleaning and fixing what was broken when it happened. Staff moved continuously from one crisis to the next. There was not any proactive asset management strategies in place for each stage of a building's lifecycle. In the last five years the Township has adopted a more proactive approach to the management of its building assets. Table 30 identifies as recommended approach which is robust and will serve the Township well into the future. As a first step the monitoring, operation, maintenance and repair stages of the lifecycle have been strengthened. It is recommended that these measures should be formalized through the adoption of a level of service guideline. The guideline should outline responsibilities for daily weekly, monthly, quarterly and annual inspection, operating and maintenance requirements and service level standards for repairs. Within the buildings asset management strategies a strong emphasis should be placed on preventative maintenance and following the manufacturers recommended maintenance programs.

Major component replacements, such as the replacement of lighting and heating systems, follow well established processes, as do the rehabilitation of facilities. Several of Muskoka Lake's buildings such as the Raymond and Ullswater Community Centres as well as the Township Offices have undergone major renovations to keep these facilities within their target condition, to meet accessibility and energy conservation requirements, and to adapt to the changing needs of the community. Only rarely is it necessary to decide that a building is at its end of life, and then decommission the building and possibly build a new one. Finally, energy audits and energy conservation goals may result in early replacement of building components where the savings justify the costs.

Table 27. Buildings Life Cycle Actions

Buildings Life Cycle Actions	
Life Cycle Stage	Actions
Monitoring	Building automation system monitoring Daily, weekly, monthly, quarterly annual inspections as per the Service Level Agreement
Condition Assessment	Asset condition surveys every 5 years
Operations & Maintenance	Daily, weekly, monthly, quarterly, annual operations as per the level of service guidelines Preventative maintenance work orders
Repairs	Demand maintenance work orders
Rehabilitation	Building rehabilitation/renovation subject to capital option analysis
End of Life	Building replacement/disposal subject to option analysis

4.4.2. Options Analysis and Project Prioritization

There are asset management strategies for major building components at each stage of a building's lifecycle. The majority follow manufacturers recommended maintenance schedules, which is a strong approach. Decisions to apply asset management strategies to operate, maintain and repair buildings should be established through a level of service guideline and tracked through the CityWorks Work and Asset Management System. Rehabilitation, including the replacement of building system components or major renovations to facilities should be guided by a lifecycle planning tool and option analysis which should include the evaluation of alternatives.

4.4.3. Key Findings

There is an opportunity to establish specific asset management strategies for the Township's buildings, to look at a process to identify components that are not near their end of life but are requiring frequent repairs and to look at standards for the initial construction of a building in the context of minimizing overall lifecycle costs.

4.5. Fire

4.5.1. Asset Management Strategies

Asset management strategies for Muskoka Lakes's fire vehicles & equipment are largely driven by Ontario regulations, National Fire Prevention Association guidelines and following manufacturers recommended maintenance schedules (Table 28). The majority of these strategies are in the monitoring and preventative maintenance stages of the lifecycle to try to minimize unplanned service interruptions and costs. At the End of Life, vehicles are replaced taking into consideration changes in technology, fuel efficiency and intended use. Once the replacement vehicle is in place it is placed in reserve and the displaced vehicle is sent to auction to recoup residual value.

Table 28 Fire Vehicle Life Cycle Strategies

Vehicles and Equipment Life Cycle Actions	
Life Cycle Stage	Actions
Monitoring	Daily Circle Checks Annual Inspection and certification Annual Safety Validation Emissions testing
Condition Assessment	Annually at time of certification
Operations & Maintenance	Annual service Seasonal service Manufacturer recommended scheduled maintenance Retorque wheels
Repairs	Demand Work Orders
Rehabilitation	Capital option analysis
End of Life	Disposal of Vehicles & Equipment (Auction)

4.5.2. Options Analysis and Project Prioritization

End of life decisions are dictated by NFPA guidelines which recommend that fire apparatus be replaced every 15 years. When vehicles near their End of Life the condition and annual operating cost for the vehicle are evaluated to determine whether vehicles can be kept in service. NFPA guidelines allow for extension of the life for up to an additional five years subject to annual certification. In this way capital costs are kept to a minimum. Additionally, a Station Location Optimization Study has recently been initiated. Depending on the outcome of the study there may be an opportunity to right-size the fleet. The recently deployed CityWorks fleet management module will significantly improve staff's ability to track the monitoring, operations & maintenance and repair actions in the future.

4.5.3. Key Findings

Asset management strategies for Muskoka Lake's fleet of fire vehicles & equipment assets follow regulated requirements and the manufacturers recommended preventative maintenance schedules. Options analysis is focused around the timing of the end of life disposal of a vehicle and around purchase of new vehicles. A station location optimization study is underway which will establish options for right-sizing both the stations and the fleet.

4.6. Information Technology

4.6.1. Asset Management Strategies

Asset Management Strategies for the Information Technology assets focus on monitoring and preventative maintenance such as keeping hardware and software secure and virus free, providing software updates, backing up data and following manufacturers recommended maintenance schedules (Table 29). A Helpdesk is available to assist users with issues that are affecting their use of Information Technology assets.

End of life replacement of desktop hardware is on a four year cycle and the intention is to plan for network hardware replacement on a five year cycle. Replacement frequency of smartphones and cellphones is based on contract renewal dates of 3 to 4 years and replacement of other Information Technology assets is subject to an option evaluation.

Table 29 Information Technology Life Cycle Strategies

Information Technology Life Cycle Actions			
Life Cycle Stage	Hardware	Software	Telecom
Monitoring	Security & Virus Scans	Security & Virus Scans	
Operations & Maintenance	Data backups Manufacturers recommended maintenance Annual maintenance contracts	Software updates	
Repairs	Service requests through eService and Helpdesk	Service requests through eService and Helpdesk	Service requests through eService and Helpdesk
End of Life	Desktop computers replacement: 4 years Network components replacement: 5 years Capital option analysis	Capital option analysis	Capital option analysis

4.6.2. Options Analysis and Project Prioritization

Options analysis and project prioritization of Information Technology assets is currently undertaken on a project by project basis through the annual IT Capital Planning process. The Township should look to improve this approach to include more proactive asset management strategies. An Information Technology Strategy was completed in 2022 to update the asset management strategies and create a roadmap for keeping Muskoka Lake's information technology systems effective and current.

4.6.3. Key Findings

Asset management strategies for Information Technology assets and data focus on scheduled monitoring and preventative maintenance as well as service requests through the eService portal. The development of an Information Technology Strategy, the recent shift to a new service provider and an update to the eService portal are expected to improve options analysis and project prioritization from a project by project basis to a more planned and integrated approach.

4.7. Parking Lots

4.7.1. Asset Management Strategies

Asset management strategies are not in place for the Township-owned parking lots. Protocols should be put in place and should consist of strategies adapted from the roadway system for use in a parking lot context. A full range of asset management strategies are proposed for this highly visible asset class (Table 30) moving forward.

Table 30 Parking Lot Life Cycle Strategies

Parking Lot Life Cycle Actions	
Life Cycle Stage	Actions
Monitoring	Monthly inspection (Road Patrol)
Condition Assessment	PMS update every 3 years. PQI used to rate parking lot surface condition Annual Sidewalk Rating System
Operations & Maintenance	Sweeping Debris removal Crack sealing Asphalt cold patching Winter maintenance Line and marking repainting Light standards annual test Light standards annual maintenance
Repairs	Shouldering Curb repair Sign and post repair Graffiti removal Fence repair or replace Asphalt hot patching Asphalt cold patching Concrete grinding Mud jacking Interlocking base repair/reinstall Luminaire replacement Pole repair Pole replacement Electrical supply repair
Rehabilitation	Asphalt shave and pave Asphalt full overlay Asphalt infrared seal Asphalt micro-seal Sidewalk bay replacement
End of Life	Capital option analysis

4.7.2. Options Analysis and Project Prioritization

Currently, Muskoka Lake's parking lots have limited inspections and repairs are carried out on an as-needed basis. Moving forward there is an opportunity to adapt strategies similar to those for the roadway system to the parking lot context and to track monitoring, operations & maintenance and repair decisions through the CityWorks Work and Asset Management System. From an options analysis perspective, much of what is applied to the management of the roadway system is applicable to parking lot assets.

The need for rehabilitation is identified by condition assessment results and each project should be supported with an option analysis which should include an evaluation of alternatives. A condition assessment has been recently completed for several of the parking lots. The recommendations from the condition assessment will be incorporated into the Township's ten year capital forecast on an ongoing basis.

End of life replacement of parking lot assets may be included during the upgrade of the associated facilities, carried out as part of a major building renovation, or proceed separately subject to an approved option analysis.

4.7.3. Key Findings

Asset management strategies and options analysis for parking lots need to be defined. Previously, Muskoka Lake's parking lots were inspected irregularly and repairs were carried out on an as-needed basis. Many

of the strategies for monitoring, operations & maintenance, repairs and rehabilitation of the roadway system are suitable to be adapted to the parking lot context. A condition assessment of some assets has identified the need for repairs and rehabilitation which should be incorporated into the Township's ten year capital forecast.

4.8. Parks and Recreation

4.8.1. Asset Management Strategies

Muskoka Lakes has an substantial system of parks and outdoor recreation assets that are widely used by the community. Parks and outdoor recreation assets are highly visible to the community and currently much of the Township's management efforts go into maintaining the appearance and usability of these facilities through general operational activities like mowing grass and sanitation. While Muskoka Lakes meets the regulatory requirements for monthly inspection of playgrounds it needs to move towards a more preventative maintenance approach. The remainder of the strategies involve repairing assets on an as needed basis (Table 31). The need for better monitoring and preventative maintenance strategies has been identified and a study is proposed to proceed in 2024 to establish a range of strategies to better manage parks and outdoor recreation assets with an emphasis on monitoring and preventative maintenance.

Rehabilitation strategies usually involve replacing individual components of a park that can no longer be kept in target condition through repairs, such as a playground equipment replacement. Rehabilitation activities are typically initiated inspections. End of life replacement should be triggered through either an lifecycle analysis or a park redevelopment approach.

Table 31 Parks and Trails Life Cycle Strategies

Parks and Trails Items Life Cycle Actions				
Life Cycle Stage	Paths & Trails	Playgrounds	Servicing & Furnishings	Sports Facilities
Monitoring	Monthly Inspection	Weekly Inspection	Weekly Inspection	Monthly Inspection
Condition Assessment	Annual Condition Assessment	Annual Condition Assessment	Annual Condition Assessment	Annual Condition Assessment
Operations & Maintenance	Snow removal Mowing General Turf Maintenance Sanitation	General Surface /Turf Maintenance Sanitation	May be undertaken to support capital option analysis	Diamond Dragging Lining Fields Mowing Fertilization Aeration Top Dressing Overseeding
Repairs	Repairs Path/Walkway Repairs Bridges Repairs Parking Lots/ Roads	Repairs Play Equipment Repairs	Repairs Fences/Gates Repairs Parks Furniture/ Signs/ Shelters/Bleachers Repairs Utilities/ Servicing Repairs Irrigation Repairs Sports Field Lighting Repairs Pathway Lighting	Sports Facility Repair
Rehabilitation	Capital option analysis	Capital option analysis	Case option analysis	Capital option analysis
End of Life	Park Redevelopment Process or lifecycle analysis identifies priority projects to include in the Ten Year Capital Forecast	Park Redevelopment Process or lifecycle analysis identifies priority projects to include in the Ten Year Capital Forecast	Park Redevelopment Process or lifecycle analysis identifies priority projects to include in the Ten Year Capital Forecast	Park Redevelopment Process or lifecycle analysis identifies priority projects to include in the Ten Year Capital Forecast

4.8.2. Options Analysis and Project Prioritization

As the focus for the management of Muskoka Lake's parks and outdoor recreation assets for much of their lifecycle is on general operational activities and repairs when needed, there is little options analysis currently being undertaken until the assets near their end of life. One exception is for sports fields where there have been recent efforts to improve turf quality. A study is proposed for 2024 which will determine additional strategies to better manage parks assets focusing on monitoring and preventative maintenance.

Monitoring, operations and maintenance and repair actions are currently tracked through the CityWorks Work and Asset Management System, but with insufficient detail to evaluate the effectiveness of the different strategies.

The need for rehabilitation is identified on the basis of condition assessment results.

End of Life replacement for the parks & outdoor recreation assets are currently being completed on an adhoc basis. A more planned approach utilizing a lifecycle planning and prioritization tool is recommended. The lifecycle approach should track the condition of different assets in a park and when a number of assets are nearing end of life, an evaluation should be made to determine whether it would be advantageous to plan for the replacement of the entire park. Parks redevelopment plans should be prepared for the Township's community parks to determine whether there is an opportunity to redevelop parks to better meet the need of the changing community based on established criteria. These projects should then be recommended for inclusion in the Township's ten year capital forecast.

4.8.3. Key Findings

Asset management strategies for Muskoka Lake's Parks & Open Space System are currently focused on general operations and repairs. A study is proposed to expand the number of strategies and place more emphasis on better monitoring and preventative maintenance. This will facilitate a stronger approach to options evaluation during the monitoring, operations & maintenance and repair stage of the asset lifecycle. Rehabilitation activities should be undertaken following the preparation of an option analysis. There is a need for a stronger end of life process which covers the need to replace parks and outdoor assets either due to condition or changing needs in the community.

4.9. Roads and Ancillary Items

4.9.1. 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 32). These actions are largely driven by the Ontario Minimum Maintenance Standards. The Township has not traditionally followed these actions.

Table 32 Roads and Ancillary Items Life Cycle Strategies

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 option analysis	Shave and pave Full overlay Infrared seal Micro-seal	Sidewalk bay replacement Asphalt full overlay	Capital option analysis	
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 LED light conversion project completed in 2018.

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. Such project may require coordination with the District. 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.

4.9.2. 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 Township's 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 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 option analysis 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.

4.9.3. 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 option analysis 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
- Water and Sewer (in urban areas):
- Road Usage: Road Class, School/Community Centres/Parks, Sidewalks
- Recommended Sidewalk Priority Rating System
- Road Function
- Traffic Characteristics (25%)
- Importance to network

4.10. Stormwater (Rural and Urban

4.10.1. Asset Management Strategies

The Township's storm water management assets play an important but not commonly known function in protecting the environment and protecting our community. Storm water management assets are integrated into the other assets in the community and need to be coordinated with other asset classes. Storm water 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 storm water pipes are located within the road structure, and storm water outfalls and storm water management facilities may be in or adjacent to parks and open space.

The long expected life of storm water 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 storm water assets (Table 33) 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 storm water management facilities should be developed through condition assessments. Rehabilitation of components of the storm water network are infrequent and should be initiated by a capital option analysis 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 storm water network and the storm water management facilities should have established rating systems. The storm water network components should be considered as part of the road reconstruction priority rating system.

Table 33: 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 option analysis	Sediment removal Capital option analysis
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

4.10.2. Options Analysis and Project Prioritization

The bulk of the focus for the management of Township's storm water 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 option analysis 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 storm water 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 option analysis option analysis which includes the evaluation of alternatives. The need for rehabilitation of storm water 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 storm water network assets should be prioritized as part of the road reconstruction priority rating system. A second rating system for storm water management facilities, should focus on prioritizing upgrades to achieve storm water 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 Storm Water Management Prioritization

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

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 storm water flows through. This should be addressed as part of a consideration of environmental assets.

4.10.3. Key Findings

The Township's storm water assets are integrated with other asset classes. The focus for these 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 urban storm water 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.

4.11. Structures (Bridges and Culverts)

4.11.1. Asset Management Strategies

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 34). These actions are largely driven by the Ontario Minimum Maintenance Standards.

Table 34 Bridges and Culverts Life Cycle Actions

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 option analysis
End of Life	Capital option analysis

***OSIM – Ontario Structure Inspection Manual*

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 roughness and protect the underlying structure and road bed.

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 option analysis 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.

4.11.2. 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 option analysis 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.

4.11.3. Key Findings

There are 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 option analysis 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.

4.12. Vehicles and Equipment

4.12.1. Asset Management Strategies

Asset management strategies for Muskoka Lake's vehicles & equipment are largely driven by Ontario regulations for the safe operation of motor vehicles and following manufacturers recommended maintenance schedules (Table 35). The majority of these strategies are in the monitoring and preventative maintenance stages of the lifecycle to try to minimize unplanned service interruptions and costs. At the end of life, an option analysis is prepared for a replacement vehicle taking into consideration changes in technology, fuel efficiency and intended use. Replaced vehicles are sent to auction to recoup residual value.

Table 35 Vehicles and Equipment Life Cycle Strategies

Vehicles and Equipment Life Cycle Actions	
Life Cycle Stage	Actions
Monitoring	Daily Circle Checks Annual Inspection Annual Safety Validation Emissions testing
Condition Assessment	Annually at time of certification
Operations & Maintenance	Annual service Seasonal service Manufacturer recommended scheduled maintenance Retorque wheels
Repairs	Demand Work Orders
Rehabilitation	None
End of Life	Disposal of Vehicles & Equipment (Auction) Capital option analysis for replacement

4.12.2. Option Analysis and Project Prioritization

Options analysis for vehicles and equipment assets features most significantly as decisions are made to take the vehicle out of service at its end of life and when decisions are made to purchase a new vehicle. When vehicles near their end of life, the condition and annual operating cost for the vehicle are evaluated to determine whether vehicles can be kept in service for an additional season. This is helping to offset the need for seasonally leased vehicles. A fleet utilization study should be undertaken to establish fleet utilization standards for the cost-effective use of a vehicle over its lifecycle, identify under-utilized vehicles and make recommendations to right-size the fleet. Monitoring, operations and maintenance and repair actions are not currently actively tracked. The soon to be deployed CityWorks Fleet Management module will facilitate a more proactive approach to fleet management.

4.12.3. Key Findings

Asset management strategies for Muskoka Lake's vehicles & equipment assets follow regulated requirements and the manufacturers recommended preventative maintenance schedules. Options analysis is focused around the timing of the end of life disposal of a vehicle and around purchase of new vehicles. A fleet utilization study should be completed within five years to establish standards for the optimum usage of vehicles and right-sizing the fleet.

5 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 requires the current version of the plan to address the Township's infrastructure assets based on the delivery of the current level of service and the current level of annual investment. 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. The level of service analysis will occur in 2024 subject to Council's approval.

To ensure that Council has the complete picture respecting the Township's needs, the results from the various Master Plans (Fire, Recreation, Parks and Trails, and Transportation) will need to be to be layered in on top the next version of the plan. This will then give Council the appropriate level of information on which to examine alternatives and tradeoffs and arrive at the ultimate levels of service levels and the means to support them, which O. Reg. 588/17 requires to be in place by 2025.

The financial strategies revolve around the budget process. The budget is informed by the strategic plan and the adopted master planning documents. Through the budget process, revenue sources are confirmed and forecasting is undertaken including the management of reserves. The budgets ultimately authorize spending and identify the funding sources for projects and programs

5.1 Annual Budget Process

The Township's budget is made up of two components:

- The Operating Budget and
- The Capital Budget

The operating budget consists of expenses that cover day-to-day activities or operations, including items

such as utilities, rent, insurance, staff wages and benefits, program supplies, maintenance and repairs. In the context of the asset management plan, the operating budget allocates funds for the operation, maintenance and repair lifecycle stages of these assets.

The capital budget and 10 year capital forecast represent a comprehensive financial plan that addresses the financial requirements of the renewal and replacement of the existing infrastructure. In the context of asset management planning, the annual Capital Budget allocates funds each year for the rehabilitation and replacement lifecycle stages of existing infrastructure assets funded primarily from tax levy. The 10 Year Capital Forecast is a comprehensive plan identifying priority projects for growth, rehabilitation, and replacement over the next ten years. The preparation of the Township's budget is guided by the three primary objectives. These are:

- Maintain existing service levels;
- Minimize the tax rate impact;
- Remain true to our financial principles; which are:
    - Thorough short and long term planning;
    - Prudent consideration of reserves;
    - Leverage available funding sources.

The budget is informed by the strategic plan and the adopted master planning documents. Through the budget process, revenue sources are confirmed and forecasting is undertaken including the management of reserves. The budgets ultimately authorize spending and identify the funding sources for projects and programs.

5.2 Revenue Sources

The Township has several sources of revenue to support the ongoing management of its core infrastructure assets. These are identified in Table 36 below.

Table 36: Sources of Revenue

Revenue Source	Description
Property Tax	Residential and commercial property owners pay an annual tax to the Town, which pays for many of the services used by the residents and owners.
Sale of Assets	This includes but is not limited to the sale of surplus land, vehicles and equipment that have reached end of life.
Interest on Reserve Balances	The Town holds money in reserve funds for regulated and discretionary reasons. These funds earn interest that is a revenue stream.
Development Charges	Contributions from developers used to fund growth related infrastructure.
Local Improvement Charges	Fees charged to property owners for local upgrades, such as upgrading the road network from a rural to urban standards.
Federal Gas Tax Grants	A long term grant agreement with the Federal government that provides a portion of the Federal gas tax revenues to municipalities.
Grants	Grants are contributions from parties external to the organization. This typically comes from grants from senior levels of government.
Debt*	Normally used to purchase an asset outright. Must be offset with new future revenue or a reallocation of revenue.
Public Private Partnership (P3)	A financing and risk-sharing arrangement contracted with a private company for the design, build and financing of a government-owned asset. Must be offset with new future revenue or a reallocation of revenue. Not normally applicable to core infrastructure.

A number of these revenue sources are restricted to the acquisition of growth assets, which are usually acquired or funded through the development process. A few others may be beyond the scope of the

Township's operations. Consequently, the range of alternatives available to operate, maintain, repair, rehabilitate and replace existing infrastructure is restricted to property taxes, grants and debt for all practical purposes.

5.2.1 Historic Revenues

Asset management activities to operate and maintain existing infrastructure are funded through the Operating Budget. From 2018 to 2022 total revenues that support operations, including asset management strategies, has grown from just over $17.9 million to almost $21.6 million (Table 37). The majority of revenues are funded by property tax, which accounts for over 63% of total revenues. The remaining sources each contribute individually an average of 1 to 3% of the annual total operating revenue.

Table 37 Historical Revenue Sources

Source	2018	2019	2020	2021	2022
Property Tax Levy	$11,653,018	$12,323,847	$12,549,825	$12,971,679	$13,346,672
Fees and User Charges	3,188,191	3,429,053	2,952,077	3,041,497	3,756,313
Federal Grants	-	234,603	599,510	409,799	372,138
Ontario Grants	1,725,336	2,699,623	2,370,650	2,528,894	2,269,833
Interest Earned	749,642	426,295	233,705	112,288	483,345
Interest and Penalties on Tax Arrears	476,483	549,510	523,885	665,289	544,295
Sale of Assets	43,901	71,926	261,565	33,924	81,294
Contributed capital assets	6,300	10,500		169,987	
Development Charges Earned	12,616	22,137		600,614	587,659
Parkland Charges earned	65,753	281,062	161,718	81,864	101,150
Donation Income	2,487	68,902	6,221	6,492	4,140
Total	**17,923,727**	**20,117,458**	**19,423,755**	**20,622,327**	**21,546,839**

Figure 14. Historical Revenues by Source

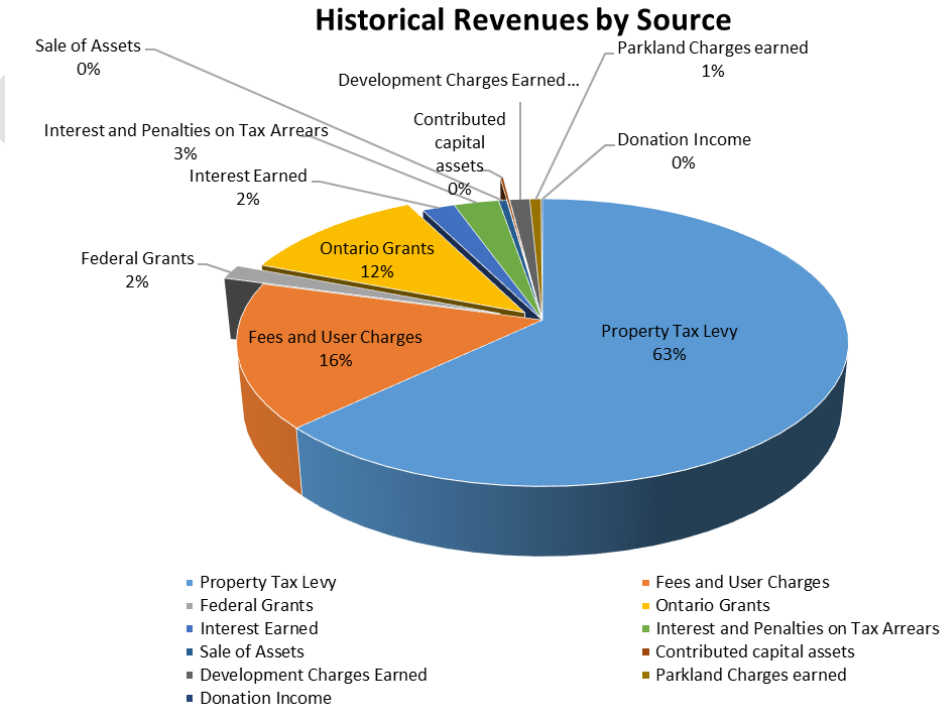
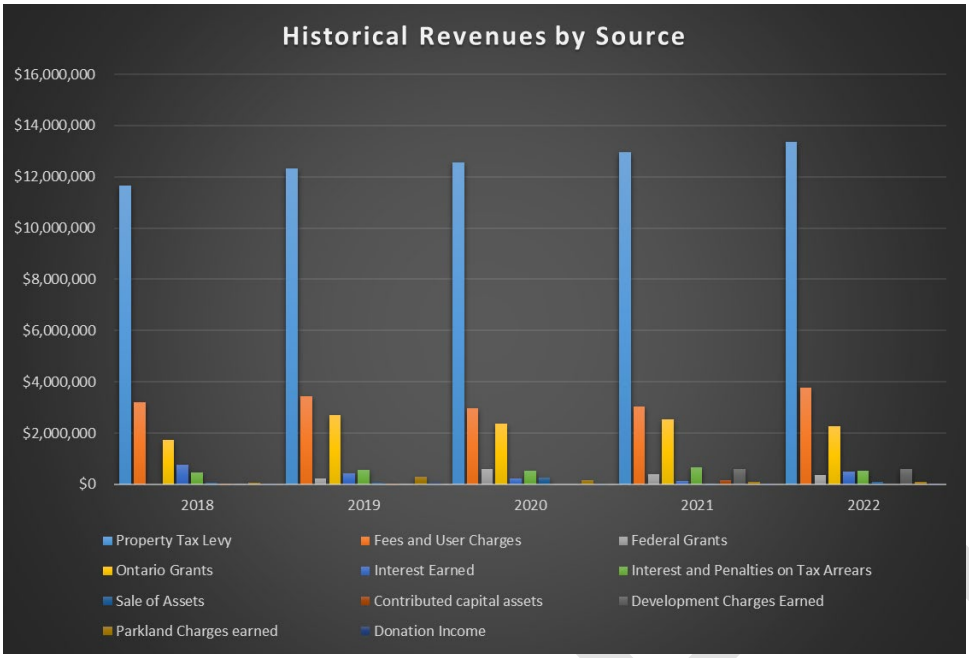


Figure 15. Historical Revenues by Source



Asset management activities involving major repair, rehabilitation and replacement of existing infrastructure assets have funding allocated through the Capital Budget. The funding sources for the Capital Budget are typically reserve funds which have accumulated revenue over the years from property tax, user fees, gas tax or sales of assets revenue sources.

From 2018 to 2022 the capital budget devoted to rehabilitation or replacement of existing assets (Table 38) averaged $ 3.98 million per year and ranged from $2.01 to $6.63 million.

Table 38 Historical Capital Budget Revenue for Asset Management of Infrastructure

2018	2019	2020	2021	2022
$2,011,201	$3.311,613	$3,394,089	$4,555,424	$6,615,359

The biggest funding source for rehabilitation or replacement of existing assets are the Assets Repair & Replacement Reserve funds. It is interesting to note that the Township engaged in debt financing for the first time in the recent past to fund the Streetlight LED conversion project based upon the business case that the savings in electricity will pay back the debt in a reasonable length of time.

One funding source that is significant but has been under-represented over the past five years is project specific grant funding. Since 2018, the Township has brought in approximately $240,000 in grant funding. Averaged out over this period, grant funding would amount to about $48,000 per year. However, the timing of grants is unpredictable and difficult to forecast. It should not be considered a reliable source of funding.

5.2.2 Reserve Funds

The Capital Budget describes and authorizes spending of funds on infrastructure replacement, rehabilitation and major repairs, and the sources of funds are different than the Operating Budget. All capital budget items are funded from reserve funds, each of which holds money for specific purposes. Some reserves are intended to accumulate money to pay for future asset maintenance. Others are used to stabilize the revenue demands where there is volatility in the amount of money needed each year, with the reserve growing in low demand years and being drawn down in higher cost years.

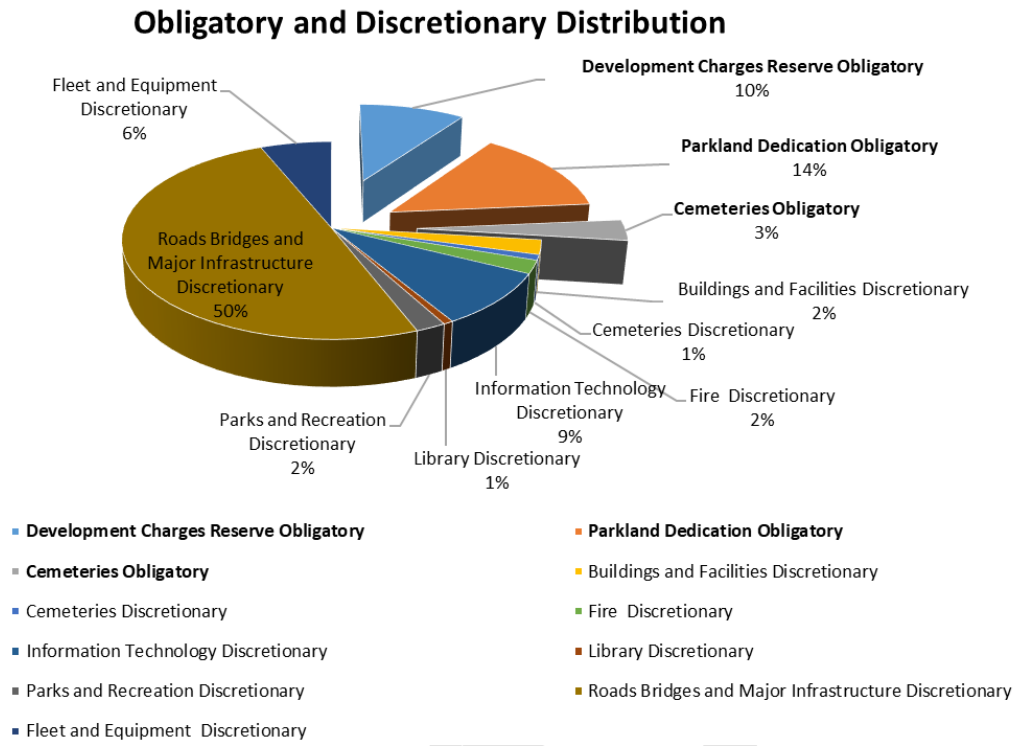
The use of reserves for growth assets are highly regulated with clear definitions of allowable uses. A small number of reserve funds can be used for building new assets associated with growth or for rehabilitation

and replacement of existing assets, based on direction from Council. Because growth reserve funds cannot be used for capital maintenance, rehabilitation, or replacement of existing assets, only the funds that can be used for existing assets are modeled in the next sections of the Asset Management Plan.

Table 39: Capital Reserve Funds

Reserve	Permitted Use	Description	2022 Balance
Development Charges Reserve	Obligatory Growth Related Assets	Contributions from developers are used to fund eligible growth related infrastructure	$1,499,446
Parkland Dedication	Obligatory Growth and Existing Assets	Contributions from developers dedicated for park or other public recreational purposes	$2,138,307
Buildings and Facilities	Discretionary Existing Assets	To provide funding for capital projects for replacement of existing assets and new items not eligible for funding from Development Charges.	$365,667
Cemeteries	Discretionary Existing Assets	To provide funding for capital projects for replacement of existing assets and new items not eligible for funding from Development Charges.	$137,726
Cemeteries	Obligatory Endowment	Perpetual care of cemeteries under the Townships care and control. Only interest can be used. Principal must be maintained.	$515,500
Fire	Discretionary Existing Assets & Service Expansion	To provide for repairs and infrastructure replacement of apparatus and equipment.	$333,377
Information Technology	Discretionary Existing Assets & Service Expansion	To provide funding for capital projects for replacement of existing assets and new items not eligible for funding from Development Charges.	$1,385,679
Library	Discretionary Existing Assets and Service Expansion	To provide funding for capital projects for replacement of existing assets and new items not eligible for funding from Development Charges.	$104,876
Parks and Recreation	Discretionary Existing Assets and Service Expansion	To provide funding for capital projects for replacement of existing assets and new items not eligible for funding from Development Charges.	$319,139
Roads Bridges and Major Infrastructure	Discretionary Growth & Existing Assets	To provide funding for capital projects for replacement of existing assets and new items not eligible for funding from Development Charges.	$7,666,942
Fleet and Equipment	Discretionary Existing and New Assets	To provide funding for capital projects for replacement of existing assets and new items not eligible for funding from Development Charges.	$956,260
Total Reserves At December 31,2022			**$15,422,919**

Figure. 16. Obligatory and Discretionary Distribution



5.2.3 Contributions to Reserve

The Operating Budget identifies annual contributions to the Reserves to maintain the capacity to fund projects identified in the 10 Year Capital Forecast. Annual contributions from 2018 to 2022 (projected) are identified in Table 40 for key reserve funding sources for funding asset management strategies.

Table 40: Historical Contributions to Reserve from Tax Levy - 2018 to 2022

Reserve Provisions	2018	2019	2020	2021	2022
Transfers to Reserve	2,020,261	2,414,999	3,417,882	3,558,990	3,559,000

5.3 Expenditures

5.3.1 Historical Expenditures

Through the annual Operating and Capital Budgets, the Township authorizes expenditures to manage our infrastructure assets through the different stages of their life cycle. The range of asset management strategies that are available to cost-effectively manage the Township's assets have been described in Section 4.

5.3.2 Operating Expenditures

The budgets allocate the resources the Township is applying to different asset management strategies. From 2018 to 2022 the largest budgeted expenditure ($9.3 million over five years) for both core and non-core assets were for the roadway system. The distribution of expenditures between operating and capital is illustrated. Currently, budgeted expenditures are not categorized according to the asset management strategies or lifecycle stages. There is an opportunity in the future to better align tracking of expenditures to the life cycle stages of the assets.

Table 41: Historic Operating Expenditures

Asset System	2018	2019	2020	2021	2022
Administrative Facilities	269,271	277,275	230,429	253,905	317,643
Culture Recreation and Sports	2,037,433	2,118,939	1,786,145	1,873,326	2,225,529
Emergency Services	1,371,100	1,334,774	1,334,156	1,360,019	2,626,200
Information Technology	453,317	681,335	625,987	463,316	477,900
Parking	0	0	0	0	0
Stormwater	83,567	52,681	172,210	115,682	52,476
Transportation	1,567,623	1,635,425	1,891,134	2,079,206	2,121,966
Vehicles and Equipment	534,772	621,578	592,333	844,922	709,715
Total	**6,317,083**	**6,722,007**	**6,632,394**	**6,990,376**	**8,531,429**

5.3.3 Capital Expenditures

The Council approved capital budget for each asset system from the previous five years is provided in **Table 42**.

Table 42. Historical Capital Investment Trend by Asset Type ($'000)

Asset System	2018	2019	2020	2021	2022
Administrative Facilities	306,774	1,927	31,950	174,826	183,067
Culture Recreation and Sports	51,309	577,607	419,397	440,819	572,937
Emergency Services	299,570	845,712	266,100	384,041	1,163,518
Information Technology	86,284	286,828	73,141	108,906	(278,987)
Parking	0	0	0	0	0
Stormwater	0	0	0	0	0
Transportation	1,143,089	1,054,182	1,928,356	3,158,418	4,581,411
Vehicles and Equipment	210,519	545,357	184,355	142,872	105,612
Total	**2,011,261**	**3,311,613**	**2,903,299**	**4,409,882**	**6,885,532**

Note: *Amounts exclude non-asset related budgets.

5.4 Financial Strategies

5.4.1 Funding Sources

Several financing strategies are 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 payment limit or 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, which is typically based on a full cost recovery model.

For the most part, the Township uses a combination of all of the above funding strategies depending on the specific project. It should be pointed out that the Township has traditionally had an aversion to the use of debt financing for the funding of projects.

Like most municipalities across Canada, the Township has experienced a dramatic decrease in funding available for municipal operations from the senior levels of government. This has resulted in significant increases in property tax rates. It should be noted however that despite these increases funding has not kept pace with the rate of inflation or deterioration and do not reflect the true cost of delivering the service. Therefore, staff have been tasked with the responsibility to actively seek alternative funding strategies in order to fund needed work and realize the greatest value for Township residents. These have been largely unsuccessful. As a consequence Council should not rely on grant funding in any significant way to fund the future maintenance of public infrastructure.

The Township uses short- and long-term analyses with the goal of developing sustainable capital plans and financing strategies. These analyses include 10-year capital budgets, and reserve fund forecasts.

5.5 Expenditure Forecasts

5.5.1 Key Assumptions

This 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;
- Installation dates, where they were unavailable, were assumed;
- Total replacement costs of facilities have been allocated based on the percentage allocation of Section E "Gross Building Costs – Representative Samples" from the Altus (2023). 'Yardstick for Costing: Cost Data for the Canadian Construction Industry' to the various sub- components (such as substructure, structure, exterior enclosure, partitions & doors etc.) due to the differing life expectancies of each component;
- All assets perform based on industry standard service lives;
- 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.

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 should include an allowance for the impacts of inflation where appropriate.

5.5.2 Forecasted Needs

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. Large quantities of asset construction during a short time span will require equally 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 expands on the current 10 year approach. Council should consider projecting out an 80 to 100 year forecast with a view to covering the entire lifecycle of their assets and allowing for the identification of such trends.

Funding and re-investment requirements were developed for each asset system. The investment forecast takes into consideration estimated service lives, and replacement costs to provide trends of costs to sustain the infrastructure in a state of good repair. The replacement trends can then be used to develop long-term (25-year) replacement requirements and average annual costs. The replacement costs are based on 2022 average tender prices, condition assessments, asset valuations, and insurance assessed values.

Figure 17 depicts the estimated annual capital investment requirements across the Township's entire asset portfolio over the next 25 years. The figure shows various spikes in the investment forecasts, which is typically due to large assets with high replacement values, 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 over the next 25 years to service the current and future needs is expected to be approximately $18.5 M per year.

Figure 17. 25-Year Lifecycle Investment Requirements – Overall

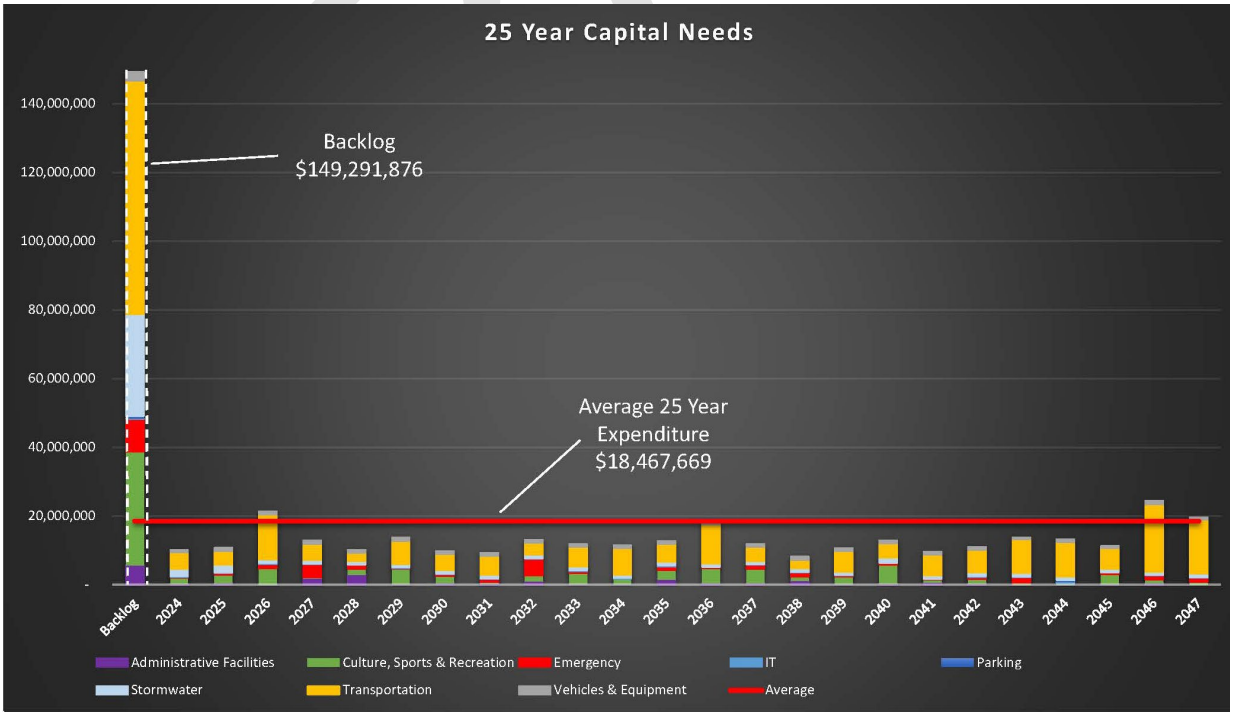


Figure 17 shows that there are currently deferred investment (backlog) needs of at least $149.3 M or 24.0 percent of total asset value. The 'deferred investment needs' refers to an outstanding capital need, which arose in the past, but has not been addressed (i.e. assets that fall within the poor and very poor rating

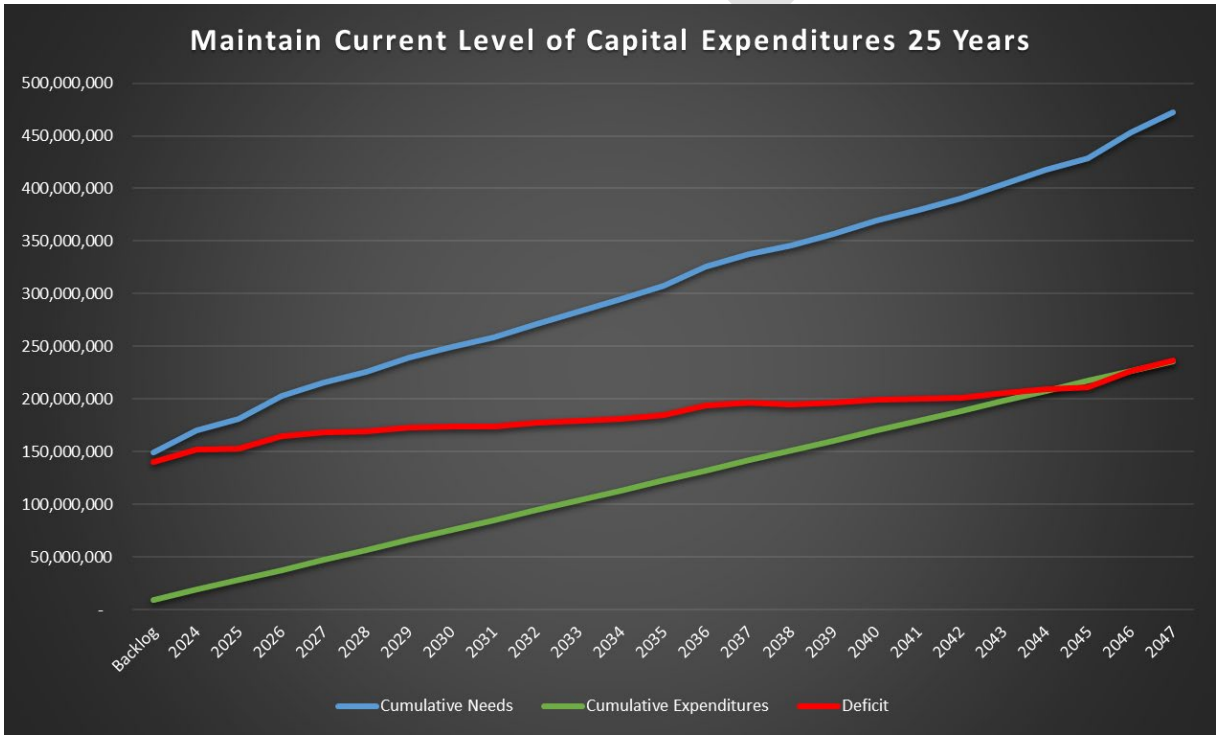
category because their remaining service life is below zero). This could be related to asset deterioration, capacity shortfalls or required service standard upgrades.

It is to be noted that Figure 19 does not include growth related needs. These needs should be included in future versions of the plan. If the analysis is to be expanded to identify the 100 Year Lifecycle Reinvestment Requirements, careful consideration will need to be given to the value of expansion for at least the first 25 years of the plan. To achieve this, it is imperative that the Township incorporate the findings from the recently completed master plans currently (Parks, Fire, Transportation) and ensure that these are coordinated in successive versions of the Development Charges Study. Beyond 2048 consideration should be given to inclusion of percentage allowance for growth related needs.

5.5.3 Growing Needs and Funding Shortfalls

Figure 18 illustrates the cumulative impact of maintaining the current levels of expenditure over the next 25 years. This analysis is based on 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 18: Impact of Current Level of Capital Investment



It is anticipated that the needs over the course of next 25 years will be approximately $460.2 M. Based on maintaining the current level of the re-investment in the infrastructure ($9.4 M per year), the backlog of unmet needs shows a steady increase from the current $149.3 M to a maximum of $224.2 M or 31.1 percent of overall asset value by 2047. This equates to an average annual increase of 1.64% compounded. The increase in the value of the backlog should be interpreted to be 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 impacts of the current reserve position. Therefore, the percentage 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, debt or grants and subsidies. In future versions of the plan, further analysis is be completed by asset class to evaluate options for funding.

5.5.4 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. In general, if 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. For example, consider a reduction in the frequency of servicing a community centre's HVAC system and a plan to run this item to failure. Lowering the frequency of inspections, and associated minor repairs, will result in an immediate cost reduction, allowing the funding allocated to this item to be reallocated to other initiatives. However, by reducing the maintenance, the performance of the system is also likely to be reduced. This can mean that occupant comfort will be reduced, resulting in an increase in complaints concerning temperature and humidity, or even higher frequencies of asset failures. All surrounding equipment and finishes will be exposed to higher levels of humidity, potentially resulting in quicker decay and failure. The asset itself will experience a shortened life span because critical issues may go unnoticed, or unresolved, and the HVAC system itself may fail unexpectedly, resulting in loss of revenue and negative public feedback.

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.

5.5.5 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 year the Township will conduct a level of service analysis which should include 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 areas of the budget with the least negative consequence.

5.5.6 Funding vs Needs Report Card

The second report card evaluation reflects the status of funding dedicated to improve the current condition of the asset through rehabilitation or replacement of the existing infrastructure. Infrastructure systems need funding that is dedicated, indexed, and long-term. The primary measure is the actual amount of funding provided versus the estimated investment required to meet or maintain the desired levels of service. The calculated ratio is then placed into one of five rating categories ranging from Very Good to Very Poor as shown in the table below.

Table 42: Report Card Rating Categories Based on Funding Levels

Rating Cat. Description	Criteria	Grade
Very Good	91% - 100% of the Funding need is supported.	A
Good	76% - 90% of the Funding need is supported	B
Fair	61% - 75% of the Funding need is supported.	C
Poor	46% - 60% of the Funding need is supported.	D
Very Poor	< 45% of the Funding need is supported.	F

Table 43: Funding Report Card

Asset System	Est. Ten Year Expenditure	Est. Ten Year Needs	% Needs Satisfied	Score
Administrative Facilities	2,875,000	6,428,000	44.7%	F
Culture Recreation and Sports	14,118,000	48,775,900	28.9%	F
Emergency Services	10,902,000	16,540,900	65.9%	B-
Information Technology	3,095,000	1,250,000	247.6%	A+
Parking	300,000	955,000	31.4%	F
Stormwater	1,146,000	24,902,250	4.6%	F
Transportation	33,859,000	122,816,400	27.6%	F
Vehicles and Equipment	7,755,000	15,476,500	50.1%	D-
Overall Grade	**$72,904,000**	**$237,144,050**	**30.7%**	**F**

The overall rating based on current levels of expenditure is F indicating that the Township is underfunding its infrastructure to a significant degree.

6 Improvement and Monitoring

One of the goals of this asset management plan is to establish a baseline of the current asset management practices, to inform a work plan for continuous improvement. Any assumptions made and opportunities identified have been documented to serve as the basis for continuous improvement. This section, presents the proposed continuous improvement program in terms of two components:

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

Where possible, the benefits and costs of the proposed actions are included to support planning processes.

6.1 Improving Future Asset Management Plans

The future improvement initiatives to minimize gaps in this asset management plan are categorized by section, and identified below:

6.1.1 Improvements to Existing Sections

Section 1: Introduction

- None at this time.

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;
- Expanding upon the 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 to improve predictive models.

Strides have been made through the implementation of the CityWorks system to document the state of the assets and to monitor the conditions on a more proactive basis. The data must be continually updated as part of the departments ongoing business practices if it is to remain valid and useful.

Section 3: Desired Levels of Service

Incorporate the following key sub-sections:

- Customer Research and Expectations:
  - Background and customer research undertaken and proposed approach to future

consultation; and
    - Details of how knowledge of customer requirements 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 City compares to other organizations.
- Desired Levels of Service:
    - Provide details on the level of service desired if different from what is being provided, and what options have been considered in determining that level of service; and
    - Provide details of the differences between current and desired levels of service and how these gaps will be progressively closed.

These will in large measure be addressed through the forthcoming asset level of service analysis planned for 2024. The onus will then be on Council and Staff to keep it current so that the it remains an accurate decision support tool for future plans.

Section 4: Lifecycle Management Strategies

Addition of the following sections:

- Non-Infrastructure:

o Detailed forecast and itemized list of non-infrastructure projects and initiatives.

- Operations and Maintenance:
    - Documentation of trends (i.e. past expenditures, complaints) and issues;
    - Maintenance decision making processes (planned and unplanned);
    - Defining maintenance strategies, methods to meet the required levels of service;
    - How maintenance tasks are prioritized;
    - Risks associated with alternative maintenance standards;
    - Forecast of planned and unplanned operations and maintenance work cost; and
    - Quantification of deferred maintenance and associated risks.
- Renewal/Replacements:
    - Define how replacements/renewals are identified and to what standards the assets are to be replaced (i.e. modes of failure, options for treatment, risk);
    - End of life projections; and
    - Define and document renewal decision making processes.
- Expansions:
    - Selection criteria: Formal procedure to rank asset creation/acquisition projects.
    - Capital Investment strategies: Strategies to ensure the new asset best meets the needs of the organization and are completed on time and to the required standard and cost, covering:
- Value management during the design phase;
- Procedures and criteria for assessment of design options (including consideration of lifecycle costs, optimized renewal decision making and risk assessment);
    - Project management procedures and project review;
    - Quality assurance and audit trails for design and project management; and
    - Risks associated with alternatives and how these will be managed.
    - Disposals:
        - Forecast future disposal of assets including timing and costs; and
        - Cash flow forecast of income/expenditure from asset disposal.

Life cycle management strategies will largely depend on the early adoption of maintenance standards and policies across the spectrum of all assets. Some efforts in this regard will be initiated early in 2024.

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 hoe 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 growth forecasts which affect the management and utilization of assets, and will include:

- Demand Drivers: Factors influencing demand – anticipated changes in customer expectations, changes in technology, population changes, economic changes, etc.
- Demand Forecasts: Details of projected growth or decline of demands on services.
- Demand Impacts on Assets: Impacts of changes in demand on assets (utilization/capacity, load/condition).
- Demand Management Plan: Non-asset solutions available as alternatives to asset-based solutions (i.e. demand management, insurance, managed failures).
- Asset Programs to Meet Demand: Major programs and costs. Details to be linked with the “Expansions” categories in the Lifecycle management plan.

Risk Management Plan (to be added before Section 5: 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):

- Critical Assets: How critical assets are identified and managed.
- Risk Assessment: Approach to assessing risks, referencing an adopted enterprise risk management framework; and Top risks and how they will be managed.
- Risk Management and Resilience: A summary of the approaches and strategies to manage the risks and resilience (such as business continuity planning, new infrastructure, assessments etc.); and A summary of the key outcomes of the above, including cost/benefit analysis.

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 strengths and weaknesses across a range of domains. This will help guide the Township towards future enhancements contributing to the path to maturity.

Figure 19 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 19. Current and Target Asset Management Maturity based on the IIMM and ISO55000

A formal review with each asset system should be planned to be completed in 2024 as part of the update of the corporate asset management policy.

As an outcome of the internal reviews and development of this plan, key opportunities for asset management improvement initiatives to advance the Township's alignment with industry best practices have been identified. These opportunities have been used as the basis to develop the Corporate Asset Management work plan presented in the next section. Each opportunity, the targeted benefits, the proposed timeline, and estimated costs are presented in **Table 44**.

Table 44. 2023 to 2025 Asset Management Work Plan Initiatives

2023 Work Plan (Complete With the Adoption of This Plan)				
ID	**Work Plan Item**	**Timing**	**Targeted Benefits**	**Respons.**
1.1	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
1.2	Corporate Asset Management Plan	2023	▪ Expand Asset Management Plan to cover all assets under Township control.	Internal
2024 Work Program				
ID	**Work Plan Item**	**Timing**	**Targeted Benefits**	**Respons.**
2.1	Level of Service Analysis	2024	▪ Analysis of activities necessary to keep infrastructure in good state of repair ▪ Prepare long term capital forecasts a minimum of one lifecycle	External
2.2	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*
2.3	Asset Management Policy Update	2024	▪ Updates to incorporate any best practices, strategic document, or regulatory changes.	Internal*
3.3	Financial Plan Development	2024	▪ Consolidate long term needs ▪ Identify funding alternatives ▪ Financial plan development for all assets	Internal*
2025 Work Program				
ID	**Work Plan Item**	**Timing**	**Targeted Benefits**	**Respons.**
3.1	Corporate Asset Management Plan	2025	▪ 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*

* Council may wish to outsource future updates of the plan depending on the skill sets of future staff resources.

7 Conclusions

The Township of Muskoka Lakes Corporate Asset Management Plan documents the current processes and practices in place to maintain the Township's services over the next 25 years. Asset management practices within some asset groups are more advanced than others however overall the Townships asset management practices are relatively early in their development. A number of strategies are identified to advance the overall level of practice over the next few years.

Table 45 provides an overview of the current value of the assets under Township jurisdiction and an assessment of their condition. Overall, the Township's asset portfolio has approximately 54.2 per cent remaining service life (weighted by replacement value). Of the portfolio, approximately 11.3 per cent, or $70.1 M in assets are within the poor and very poor rating categories and are beyond their typical service lives.

Table 45. Asset System Ratings Based on Service Life and Condition

Asset System	Asset Category	Asset	Replacement Cost	% Life Remain	Condition State	% of Assets Poor or Very Poor	Replace Value Poor and Very Poor Assets
Administrative Facilities	Civic	Admin Building	$12,229,000	34.2%	Poor	11.7%	$1,432,037
	Medical	Health Hub	$2,232,600	68.1%	Good	0.0%	-
	Works Yards	Garages, Sand, Salt Sheds	$12,438,900	40.5%	Poor	7.7%	$955,846
Culture, Sports, and Recreation	Cultural Facilities	Cemeteries	$88,300	41.3%	Poor	0.0%	-
		Community Centres	$45,859,000	33.8%	Poor	4.6%	$2,156,274
		Docks and Wharves	$6,240,000	31.9%	Poor	22.0%	$1,370,393
		Library	$7,215,500	26.7%	V Poor	0.0%	-
	Recreation Facilities	Parks	$11,767,000	78.6%	Good	0.2%	$22,190
		Parks Buildings	$2,933,500	35.4%	Poor	4.6%	$93,628
		Trails	$728,000	49.7%	Fair	0.0%	-
	Sports Facilities	Arenas	$29,464,800	5.4%	V Poor	5.8%	$1,720,793
		Sport Fields Etc	$1,545,500	28.2%	V Poor	3.2%	$50,110
Emergency Services	Fire	Fire Halls	$25,758,800	33.5%	Poor	4.4%	$1,134,584
		Fire Vehicles & Equipment	$10,969,000	45.7%	Fair	0.0%	-

Information Technology	Hardware Network	Computers, Peripherals	$773,400	40.2%	Poor	37.4%	$289,582
		Connectivity / WiFi	$ 85,700	2.6%	V Poor	99.1%	$84,953
	Software	Operational	$445,500	55.4%	Fair	22.4%	$120,000
Parking	Surface Parking	Parking Lots	$407,100	38.1%	Poor	4.5%	$18,400
		Street Parking	$430,900	0.7%	V Poor	92.8%	$399,900
Storm Water Management	Drainage Systems	Rural	$41,703,000	28.6%	V Poor	0%	$0
		Urban	$4,058,500	54.5%	Fair	0%	$0
		Dam	$7,325,000	0.0%	V Poor	100%	$7,325,000
Transportation	Bridges and Culverts	Bridge	$19,775,000	47.7%	Fair	17.8%	$3,512,500
		Culverts (>3.0m)	$5,567,500	45.4%	Fair	27.1%	$1,510,000
	Roads	Hard Top	$236,612,000	70.5%	Good	40.3%	$30,500,900
		Loose Top	$119,900,700	67.5%	Good	53.2%	$14,984,100
	Railway Crossings	Protected	$600,000	48.3%	Fair	0.0%	-
		Unprotected	$100,000	25.0%	V Poor	0.0%	-
	Sidewalks	Concrete	$400,400	35.6%	Poor	0.6%	$2,429
		Pavers	$48,300	26.5%	V Poor	0.0%	-
	Signs	Informational	$124,800	46.9%	Fair	3.2%	$1,200
		Regulatory	$255,000	29.3%	V Poor	6.0%	$15,300
		Warning	$156,600	18.2%	V Poor	53.6%	$84,000
	Street Lighting	LED	$548,300	76.3%	Good	0.0%	-
		INC	$8,000	30.0%	Poor	0.0%	-
		Poles	$1,425,000	52.5%	Fair	0.0%	-
Vehicles and Equipment		Vehicles and Equipment	$ 9,990,500	36.3%	Poor	24.3%	$2,432,000
		Total	**$620,211,100**	**54.2%**	**Fair**	**11.3%**	**$70,129,226**

In 2024, it is proposed that the Township embark on a level of service analysis the outcome of which will be to define levels of service for each asset category 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, risk and costs to provide the service. This will allow the Township to then accurately forecast its future financial obligations. The Township should also developing tools and techniques to predictively model levels of service over time.

This plan also highlights lifecycle activities which are tied to lifecycle funding forecasts. The activities were categorized into non-infrastructure, maintenance, renewal/rehabilitation, replacement, disposal, and expansion activities.

A projection of the current value of deferred capital needs (backlog) has been completed. The analysis demonstrates a current value in excess of a $149.4 M or 24% of total asset value. A projection of the impact of maintaining current funding levels (currently the only measure of level of service) on the value of the deferred needs over the next 25 years was completed. If the current situation remains unaltered the value of deferred capital needs can be expected to increase to over $224.2 M or 31.1 % of total asset value (2022 values). At the same time as reported under separate reports, provisions for reserve remain well below the

sustainable level to meet the needs of the current levels of capital funding. 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 taxation, existing reserves or grants, debt and subsidies. In future versions of the asset management plan, further analysis needs to be completed by asset system to evaluate options for funding. An effort should be made to diversify revenues and reduce the reliance on property taxes as the primary source of income. Other alternatives that should be considered include the disposal of assets that may not be consistent with the needs and future direction of the municipality. It should be noted however that failure to address the issue will result in higher operating expenses to maintain levels of service above the minimum regulated levels.

Council has adopted a series of master plans to chart a course for the future of the Township. Many of the recommendations involve the creation of new infrastructure or pursuing alternative directions that may not included in the scope of the asset management plan. At a very high level the estimate of the value of these could be as much as $75.9 M over the next 25 years

One of the goals of this asset management plan was to establish a high-level baseline of the asset management practices which will inform a work plan to continually improve the asset management maturity. Throughout this process, any assumptions and opportunities have been documented to serve as the basis of a continuous improvement program. This plan presents a proposed continuous improvement program in terms of two components:

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

Asset management provides 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 systematically developed, embedded and integrated into day to day operations across all asset-owning departments, if the true benefits are to be realized.