ASSET MANAGEMENT PLAN

TOWNSHIP OF RYERSON

October 2021

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Executive Summary

Tangible capital assets play a key role in the provision of municipal services, both directly by providing infrastructure for public use and indirectly by enabling staff to efficiently carry out their day-to-day responsibilities. It is therefore a primary responsibility of municipal Council and management to prudently manage these assets and ensure the Township can provide municipal services in a fiscally responsible and sustainable manner.

The Township of Ryerson's (the Township) Asset Management Plan (the Plan) documents information relevant to the management of the Township's capital assets. The overarching purpose of an asset management plan is to aid municipalities in making cost effective decisions with respect to operating, maintaining, renewing, replacing, and disposing of their assets. This plan will improve the Township's decision-making process by using a long-range vision to dictate resource allocations and using performance-based analysis to determine if desired goals and objectives are being met.

In November of 2003, the National Guide to Sustainable Municipal Infrastructure published a *Best Practice for Municipal Infrastructure Asset Management*. This guide provided a series of questions which serve as the framework by which an asset management plan can be developed:

- What do we have and where is it?
- What is it worth?
- What is its condition and expected remaining service life?
- What is the service level expectation and what needs to be done to achieve that level?
- When do we need to do it?
- How much will it cost and what is the acceptable level of risk?
- How do we make it sustainable?

All of the Township's assets are, or will be, included in the Plan, including its proportionate share of the assets of its shared waste management facility. The historical cost of the Township's assets is approximately $12.1 M. The replacement cost of the Township's asset portfolio is estimated to be $76.6 M. More detailed information on the quantity and quality of assets can be found in the State of Local Infrastructure section of the Plan.

The Plan includes discussions of best management practices related to each asset class as well as the "preservation management" approach to asset management that has been adopted in principle by the Township. Although this approach has been shown to result in the lowest overall costs of ownership in the long-term, over the Plan period it is not financially feasible to implement to any great extent.

In this version of the Plan, the current levels of service and their related costs for all asset classes have been identified. Future versions of the Plan will incorporate target levels of service for a ten-year planning period.

In order for the Plan to be effective, it must be integrated with financial planning and long-term budgeting. The financing section of the Plan includes a discussion of the current estimated funding surplus, and presents a 10-year capital budget that has been limited in scope to the most critical projects. For the 10 years covered by the Plan, the projected total cost to replace and maintain existing assets is $13.5 M, and the total municipal expenditures related to financing past, current, and future assets is $14.8 M.

To finance these expenditures, the Township will employ a strategy to use debt financing, as required, to supplement municipal funds derived from property taxation, but will strive to limit borrowing to a "low risk level" as defined by the Ministry of Municipal Affairs. The financial strategy also incorporates an annual tax levy increase in line with the inflation rate. An additional annual capital levy of 1% may also be considered, and would be necessary if the "preservation management" strategy described herein is to be implemented to any meaningful extent, but is not included in this plan's 10-Year Capital Budget.

This financial strategy is expected to produce the funds necessary to finance all of the capital expenses budgeted for the 10-year term of the Plan, as well as begin replenishing reserves for future capital needs. However, the strategy does not produce sufficient funds to begin the implementation of the "preservation management" approach. Further work is required to align the targeted service levels with the finances available to the Township.

This Plan has been prepared by the Treasurer, with input from the Roads Supervisor and Clerk, and builds on a previous version of the Plan prepared by D.M. Willis Associates Limited. It follows the guidelines set forth by the *Ministry of Infrastructure- Building Together: Guide for Municipal Asset Management Plans* and has been endorsed by Council as an evolving approach to asset management within the Township.

The Plan will be subject to revision as the Township works within its limitations and identifies specific challenges and/or opportunities for improvement. A comprehensive review will be undertaken every five years, at a minimum, to comply with the current Provincial requirements.

The Ontario Government has begun regulating asset management planning as part of a holistic approach to infrastructure management. Through the creation of O. Reg. 588/17 under the *Infrastructure for Jobs and Prosperity Act*, the Province has established a series of dates by which the Plan is to be updated and integrated into municipal planning. The known requirements, and their proposed timelines, are listed in the following table.

Completion Date	Requirements
July 1, 2019	• Adopt a Strategic Asset Management Policy
July 1, 2022	• Update the Plan for core infrastructure assets (roads, bridges, culverts, water and wastewater), including: o Current levels of service; o Inventory analysis; and o Ten-year estimate of expenditures required to maintain the current levels of service
July 1, 2024	• Update the Plan for all infrastructure assets, incorporating the same information as above for the core assets • Meet Provincial reporting requirements regarding levels of service and capital financing sources
July 1, 2025	• Incorporate the following for all infrastructure assets: o Proposed levels of service for a 10-year period; o Updated inventory analysis; o Lifecycle management strategy; o Financial strategy; and o Plan for addressing funding shortfalls
Ongoing	• Review, and update as necessary, the Strategic Asset Management Policy every five years commencing July 1, 2019 • Update the Asset Management Plan every five years • By May 31, report to the Province any time the Plan is updated • Council conducts an annual review of asset management progress, commencing the year after the July 1, 2024 requirements have been incorporated into the Plan. This review is to include: o Progress in implementing the Plan; o Factors impeding the Township's ability to implement the Plan; and o A strategy to address any factors identified

As the first step in complying with O. Reg. 588/17, in June of 2019 Council adopted the Strategic Asset Management Policy. This policy serves as a high-level overview of the principles governing asset management planning, the roles of Council and staff in developing, implementing, and managing Plan targets, and the alignment of the Plan with other Township policies and by-laws. A copy of the policy that was in effect at the time of writing has been attached as Appendix H.

1.0 Introduction

1.1 About Ryerson

Ryerson is a small rural township located in Northern Ontario, just north of Huntsville in the District of Parry Sound. The Township covers a territory of 188 km^2, and borders the Municipality of Magnetawan, Township of Armour, and Township of McMurrich-Monteith. The most recently published census data (2016) reports 580 private dwellings and a population of 648, an increase of 2.2% over the 5-year census period. Approximately 48% of the households are seasonal residences. Over the 10-year planning period, the Township is not expected to grow significantly, and as a result, expansion of its capital asset base is not anticipated.

The Township jointly operates a landfill, fire department, arena, and library through a shared services arrangement with the neighbouring Township of Armour and Village of Burk's Falls. It also engages in regional economic development through the Almaguin Community Economic Development consortium and provides building services to residents through a regional Joint Building Committee.

1.2 Purpose of an Asset Management Plan

The quality of life residents enjoy is directly related to the condition of municipal infrastructure and the assets used to deliver municipal services. Asset management planning allows municipalities to plan for the long-term maintenance and replacement of their assets, so that desired service levels can be met at the lowest lifecycle cost. Through O. Reg. 588/17, the provincial government has mandated the preparation of an asset management plan. This Plan will aid the Township in making appropriate financial decisions and investments as part of its annual municipal budget decisions. A carefully prepared, effectively utilized Plan should aid in moving from an ad-hoc, informal approach to the management of assets to a data-driven approach that formally recognizes the connection between levels of service, cost, and risk.

This Plan is to serve as a guidance document for the Township's use in developing its annual budgets and long-range financing plans as well as in the development of tax levy rates and other related revenue generators. This Plan is not intended to replace normal budgeting procedures, but rather to support budgeting decisions and assist in ensuring the long-term viability and financing of the Township's most costly assets.

Well-maintained infrastructure is important to the growth and development of the Township as set out in the goals of the Township's Official Plan. The Official Plan aims to "provide a level of municipal services consistent with the basic needs and financial resources of the Township and its aging population and to encourage growth and diversification of the economic base of the Township."[1] It is the intent of the Official Plan to encourage development that is compatible with the character, role, and permitted uses of agricultural, rural, and the Township site areas, as well as to promote the

[1] Township of Ryerson Official Plan (2012), p. 1-5.

continued functioning of natural systems. It is essential that the natural beauty and environmental resources, considered key factors in the growth of the tourism sector, are not damaged by future development.

Well maintained roads and bridges facilitate the movement of goods, the provision of services-notably emergency services- and the transport of people to work, school, recreation, and other facilities. They are essential to attracting economic development through the transport of commodities to market and by providing access to tourism and other amenities offered in the Township.

The state of local infrastructure also reflects on the image of the Township to its residents and visitors. Poorly maintained infrastructure conjures a negative image and may detract from investment in the Township. Ratepayers may question the value for money they receive if services do not align with public expectations.

Consequently, the development of a sustainable Asset Management Plan will facilitate the achievement of the vision outlined in the Official Plan.

1.3 Evaluation and Improvement of the Plan

As part of the Plan, Levels of Service have been developed for each of the primary asset groups. The Levels of Service are considered the 'expectation' or 'target' for the management of various assets. The Levels of Service also provide a measuring stick against which the Township can assess the relative success of their management practices, financial investment levels, and the overall suitability of the Plan.

A comprehensive review of the Plan shall be undertaken every five years, as a minimum, or on an as-required basis. This review will include an update to the state and condition of infrastructure inventory through such activities as the bi-annual Ontario Structure Inspection Manual (OSIM) reporting and regular road evaluations. The updated condition information will be used to update the Plan's financial forecasts to incorporate changes in capital expenditure requirements.

As an example, the average road network condition rating shall be recalculated with each Plan update. The calculated average condition rating will be compared against the Levels of Service target values and an assessment made as to whether revisions to the Plan are required to meet the desired Levels of Service. Alternatively, adjustments to the Levels of Service may need to be considered where insufficient funding or alternate priorities exist. The Plan must remain flexible for the Township to respond to the changing needs of its constituents and of the infrastructure itself.

An asset management plan that is not adhered to, or updated infrequently, will quickly become obsolete and be of little or no value to the Township. Staff are responsible for periodically reviewing the mechanisms by which the Plan is compiled and updated, as part of the goal to continuously improve the accuracy and efficacy of Plan data.

Based on a preliminary review of the processes used to prepare this and previous iterations of the Plan, a significant area for improvement would be to implement strategies or practices which facilitate ongoing data collection and the maintenance of such data within an asset management database. Appropriate asset management decisions cannot be made without the availability to timely, accurate, and relevant data. The following are specific sources or uses of data which could be improved in future versions of the Plan:

1. Condition data: actual field condition data is the most meaningful when assessing and planning for future requirements. In the absence of this, one can use age as a proxy to project the timing of future requirements. In future versions of the Plan, an attempt should be made to collect field condition data for all assets where practical.
2. Asset components: in the asset ledgers, some assets are not sufficiently broken down into components with distinct useful lifespans. As the components of major assets often do not depreciate at the same rate, failing to identify useful lives and replacement costs for each component could result in significant unanticipated capital expenditures being incurred. The Township needs to ensure that, where applicable, assets are segmented into their major components as they are added into the ledger.
3. Replacement values: estimated replacement values play a key role in the Plan; they form the basis for the financial forecasts by establishing future investment requirements. A variety of methods have been used to estimate replacement cost, the least reliable of which is inflating historical cost based on an inflation index table. A more accurate replacement cost can be estimated by using current market values or recent purchase data, and should be used wherever feasible in future iterations of the Plan.

Best practices for infrastructure management are continuously being refined. As staff become aware of new and better mechanisms for asset preservation, these should be incorporated into planning and maintenance activities. The ability of the Township to leverage its knowledge of infrastructure will greatly enhance its ability to meet the needs of residents in a sustainable manner.

2.0 State of Local Infrastructure

A useful Asset Management Plan cannot be created without first developing an understanding of the assets owned by the Township, the condition of those assets, and the funds required to achieve long-term sustainability. This section begins by providing a brief overview of the state of the Township's infrastructure portfolio using high-level asset and financial indicators. A more detailed review of each asset class is subsequently provided.

2.1 Replacement Cost by Asset Category

The following table provides a brief overview of the replacement costs for all tangible capital assets owned by the Township. As of December 31, 2020, the municipality's total value of assets owned was approximately $76.6 million.

Asset Category	Replacement Value
Roads	$66,998,720
Bridges and Culverts	$3,795,000
Buildings	$1,865,137
Vehicles	$1,934,377
Machinery and Equipment	$93,356
Shared Service Assets	$1,759,340
Other Assets (Land Improvements, Computer Hardware/ Software)	$151,015
TOTAL	**$76,596,945**

2.2 Overall Asset Condition

As mentioned previously, there are many methods that may be used to assess the condition of assets, with field condition data providing the most relevant information and age-based estimates providing a simple, but less useful, approximation. Although field data is generally superior, the lack of a standardized approach to assessing some assets means that an age-based approach will be used in certain circumstances.

O. Reg. 588/17 requires that the municipality use recognized and generally accepted engineering practices, where appropriate, to assess the condition of assets. For core assets, and more specifically roads and bridges, this process is quite simple; roads are classified using a pavement condition index[1] or structural adequacy index, depending on the surface type, and bridges are professionally assessed using a bridge condition index[2] in the bi-annual OSIM reporting. For other assets, where industry standards for

[1]Pavement Condition Index (PCI) rates the severity and density of 15 specific distresses in pavement
[2]Bridge Condition Index (BCI) is calculated based on the condition of elements of the bridge and represents a ratio of the bridge's current value to its replacement value,

condition assessments do not exist, techniques needed to be developed to determine an accurate approximation of quality. Changes to these assessment methods may be required as interpretation of the regulation continues to evolve.

The rating scale used to determine asset conditions is outlined in the following tables. Table 2 provides a summary of the range of values that define each tier in the condition rating scale. Table 3 indicates the source of condition data used for each asset class.

Table 2- Condition Rating Criteria

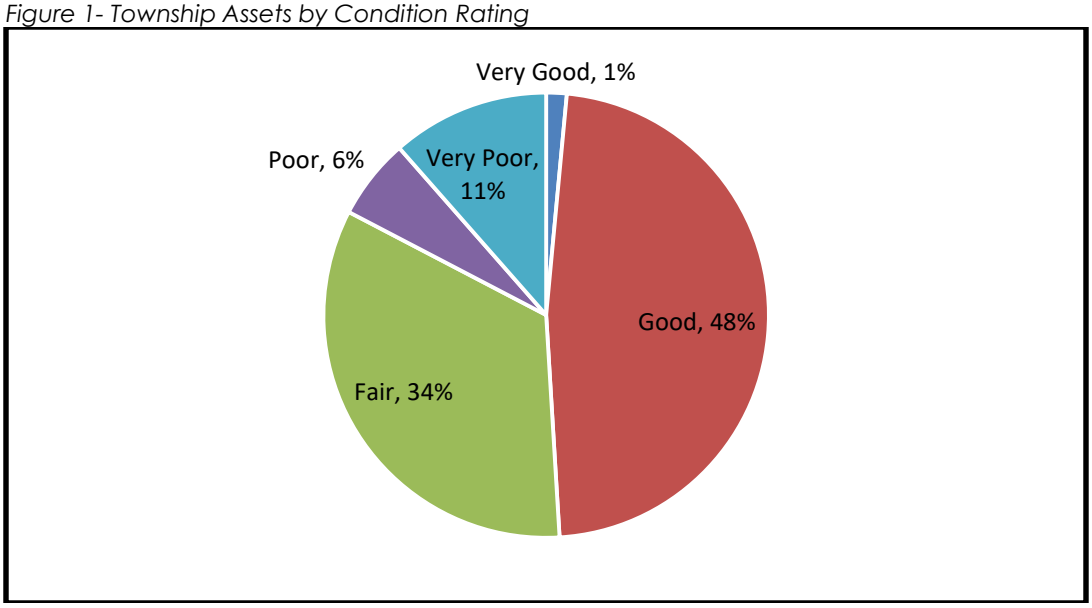
Condition Rating	Condition Description – General	Index/Age Based Measure	Action Required
Very Good	No noticeable defects/new or recently rehabilitated	Age - <10% of lifespan Index-based – 9 to 10 (90 to 100) Fleet - <50,000 km or 2,000 hours BCI- range of 80-100	No action required other than normal maintenance
Good	Only minor deterioration or defects	Age – 10% to 49% of lifespan Index-based – 6.5 to 8.9 (65-89) Fleet - <100,000 km or 5,000 hours BCI – range of 70-79	Normal and preventative maintenance required Nothing major anticipated within the next 5 years
Fair	Some deterioration evident but function not significantly affected	Age – 50% to 74% of lifespan Index-based – 4.5 to 6.4 (45-64) Fleet - <200,000 km or 10,000 hours BCI – range of 60-69	Minor rehabilitation expected within the next 5 years
Poor	Serious deterioration in at least some components, function is inadequate	Age – 75% to 100% of lifespan Index-based – 3.0 to 4.4 (30-44) Fleet - <400,000 km or 15,000 hours BCI – range of 40-59	Major/Minor rehabilitation or replacement
Very Poor	Failed asset, no longer functional	Age - > life expectancy Index-based – 0 to 2.9 (0-29) Fleet - > 400,000 km or 15,000 hours BCI- range of 0-39	Replacement

Table 3- Sources of Condition Data by Asset Class

Asset Class	Component	Source of Condition Data
Roads Network	Paved Roads	Pavement Condition Index
	Gravel Roads	Structural Adequacy Index
	Other Road Components	Age
Bridges and Culverts	Bridges	BCI through OSIM Reporting
	Culverts	BCI through OSIM Reporting
Buildings	All	General Condition Description
Equipment	All	Age
Vehicles	Fleet	Kilometers or Hours
	Other	General Condition Description
Other Assets	All	Age

Based on this evaluation criteria, the following chart illustrates the proportion of Township assets in each condition rating tier. Approximately 49% of all assets are in good to very good condition, whereas 11% of assets are in very poor condition and require immediate replacement.

Figure 1- Township Assets by Condition Rating



2.3 Replacement Financing Requirements

The replacement financing requirement presented below is an approximation of the amount, based on current estimated replacement costs and life expectancies, that the Township should allocate each year so that assets can be replaced upon reaching the end of their useful lives. Table 4 illustrates the annual funding requirements by asset category as of December 31, 2020. Using 2020 replacement costs, the Township should allocate approximately $1.4 million each year to meet capital replacement requirements for all assets that are currently owned.

Table 4- Annual Requirements by Asset Category

Asset Category	Funding Requirement
Roads	$1,104,412
Bridges and Culverts	$63,250
Buildings	$46,628
Equipment	$6,244
Vehicles	$118,019
Shared Service Assets	$75,790
Other Assets	$7,551
TOTAL	**$1,421,894**

Note, however, that the above figure is significantly skewed by the cost of road bases. The majority of the road bases in the Township were developed in the early 1900s, and records regarding their construction costs are not available. As a result, engineering estimates have been used to develop replacement costs. However, it is important to note that road bases will never truly need to be replaced; although some repairs will need to be made, the costs associated with engineering design, excavation, and blasting, among others, will not recur. It therefore makes sense to consider the annual funding requirement exclusive from road base replacement, to provide a more accurate estimation of long-term capital needs. The following table provides an illustration of the annual funding requirement, excluding the cost of road bases.

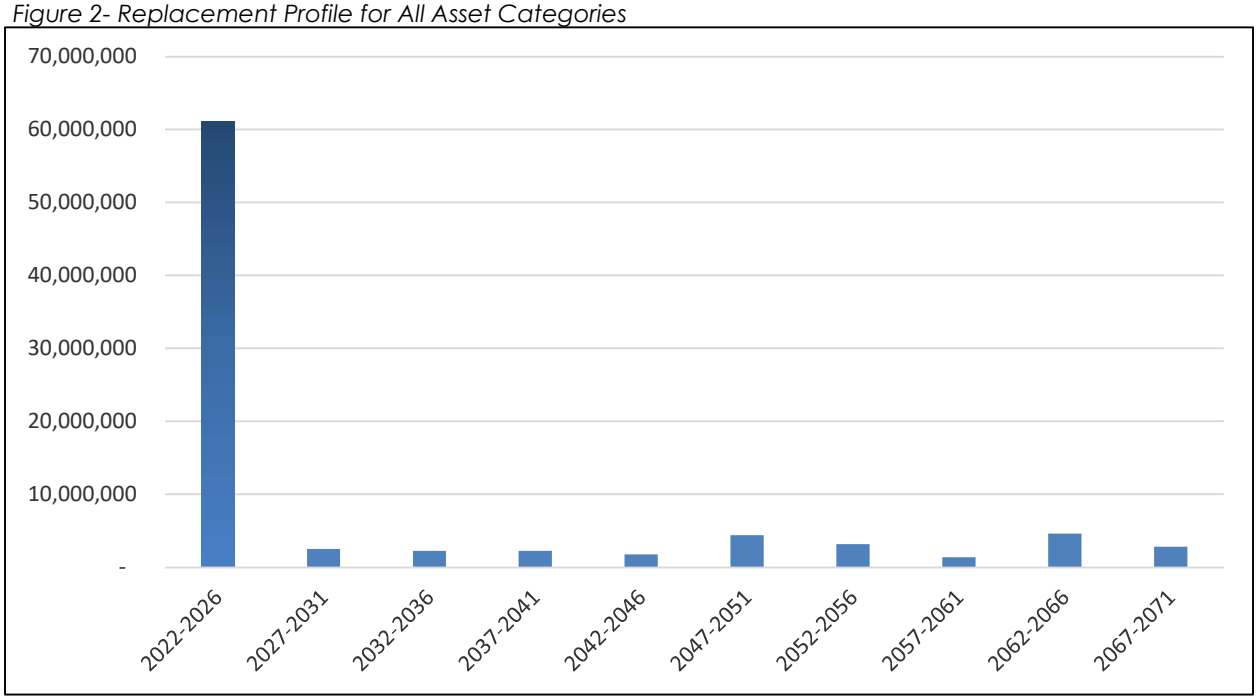
Table 5- Annual Requirements by Asset Category- Excluding Bases

Asset Category	Funding Requirement
Roads	$239,840
Bridges and Culverts	$63,250
Buildings	$46,628
Equipment	$6,244
Vehicles	$118,019
Shared Service Assets	$75,790
Other Assets	$7,551
TOTAL	**$557,322**

2.4 Asset Replacement Requirements

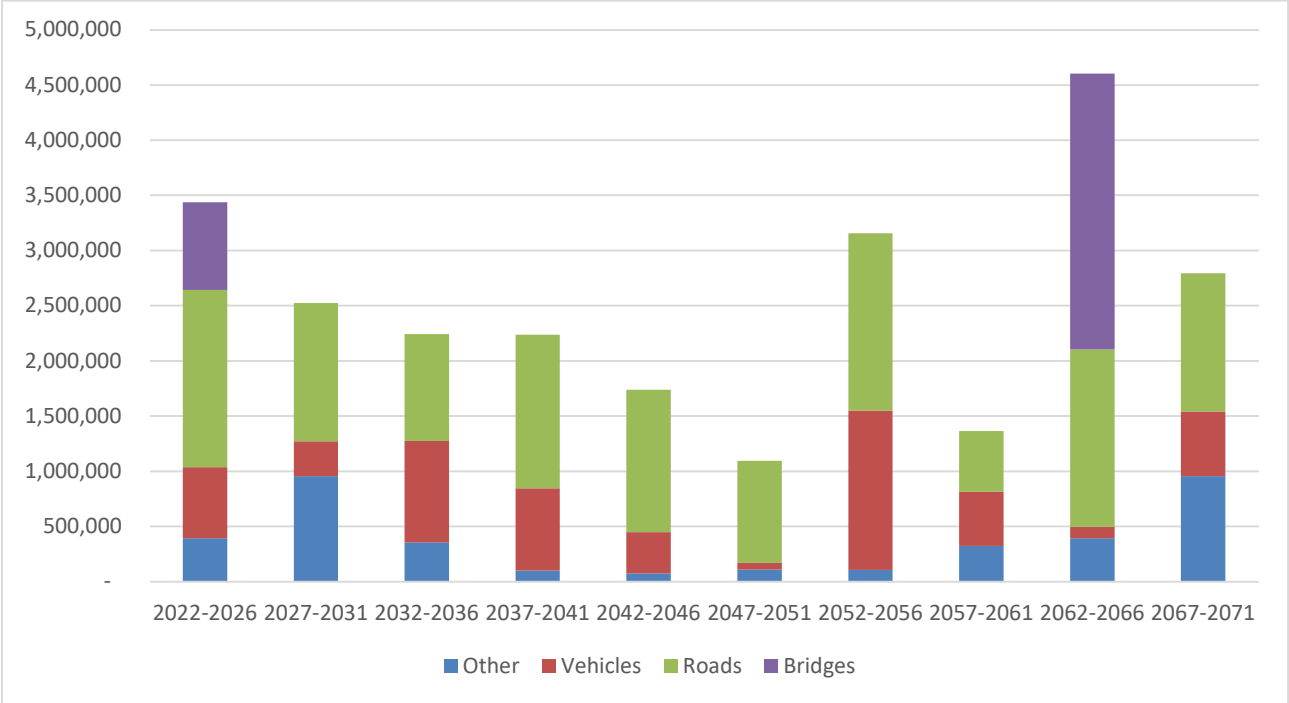
The following chart provides a long-term outlook of the Township's asset replacement needs based on maintenance of the existing asset portfolio and each asset's anticipated useful life. The backlog represents the total investment in infrastructure that has been deferred over previous years, and generally represents the value of assets that remain in operation beyond their useful lives.

Figure 2- Replacement Profile for All Asset Categories



Again, excluding road bases, the forecasted replacement needs are illustrated in the following table.

Figure 3- Replacement Profile for All Asset Categories- Excluding Road Bases



The following sections provide a more detailed overview of the assets in each class.

2.5 Roads

In 2020, the Township undertook a Road Needs Study to inventory and assess the condition of its road infrastructure. The Township's road network spans a total of 219.9 lane km, entirely within a rural setting, and can be broken into two categories by surface type: gravel and low class bituminous (LCB). Per the standards prescribed in O. Reg. 239/02 Minimum Maintenance Standards for Municipal Highways, 46% of the road network is considered Class 6 and therefore not subject to the standards imposed in the regulation. Only two roads, Midlothian and Nipissing, are categorized as Class 4. Additional information about the roads is presented in Table 6 below.

Table 6 - Road System Summary

Road Type	AADT	Length (km)	Average Condition Rating	Historical Cost (Dec 2020)	Net Book Value (Dec 2020)	Estimated Replacement Cost	Average Asset Age / Useful Service Life (Years)
Gravel (Loose Top Gravel/Earth)	All	189.5	6.2	5,041,297	1,103,674	56,470,014	7.5
	0-49	89.4	5.3	2,795,735	648,438	26,609,313	9.0
	50-199	60.8	7.1	1,288,614	268,463	18,528,022	5.1
	200-399	39.3	6.8	956,948	186,773	11,332,679	8.1
Low Class Bituminous (LCB)	All	30.4	4.6	1,395,079	277,059	10,528,706	11.5
	0-49	-	-	-	-	-	-
	50-199	-	-	-	-	-	-
	200-399	30.4	4.6	1,395,079	277,059	10,528,706	11.5
Total		219.9	6.0	6,436,377	1,380,733	66,998,720	

As demonstrated in the table above, the average road condition per the 2020 Road Needs Study is 6.0/10. These ratings represent a weighted average of the condition of all Township roads (weighted by road length) as of December 31, 2020. The Township will undergo a Road Needs Study every five years, with the results used to update the relevant sections of this Plan.

2.6 Bridges and Culverts

The Township's bridge and culvert inventory consists of three structures. This category encompasses structural culverts, which are defined as any culvert with a span exceeding three metres. The bridge inventory and condition ratings below are based on the 2019 OSIM inspections performed by Tulloch Engineering Inc.

Table 9- Bridge Inventory Summary

Structure	Quantity	Average Condition Rating	Historical Cost	Net Book Value	Estimated Replacement Cost	Average Age/Useful Service Life
Bridges	3	7.5	1,753,739	1,319,081	3,795,000	25.19
Culverts	-	-	-	-	-	-
Total	**3**	**7.5**	**1,753,739**	**1,319,081**	**3,795,000**	**25.19**

A detailed condition assessment of each structure is included in the 2019 *OSIM Bridge and Culvert Inspection Program*. The Township generally relies on the recommendations provided in the OSIM report to establish a rehabilitation work plan. A similar inspection was conducted in 2021, the results for which were not finalized at the time of this Plan's creation.

The results of the biennial structure inspections will be used on an ongoing basis to update the bridge inventory. The next inspection is scheduled to be completed in 2023.

2.7 Buildings

The Township owns five building assets, which are comprised of the municipal offices, a museum, a sand/salt shed, a communications tower, and a storage facility. A summary of the Township's building inventory is provided in Table 10 below.

Table 10 - Buildings Inventory

Building	Condition	Year Built/ Last Improved	Age	Historical Cost	Net Book Value	Estimated Replacement Cost
Municipal Offices	GOOD	2020	1	$362,524	$276,377	$1,167,106
Museum	POOR	1962	59	$3,203	-	$144,900
Communications Tower	POOR	2010	11	$5,847	$4,473	$21,600
Sand Salt Shed	FAIR	1993	28	$165,136	$51,605	$315,000
Shop Ventilation System	GOOD	2016	5	$38,472	$34,144	$41,031
Quonset Hut	POOR	1962	59	$4,982	-	$175,500
Total				**$580,164**	**$366,599**	**$1,865,137**

The condition of the Township's buildings is planned to be reviewed annually by staff to identify the need for repairs/upgrades. Results of the inspections shall be used to update the Plan as part of the regular Plan review process.

2.8 Vehicles

The Township owns a fleet of vehicles generally dedicated to public works, emergency services, and recreation. A summary of the fleet is provided in Table 11 below. Note that, in this version of the Plan, recreation and emergency services vehicles have been included in Section 2.10 *Local Board and Joint Committee Assets* and are not listed in the below table.

Table 11 - Vehicle Inventory

Vehicle Category	Quantity	Condition	% of Service Life Remaining	Historical Cost	Net Book Value	Estimated Replacement Cost
Public Works Vehicles	9	6.2	57%	1,359,174	768,404	1,934,377
Total	**9**	**6.2**	**57%**	**1,359,174**	**768,404**	**1,934,377**

An assessment of each vehicle's condition has been established through a visual inspection of the critical components and working capability. Unless visual inspections indicate otherwise, condition scores are assigned based on the vehicle's total mileage to date. Vehicles shall be evaluated on an annual basis to assess their condition and residual lifespan. Results of the evaluation will be used to update the Plan as part of its ongoing review.

2.9 Machinery and Equipment

The administration and operation of the Township is dependent on an inventory of equipment required for daily administrative, public works, fire, recreation, and other services. A summary of the Township's machinery and equipment inventory is provided in Table 12 below. Note that, in this version of the Plan, recreation and fire equipment have been included in Section 2.10 *Local Board and Joint Committee Assets* and are not listed in the below table.

Table 12 – Machinery and Equipment Inventory

Category	Quantity	Condition	% of Service Life Remaining	Historical Cost	Net Book Value	Estimated Replacement Cost
General Government	3	5.8	53%	$22,447	$11,951	$23,993
Public Works	5	5.6	34%	$124,369	$42,899	$53,163
Winter Operations	1	1.5	0%	$3,332	-	$16,200
Total	**9**	**4.9**	**37%**	**$150,148**	**$54,850**	**$93,356**

At this time, the condition for each item of machinery and equipment has been established using an age-based formula and no formal evaluation has been undertaken. As best practices for assessing the condition of these assets continue to emerge, the condition rating will be updated and monitored as part of the regular Plan review.

2.10 Local Board and Joint Committee Assets

The Township currently offers a number of services by way of cost-sharing agreements with neighbouring municipalities. Although decisions regarding the assets in use by these services are not under the complete control of the Township, the assets are included in all financial reports and a contribution made to the purchase and maintenance expenses at an established cost-sharing percentage. A summary of these assets is provided in Table 13 below.

Table 13 – Local Board and Joint Committee Assets Inventory

Asset Category	Condition	100% Historical Cost	100% Net Book Value	Ryerson Share Historical Cost	Ryerson Share Net Book Value	Weighted Average Lifespan of Assets in Years	Ryerson Share Estimated Replacement Cost
Economic Development	Good	9,435	8,211	3,145	2,737	20	157
Library	Fair	175,987	85,689	32,452	15,801	5	6,660
Fire	Fair	1,071,344	427,673	252,730	100,888	13	21,670
Landfill	Fair	876,660	322,271	277,191	101,899	20	16,623
JBC	Good	43,704	40,968	7,284	6,828	8	911
Arena	Fair	2,363,406	1,149,843	787,802	383,281	37	29,768
Total		**$4,540,535**	**$2,034,655**	**$1,360,604**	**$611,434**		**$75,790**

As of December 2020, the local board and joint committee assets represent 12% of the total historical cost of the Township's capital assets, and 13% of the net book value. The condition of these assets is estimated based on age; however, the largest asset, the shared waste disposal site, is currently estimated to be available for use until 2035.

2.11 Other Assets

The Township of Ryerson owns several miscellaneous assets which are predominantly used by the public and often pose a health and safety liability. For example, poorly maintained docks and boat ramps present a significant risk of critical injury to residents and tourists. These assets have varying lifespans which may be technology dependent.

A summary of the Township's other assets is presented in Table 14 below.

Table 14 – Other Assets Summary

Asset Type	Quantity	Condition	% of Service Life Remaining	Historical Cost	Net Book Value	Estimated Replacement Cost
Land	19	-	-	$245,533	n/a-no replacement	Infinite life
Land Improvements	9	6.6	73%	136,753	99,715	151,015
Computer Hardware and Software	3	-	0%	-	-	-
Total		**6.6**	**73%**	**$382,286**	**$99,715**	**$151,015**

Due to the relatively low value of these other assets to the Township, condition assessments have been estimated using each asset's age. These assets shall be evaluated on an annual basis for signs of impairment that would impact their residual lifespan. Results of the evaluation shall be used to update the Plan as part of the ongoing review.

3.0 Levels of Service

Municipalities exist for the purpose of providing services to their communities. These services are normally discussed in terms of eight functional areas including, for example, General Government, Protection to Persons and Property, and Transportation. However, since this Plan is specifically related to the management of assets, levels of service in this Plan are being defined on the basis of services provided by asset types rather than by services provided by functional areas.

Levels of service are statements describing the degree to which all of the services will be provided. Levels of service can be defined based on any number of asset attributes, such as, how much are we going to provide, what level of safety are we providing, what aesthetic standards will be maintained, what condition will be maintained, etc. O. Reg. 588/17 requires the Township to identify levels of service on both a customer and technical basis.

A customer (i.e., strategic) level of service is essentially a high-level description of the provided service from the perspective of the community. These typically include descriptions of the function and condition of the available assets.

In contrast, a technical level of service is a statement about what actions (programs, procedures and activities) the municipality needs to undertake in order to provide services at the identified customer level. Briefly, the focus is on what the municipality can do as opposed to what the community is going to receive. In order to be measurable and useful, the technical levels of service are often linked to a performance metric that can be tracked and evaluated over time.

The levels of service provided by a municipality should be established according to five main factors: the community's expectations, the community's ability to pay, the strategic goals of the Municipality, legislative requirements (e.g., Minimum Maintenance Standards for Municipal Highways, O. Reg 239/02), and what the Municipality can be reasonably expected to provide with its available staff resources.

Ultimately, it is Council that defines the levels of service, and in so doing, they must balance three key factors: cost, risk, and performance. Typically, an increase in the level of service (performance) will present less risk but at a higher cost. It must also be noted that the attainment of levels of service is critically dependent on staffing levels. Due to the finite number of working hours for existing staff, and difficulty in recruiting and retaining qualified staff in any capacity, an increase in the level of service in one area is generally only possible by decreasing that in another area.

3.1 Customer and Technical Levels of Service

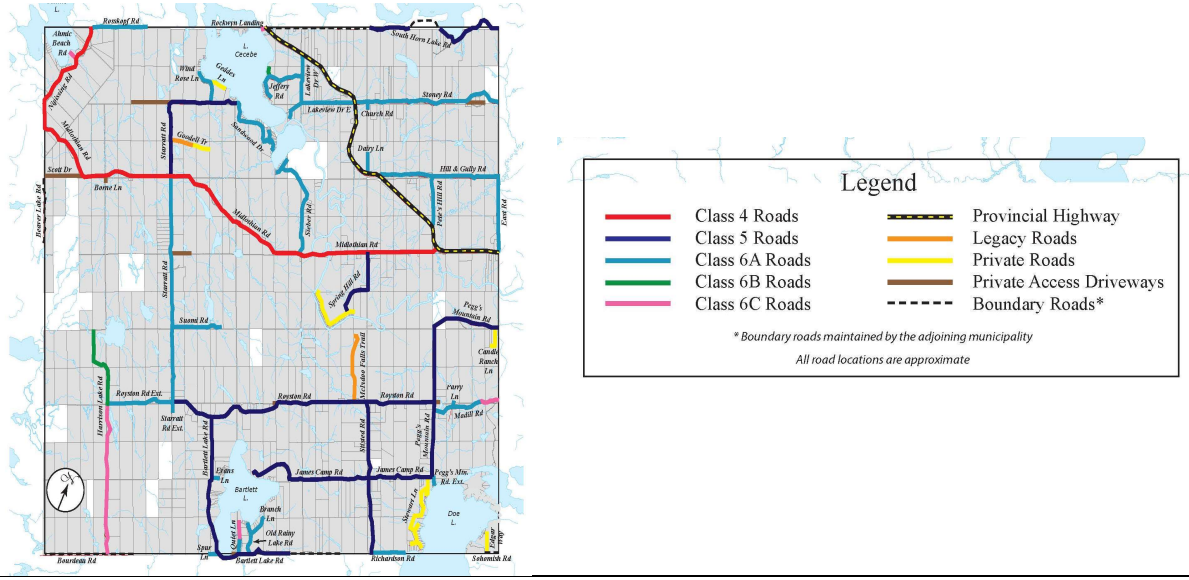
The following sections outline the Township's current levels of service (customer and technical), and related performance indicators for the technical levels of service. Of the infinite number of performance indicators available, those used here have been selected (using the SMART guidelines)[2] as being the most relevant and important to the Municipality. These may evolve in future iterations of the Plan.

These levels of service form the basis of the projected expenditures later in this Plan. The targets established for this Plan were based on the current service levels the Township has been able to achieve with the assistance of senior-level government funding. All levels of service marked with an asterisk have been mandated in O. Reg. 588/17.

[2] SMART guidelines state that key performance indicators should be **S**pecific (clear and unambiguous, outline exactly what is expected, who is responsible/involved and how it is to be measured), **M**easurable (a clear procedure for measuring progress), **A**chievable (a realistic target), **R**elevant (to people trying to achieve the target and/or service being delivered) and **T**imely (realistic time frame to achieve the target).

3.1.1 Roads

Objective: to provide a safe and reliable road network that takes people where they want to go at the lowest possible cost for current and future users.

Description	Customer Level of Service
Description, which may include maps, of the road network and its level of connectivity*	The Township's road network spans a total of 110.0 km, which is comprised of 17.3 km of Class 4 roads, 41.5 km of Class 5 roads, and 51.2 km of Class 6 roads. The provincially maintained Highway 520 runs through the north-east corner of the municipality, and connects Ryerson to the neighbouring Township of Armour and Village of Magnetawan. Midlothian Road runs east-west through the Township, and is the most heavily trafficked roadway along with the adjoining Nipissing Road. The following diagram provides an illustration of the Township's existing road network and is colour-coded by road classification. 

Descriptions or images which illustrate the different levels of road conditions (PCI and gravel)*	Surface Treated Roads:  PCI=100  PCI=60  PCI=20 Gravel Roads:  SAI=90  SAI=60  SAI=10

In general, the Township is not growing at a sufficient rate to warrant the expansion of its road network. Therefore, roads will generally be left as is (i.e. no new roads will be constructed, no currently gravelled roads will be paved, and no currently seasonal roads will be maintained year-round).

Activity	Technical Level of Service	Current Level of Service	Performance Indicator
General	Number of lane-kilometres of each of arterial roads (Class 1 and 2), collector roads (Class 3 and 4), and local roads (Class 5 and 6) as a proportion of square kilometres of land area in the municipality*	Arterial Roads: 0 Collector Roads: 0.18 lane km/km^2 Local Roads: 0.99 lane km/km^2	
	For paved roads, the average pavement condition index value*	4.6 (Fair)	Average condition rating (PCI)
	For unpaved roads, the average surface condition (e.g. excellent, good, fair, poor)*	6.2 (Fair)	Average surface condition
Brushing	Overhanging brush cut back each year to maintain safe sightlines, ensure signage visibility, and maintain a presentable appearance	5 km brushed each year	Kilometres of roads brushed each year
Complaints	Complaints prioritized using a pre-assessment where possible; response time based on level or urgency, location, complexity of task, and safety concerns	Serious complaints responded to within one week of report	Number of serious complaints received
Culverts	Culverts put in place to direct water away from the road; culverts replaced/upgraded based on water levels the previous spring	90m of culverts repaired/ replaced/installed per year	Meters of culverts repaired/ replaced/installed per year
Ditching	Ditching performed based on threat of road washing, so as to control/ remove surface water and prevent erosion or damage	Up to 400m ditched per year	Metres of roads ditched each year

Dust Layer	Dust suppressant applied to consolidate the granular material and control airborne dust particles	Calcium applied once per year to 90% of roads	% of roads receiving calcium application in a year
Grading	The grader and water truck are exclusively devoted to grading during the summer work season. The roads are done cyclically; there is no prioritization based on class, and roads are done on a Township-wide route which takes approximately 4 weeks to complete. Potholes and washboards are graded on an as-needed basis	Each road graded 4 times per year	Man-hours spent grading each year (2020: 784.0)
Ice Events	Three trucks run sanding routes, which are based on the plowing routes. Roads are sanded as required.	All roads sanded within 36 hours of extreme weather event	Tons of winter sand applied to roads in the year (2020: 5,187)
Lanes	All high-traffic roads maintained as two lanes. Roads with an AADT below 50 are generally one-lane.	15.0 km of single-lane roadway	Kilometres of roads that are single-lane only (surface width of 4m or less)
Mowing	All roadsides mowed once per year	232km (both sides of 116km of road) mowed annually	Kilometres of roadside mowed each year
Plowing	Three plow trucks run separate routes and plow a minimum of once per day. Each route takes between 3.5-6 hours to complete.	Roads plowed when snow accumulation reaches 10cm	Man-hours spent plowing each year (2020: 1,157.5)

Road Access	Roads constructed to provide access to properties, allowing for residential construction and other development.	25.7% of original parcels cannot be accessed by road.	Percentage of original 100-acre parcels that cannot be accessed by a public or private road.
Surface Imperfections	All hardtop surfaces checked for potholes and patched.	Roads checked every three weeks	Average condition rating Amount of cold mix applied to roads in the year (2020: 12.1 T)
Surface Treatment Resurfacing	% of roads/km of roads repaired or replaced each year	None (on average)	Kilometres of roads repaired or replaced each year
Gravel Resurfacing	% of roads/km of roads re-gravelled each year; once per year via tender	10km/year	Kilometres of roads re-gravelled each year

3.1.2 Bridges and Culverts

Objective: to provide a safe and reliable bridge and culvert network that takes people where they want to go at the lowest possible cost for current and future users.

Description	Customer Level of Service
Description of the traffic that is supported by the municipal bridges (e.g. heavy transport vehicles, motor vehicles, emergency vehicles, pedestrians, cyclists)*	All bridges in the municipality predominantly support motor vehicles, and are located on roads with an AADT ranging from 200-399. Heavy transport traffic is predominantly a result of work performed by the municipal Public Works staff, with occasional traffic resulting from the local aggregate pits. Emergency vehicles are an infrequent source of traffic on the Township's bridges.
Description or images of the condition of bridges and how this would affect the use of the bridges*	Magnetawan River Bridge (BCI 74.78): This bridge, built in 2004, is overall in good condition. There are some signs of cracking with efflorescence in the abutments, and damage to the barrier walls due to past vehicle collisions. There are no restrictions on the use of the bridge at the present time. Midlothian Road Bridge (BCI 99.43): This bridge was replaced in 2017 and is in excellent condition overall. There are some signs of damage to the guiderails, and the retaining walls are in need of additional rip rap material. There are no restrictions on the use of this bridge at the present time. Nipissing Road Bridge (BCI 56.27): Nearing the end of its service life, the Nipissing Road Bridge is overall in poor condition and is showing signs of structural distress. Although the deck is overall in good condition, there are medium cracks at various locations and signs of erosion along the embankments and abutment walls. Although the bridge was not load-restricted as a result of the 2019 OSIM inspections, there may be a need for such restrictions to be imposed in the near future.

Activity	Technical Level of Service	Current Level of Service	Performance Indicator
General	Bridges suitable for all traffic, meaning they do not have any loading or dimensional restrictions*	No loading or dimensional restrictions	Percentage of the bridges in the municipality with loading or dimensional restrictions
	For bridges, the average bridge condition index value*	75.33	
Inspections	Perform bi-annual OSIM inspections	Inspections done bi-annually to 100% of bridges	Percentage of bridges inspected by an approved engineer
Deck Sweeping	All bridge decks swept once per year	Performed once per year to 100% of bridges	Percentage of bridge decks swept in the year
Repairs	Repairs completed as required, based on the OSIM reports. Target is to address short-term issues by the next bridge inspection	Issues generally not addressed (0%)	% of immediate issues identified in the report that have been addressed (as a percentage of the dollar value)

3.1.3 Buildings

Objective: to have facilities suitable for their intended use that provide for a safe user environment at the lowest possible cost for current and future taxpayers.

Description	Customer Level of Service
Description, which may include images, of the municipal buildings by function	The Township office is a roughly 6000 square foot building that is used by the administration and public works staff. It houses the Council chambers, four vehicle bays, and is used as the main community centre for the general population. Adjoining the municipal office is a sand and salt shed. This 5,504 square foot wood-frame structure shelters approximately two-thirds of the annual winter sand supply from the elements, ensuring the product can be safely and easily applied to the roads. The Township also owns a 2,520 square-foot steel storage facility colloquially known as the Quonset Hut. Although this was historically used as an equipment depot, in recent years it has been used to store excess supplies and machinery no longer in use by the fire department and public works staff. One of two main historical attractions in the region is the Watts School House. Although the exact date of construction is unknown, it is believed to have been built around the year 1900. Today, it serves as a museum and historical site and is open to the public on weekends during the summer months. Three changehouses can be found near to lakes in the municipality. These 72 square foot wood structures were built in the 1970s, and are generally in poor condition. Finally, the municipality owns a storage shed at the base of a communications tower. This small, 64 square foot structure was built in 2010. As of 2018, electricity is no longer being supplied to the building.

Description of the condition of the buildings, and their suitability for intended use	The Township office has recently undergone substantial interior renovations and a roof replacement. Aside from the building shell and foundation, the remainder of the building components have been replaced within the past two years and is overall in good condition. There is generally sufficient space for the municipal staff, however the Council chamber is cramped and there is insufficient room for large public gatherings. The sand/salt shed is structurally sound, and few repairs are required. It does not have sufficient space to store a full year's purchase of winter sand, and therefore a pile outside must be maintained. The Quonset Hut has undergone few repairs over the past few years and the building is generally in poor condition. However, as this is essentially an overflow equipment storage site, the building remains adequate for its intended use. The School House is also generally in poor condition. Repairs are required to the siding, doors, and windows, and the building would benefit from updates to the lighting and insulation. Any repairs must balance the need to maintain the historic character of the building. The Township does not generally allocate much budget funding to this building each year, and therefore external grants must be sought to allow for the needed renovations to occur. Despite its condition, the School House is adequate for its use as a local historical site. Finally, the changehouses have not generally been maintained and are also in poor condition. It is difficult to determine suitability as data regarding their frequency of use is not available.

Activity	Technical Level of Service	Current Level of Service	Performance Indicator
General	Square feet of buildings by function	Administration- 1,500 Public Works- 4,500 Storage- 8,408	Square feet of buildings by function

		Recreation- 816	
Condition	Overall condition index (good/fair/poor)	Overall: 6.6 (Good) 50% of facilities rated poor	% of facilities whose condition is rated poor or worse
Inspection	Facilities inspected annually to determine where upgrades or repairs are required	Currently no formal inspections done (0%)	Percentage of facilities that have been inspected in the previous year
Cleaning	Facilities cleaned once per week	Township office and fire hall cleaned once per week; museum cleaned bi-weekly; no other facilities cleaned	Total amount spent on cleaning services per year (2020: $3,498)
Suitability	Ability to store all trucks indoors Capacity to store winter sand and salt in the sand shed Square feet of office space, including storage space, per employee	All trucks can be stored indoors Winter sand/ salt does not fit in shed Admin space- 375 Roads space- 900	Square feet of office space, including storage space, per employee

3.1.4 Vehicles

Objective: to have safe and reliable vehicles to facilitate the provision of municipal services at the lowest possible cost for current and future taxpayers.

Description	Customer Level of Service
Description of vehicles and their intended use	The Township owns three dump trucks; a 2005 Volvo, 2007 Freightliner, and 2013 Western Star. These are used during the summer for hauling materials to various job sites, and continuously during the winter as snow plows. The 2005 and 2007 vehicles are both scheduled for replacement within the next five years. Two pickup trucks are also in the fleet; a 2009 GMC half-ton and a 2019 Ford three-quarter ton. These trucks are used to transport personnel and small materials to job sites, as well as for road patrols, inspections, and large vehicle refueling. The GMC is nearing the end of its useful life, and it is not anticipated to be replaced upon disposition. In 2019, the Township purchased a backhoe as a replacement for its existing, aged JCB. This is a multipurpose frontline machine that performs various road maintenance tasks, including snowplowing, changing culverts, and ditching. It can also be used in emergency situations to clear obstructions from municipal roadways. The Township also owns a Volvo EW160E excavator. Purchased in 2016, this equipment is user for larger jobs such as excavating road beds, ditching, and loading/unloading materials. In addition, this equipment can be used for brushing municipal roadsides when its mulcher head is installed. One of the frontline pieces of equipment is a John Deere 770 grader. This runs continuously during the summer months to smooth and pack the gravel roads, and is also used infrequently during the winter for ice blading. The grader was purchased in 2014, and is slated for replacement in 2034.

	The final item of equipment is a Volvo loader, also purchased in 2014. This is predominantly used for loading materials into dump trucks for road maintenance and construction. It is also used on occasion for clearing snow, ditching, and clearing obstructions in emergency situations.

Activity	**Technical Level of Service**	**Current Level of Service**	**Performance Indicator**
General	Number of vehicles by functional area	Public works- 9	
	Overall fleet condition index, or percentage of fleet where the condition is rated poor	Overall: 6.2 (Fair) 22% rated poor	Percentage of fleet where the condition is rated poor or lower
Downtime	Lost service capacity from out-of-operation vehicles (# of days/280 that the vehicle is available for use)	5.6% downtime High: 21% (#07)	Average downtime as a percentage of total annual hours
Maintenance	All regularly scheduled maintenance is performed in accordance with the vehicle manual, at a minimum. Vehicles are to be maintained in a clean condition and washed on a regular basis to remove dirt and/or road salt.	Regularly scheduled maintenance performed as per vehicle's schedule. Annual inspections for plow trucks.	

3.1.5 Machinery and Equipment

Objective: to have safe and reliable equipment to facilitate the provision of municipal services at the lowest possible cost for current and future taxpayers.

Customer Level of Service	Description
Description of the types of equipment and their intended use	In 2015, the Township purchased a Konica photocopier which is used daily for printing, scanning, and faxing duties in the administrative office. The copier is serviced annually and is generally in fair condition. The Township owns a propane-operated backup generator at the municipal office and garage, which is used to provide power to certain outlets in the case of an extended power outage. It is automatically tested each week and is serviced annually, was purchased in 2016, and is overall in fair condition. Another core piece of equipment is the Grandstream UCM6104 phone system, which was purchased in 2017. This is a two-line phone system with call forwarding, parking, conference calling, and recording capabilities. The system was re-vamped in 2020 to add a call-in menu to reach specific Township employees, and is overall in good condition. Public Works equipment includes a packer, fuel tanks, and plow and wing for the 2005 Volvo tandem plow. All of this equipment is in fair condition. Finally, the Township owns a culvert steamer which was purchased in 1981, which is used to unfreeze driveway and other small culverts in the springtime. The steamer generally remains in usable condition, but is very old and a rental unit is sometimes procured for more substantial jobs.

Activity	Technical Level of Service	Current Level of Service	Performance Indicator
General	Number of equipment assets by functional area	General Govt- 3 Public works- 5 Winter Ops- 1	
	Certain pieces of equipment rented where the frequency of use does not warrant a purchase	Sweeper, packer, grade-all, bulldozer, track excavator rented	Total spent on equipment rentals in the year (2020: $1,191)
	Overall equipment condition index, or percentage of equipment where the condition is rated poor	Overall: 4.9 (Fair) 22% rated Poor	Percentage of equipment where the condition is rated poor or lower
Maintenance	All regularly scheduled maintenance is performed. Other repairs made as required.	Generator and copier maintained annually. Others repaired as needed.	Number of service calls (2020: 7)

3.1.6 Land Improvements

Objective: to have safe and functional boat ramps, docks, and other land improvements with the appropriate quality and quantity of amenities at the lowest possible cost for current and future taxpayers.

Customer Level of Service	Description
Description of the land improvements in the Township	Two land improvements can be found at the Township office. First, the office is marked by a large sign and flower bed that is maintained throughout the summer. These were constructed in 2014, and are in good condition. The Township is also in the process of constructing a storage facility on the office property, which is designed to be used for storing winter sand, RAP, and other small public works materials. Construction began in 2018, and remains in progress through the end of 2020. One of the Township's three cemeteries is gated and surrounded by steel post fencing. This was built in 2014 and remains in good condition. The Township also provides amenities at two water bodies. A boat ramp was constructed on Bartlett Lake in 2010 and is in fair condition. As well, the Township, in conjunction with the neighbouring Municipality of Magnetwan, owns a steel dock on Lake Cecebe known as Rockwynn Docks. This was originally constructed in 1998, but has been renovated continuously and is in fair condition overall.

Activity	Technical Level of Service	Current Level of Service	Performance Indicator
General	Number of water bodies with municipal amenities	Two (Lake Cecebe and Bartlett Lake)	
	Land improvements maintained in good condition	Four (67%)	Percentage of land improvements in good condition or better.
Inspections	Amenities inspected once per year, or more frequently as required	Not currently inspected (0%)	Percentage of land improvements inspected in the year

3.2 Current Cost to Maintain Levels of Service

The levels of service described above are undertaken by the following Municipal employees:

- General government—3 full-time and 1 part-time employees
- Protection services—1 part-time employee
- Transportation services—5 full-time employees
- Parks and recreation—1 independent contractor

Typically, these employees wear many hats, but all of them have at least some level of involvement in the operation, maintenance and management of capital assets. For some (i.e., transportation staff), asset-related activities are a significant part of their day-to-day responsibilities.

The costs of providing the current levels of service are included in Appendix A in the "Actual" columns. These do not include labour costs unless there is a specific change in staffing required. Therefore, to get a complete picture of the cost of providing these levels of service, the total salaries of the employees whose primary role is asset-related could be added to the costs included in Appendix A. At present, the total annual cost of the relevant employees is $412,952 and their average cost per hour worked is $39.26.

In Appendix A, costs to maintain the current levels of service are shown under the general categories of "Non-infrastructure solutions", "Operating costs", "Maintenance activities", "Renewal/Rehabilitation activities", "Expansion activities", and "Debt principal and interest repayments". No disposal costs have been identified (if any such costs were actually incurred, they have been included in one of the other categories). In the most recent completed fiscal years, the total, combined expenditures were $1,031,158 in 2019, $1,163,390 in 2020, and budgeted to be $1,635,626 for 2021. Additional detail of some of the components of these expenditures is provided below. A complete breakdown of operating expenditures by category can be found in Appendix C.

Asset Category	2019 Actual	2020 Actual	2021 Budget
Non-Infrastructure	41,577	50,103	48,845
Roads	291,156	268,825	511,466
Bridges and Culverts	7,300	12,663	20,000
Buildings	40,824	358,767	193,950
Vehicles	316,820	140,873	472,900
Equipment	6,104	4,599	6,300
Other Assets	30,702	51,332	40,677
Shared Services	296,675	276,228	341,488
Total Expenditures	**1,031,158**	**1,163,390**	**1,635,626**

3.3 Issues and External Trends Affecting Levels of Service

There are a variety of internal and external factors which may impact the Township's ability to meet its target levels of service as well as the evolution of its service targets. The following is a summary of the more significant external trends and factors which could impact the provision of sustainable services to the public.

Fiscal Capacity: Significant financial investment is required to maintain municipal infrastructure and provide desired levels of service. Municipalities typically have limited means for raising adequate and sustainable funding to meet both operational and capital requirements, and as a result are heavily reliant on senior-level government funding. The Province has indicated an intention to download additional costs to municipal governments, which will further stretch limited funding and make it more difficult to finance capital expenditures at target levels.

Pit Development: The controversial potential opening of an aggregate pit within the Township of Ryerson could put pressure on the Township's road and bridge infrastructure, requiring additional investment to support its development. Should this initiative progress, the Township will need to explore cost-sharing initiatives to ensure the long-term sustainability of all impacted infrastructure.

Accessibility Standards: Existing and future requirements with respect to accessibility standards may necessitate upgrades to buildings and facilities which are not currently anticipated under the Plan.

Limited Population Growth: Population growth and other demographic changes serve as a significant demand driver for current and future assets. Limited growth in the development and population of the Township is anticipated, which makes it difficult to raise the tax dollars necessary to fund infrastructure spending at an optimal level.

Recreational Development: Increased demand and related assessment value for waterfront property within the Township could have a positive influence on the municipality's assessment base. However, any increase in the population base comes with heightened demands for recreational and other infrastructure.

Weather Events and Climate Change: Broad environmental and weather patterns have a direct impact on the reliability of critical infrastructure assets. Although the future impact of climate change is uncertain, it is widely believed that climate change will lead to more extreme weather events. As such, the impact of weather events on municipal infrastructure will need to be considered in defining the levels of service.

The impact of weather events on infrastructure varies with location and topography. Examples of specific impacts on Township assets include the washout of gravel roads due to intense rainstorms, damage to roads and bridges from meltwater flooding, and a decrease in machinery lifespans resulting from increased usage.

Community Expectations: There is a recent trend towards heightened standards for health, safety, and environmental protection. Although the general public often has an opinion on how public services should be delivered, there is a disconnect between the level of service expected from the community and what it is willing to pay for. Increased resources for monitoring and managing these expectations are required to ensure the right balance of service level, cost, and risk is maintained.

Organizational Change and Capacity: Formal asset management is a labour-intensive process, and requires a significant depth and breadth of knowledge across the organization. The amount of staff time required for this task is expected to increase over time, as new reporting requirements under O. Reg. 588/17 take effect.

Since formal asset management planning was mandated by the Province, the Township has not increased its staff complement. It will likely become increasingly difficult to manage the workload at current staffing levels.

In addition, most of the Township's senior staff are approaching retirement. The loss of knowledge and experience that will accompany their departure could have a significant impact on the Township's ability to provide services to the community at the levels previously experienced.

4.0 Asset Management Strategy

The purpose of the asset management strategy is to establish a set of planned actions that will enable the Township's assets to provide the desired levels of service in a sustainable manner, while managing risk, at the lowest possible cost to municipal taxpayers. Consequently, establishing a strategy involves considering the different actions over the lifecycle of the assets that would allow them to provide the needed level of service, and the potential risks and costs associated with each option, as a means to extract the maximum possible value from each asset.

Acquiring assets and simply letting them deteriorate until they are no longer useable is a strategy commonly followed by small municipalities. Conventional wisdom suggests, however, that within most asset classes there are key times during the lifecycle that smaller maintenance or rehabilitation investments can increase the asset's lifespan, thereby delaying the need for replacement and lowering the overall cost of ownership. It is generally accepted that doing reactive replacement of assets in the worst condition, the approach often followed by municipalities in the past, has the highest lifecycle cost of all available options.

Many industry studies have been conducted around this theme, particularly in relation to roads and bridges. One such analysis is presented in **Appendix E**. In this lifecycle analysis, it is demonstrated that a pavement management approach of strategic preventative maintenance and rehabilitation is approximately 23% cheaper than one of performing no preventative maintenance and simply replacing the asset at the end of its useful life. The appendix also provides an example of a strategic bridge maintenance program, which is approximately 50% cheaper than a strategy of no maintenance.

In another published study, using industry standard activities and costs, the costs for various road activities per year of added life was calculated. These are presented in the **Table 15**. This study supports the analysis presented in the **Appendix E**, and shows that if applied at the right time in an asset's life, maintenance and rehabilitation activities have a lower cost per year of life added than reconstruction does.

Table 15 – Cost Per Year of Added Life

Treatment	Cost per m^2	Additional Years of Life	Condition Range	Cost per Year of Added Life
Paved Road – Reconstruction	$140	35	25-0	$4
Paved Road – Resurface	$50	18	50-26	$2.77
Paved Road – Crack Sealing	$2.50	4	75	$0.63
Surface Treatment – Reconstruction	$130	25-30	25-0	$4.40
Surface Treatment – Resurface	$50	15-18	50-26	$3.33
Surface Treatment – Crack Sealing	$2.00	4	75	$0.50

In yet another analysis, it was determined that timely maintenance and rehabilitation activities could extend the useful life of road assets as follows:

- Paved Roads – increase lifespan from 25 years to 58 years;
- Surface Treated Roads – increase lifespan from 20 years to 33 years;
- Gravel Roads – increase lifespan from 10 years to 16 years.

The above examples are three of many studies that illustrate the potential benefits of abandoning the historical strategy of "fix it once it's broken" to a strategy of "fix it before it breaks" (hereinafter referred to as the "preservation management approach"). Ideally, over time, as additional asset and financial data becomes available, the Township will be able to conduct such analyses on its own assets. However, at present the Township does not have the internal resources to do this, and has instead accepted the general applicability of these best management practices to its own assets.

The full application of the preservation management approach outlined below is not feasible in the short-term. Under this approach, staff time must be diverted away from their traditional duties towards monitoring the condition of the assets and preventative maintenance activities. Additionally, with an aged infrastructure and many assets in a condition beyond the point where preservation management techniques may be of benefit, the amount of funds required to address the most significantly deteriorated assets would leave little to no resources for maintaining assets currently in good condition.

Consequently, it is the Township's intention to gradually move towards this approach by applying the best management practices outlined below to new/recently rehabilitated assets when financially feasible. This will require the cooperation of Council and staff; Council must allocate sufficient resources to implement best management practices, and staff must recommend and employ best management practices.

In addition to moving towards the preservation management approach, the Township will immediately incorporate the following generic strategies in their capital planning:

- non-essential capital projects will not be undertaken at the expense of preservation management activities;
- in lieu of delaying projects or purchasing specialized equipment, use of external contracted services will be considered;
- additional assets will not be constructed/acquired without considering the impact such expenditures may have on future operations and expenditures;
- the possibility of renting/leasing an asset (e.g., buildings or equipment) or jointly purchasing assets with neighboring municipalities will be considered prior to acquiring/constructing a new asset;
- as a means to control demand for increased levels of service, local improvement charges will be considered when increases in service level will benefit a specific group of taxpayers;
- the Township will be prepared to capitalize on senior government funding opportunities as they arise.

4.1 Condition Assessment Programs

The preservation management approach focuses on consistently taking the right actions at the optimal time throughout the entire lifecycle of an asset, rather than waiting for the asset to disintegrate before intervening. Since the effective application of a preservation management approach involves actually knowing/being able to predict what the condition of your assets is, a necessary component of the strategy is to establish condition assessment protocols. As part of the Township's strategy, the following condition assessment approaches are planned:

Roads - A road needs study, prepared by a professional engineer, will be completed every five years. These studies typically include a schedule of priority road projects, based on a "worst first" approach. In addition to this, the consulting engineer will be requested to provide recommendations for appropriate road treatments based on industry best practices. A 10-year plan for road expenditures should be developed as part of the engagement, and will form the basis for the Township's planned expenditures. Municipal staff should review the per-unit cost estimates with the engineer contracted to prepare the study, to ensure reasonable local-area rates are incorporated. Prior to inclusion in subsequent annual budgets, proposed roads are to be reviewed in the field to ensure the suggestions of the roads needs studies reflect the actual condition of the road assets.

Bridges and Culverts – Ontario municipalities are mandated to inspect all bridges and culverts over 3 metres in span according to the Ontario Structure Inspection Manual (OSIM). An OSIM inspection on all qualifying bridges and culverts will be conducted every two years by a qualified engineer, as required by the Ministry of Transportation. Items noted in the inspections will be incorporated into subsequent annual budgets. The consulting engineer will be requested to provide a ten-year work schedule, incorporating cost-effective preventative maintenance and rehabilitation work as appropriate, in addition to recommending if supplementary studies on particular bridges are required. Recommendations in the OSIM reports will form the basis of planned capital expenditures.

Buildings – A building assessment checklist has been developed for use by the managers of public works, parks and recreation, and fire department for performing annual inspections of the buildings for which they are responsible. A rating system has been established that evaluates the condition of the components of the building and of the building overall. From there, it can be determined which planned actions should be taken as part of the asset management strategy.

The Township is not contemplating formal building assessments performed by a trained industry professional (typically architects or engineers) at the present time. In such assessments, various components of the building (site components, structural components, electrical components, mechanical components, vertical movement) are inspected, and a facility condition index (FCI) is calculated. The FCI is an industry standard numerical summary of a building's condition, which measures the value of required improvements as a percentage of the total building value. In the future, the

Township may consider having a formal inspection completed before any major refurbishment or rehabilitation is performed on a building.

Vehicles and Machinery– Vehicles and machinery undergo routine inspections as required by legislation and operational needs, the frequency and nature of which depend on the use of the asset. Vehicles and machinery are serviced both in-house and externally depending on the level of technical ability required. A more proactive preventative maintenance program is not currently being considered.

Other Assets - the other asset inventory is comprised of many different types of assets, each of which requires a specific inspection system which is determined by examining the risks of damage to property, inconvenience, or injury to the public associated with them. Critical assets, being those which are of high value and/or pose a significant risk, will be subject to greater scrutiny than those with lower risks or value. At a minimum, routine visual inspections are to be carried out by staff while performing daily tasks to ensure there are no obvious hazards, and reactive inspections will occur in response to a complaint/request from the general public.

4.2 Risk Assessment

When establishing levels of service, when designing strategies to meet those levels of service, and when distributing available funding over competing projects, the risks associated with various courses of action must be considered. Risk can be viewed as a function of the following:

(a) the probability of an event occurring; and

(b) the consequence of an event occurring (the effect of changing the level of service, having an asset fail, or of not completing a project).

As part of the preparation of its strategy, the Township has researched quantitative risk models developed and employed by other municipalities. Typically, in these models, numerical values are assigned to both the probability and consequence of failure for each asset, theoretically allowing for an objective assessment of its associated risk.

In reality, the Township has seen very little evidence of the effective or consistent use of such quantitative risk models. Further, the process for determining and weighting the numerical values remains highly subjective. Consequently, the Township has decided not to employ any such models in the risk assessment plan, and instead will employ a qualitative method of assessing the risk of various asset management options in accordance with ISO Risk Management standards.

In its simplest form, the probability of failure can be determined by considering how frequently an event has occurred in the past or is projected to occur in the future. It is worth noting that, in this context, "failure" refers not to a complete loss of utility, but to

any inability for the asset to perform its normal function. The following table can be used to assign a "probability" score to each asset:

Table 16: Probability Ratings

Grade	Value	Probability Rating	Frequency Descriptor
A	Virtually Certain	>80%	Will or has occurred multiple times in a single year, over a multi-year period
B	Probable	50-80%	Will or has occurred once per year on average
C	Possible	20-50%	Occurs around once every five years, on average
D	Unlikely	5-20%	May occur within the next 20 years
E	Rare	<5%	Unlikely to occur within the next 20 years

Further, the consequence of failure can be considered as a function of five impact areas: health and safety, community, legal, financial, and environmental. Each of these areas have been incorporated into the following table:

Table 17: Consequence of Failure Matrix

	Value	Health and Safety	Community Impact	Legal Liability	Financial Impact	Environmental Impact
A	Catastrophic	Threat of death, both of staff and the public	Immediate and prolonged impact to the community. Reaction is substantial and requires a significant outlay of resources to rectify.	Township faces a serious and credible threat of multiple lawsuits arising, which may exceed the available insurance coverage. Additional threat of class-action suits.	Budgetary impact above $250,000 (total annual capital budget). All other projects postponed; debt financing required.	Significant impact to natural environment which requires a large outlay of resources to rectify; multiple years to restore; MNR notified
B	Major	Prolonged hospitalization and permanent injuries; not life-threatening	Community concern is raised quickly and to a high level. Some resources are required to resolve issues.	Township faces a serious and credible threat of multiple lawsuits arising, which may exceed the available insurance coverage. Future	Budgetary impact from $150-250,000; debt financing required; some projects postponed	Impact to natural environment requiring at most one year to rectify

				insurability questionable.		
C	Moderate	Hospitalization for a single day at most. Injuries present, but not life-altering	Community raises concerns, however these can be dealt with internally without escalating to a higher level.	Township faces a threat of one or more lawsuits, however the total damages are expected to be within insurance limits. Some concern to future insurability.	Budget impact from $50-150,000; debt not required, some capital projects postponed	Some impact to the natural environment requiring up to six months to rectify
D	Minor	Minor injuries occur; visit to hospital not required	Issues are noted by the public, but are not brought forward for action	Township faces a threat of one or more lawsuits, however the total damages are expected to be within insurance limits. No threat to future insurability.	Budget impact from $10-50,000; may be managed with existing surplus, no debt required	Minor damages to the environment which require at most one month to restore
E	Insignificant	No injuries	Little or no recognition of the issue by the public	Little or no potential for lawsuits or damage to insurability.	Budget impact less than $10,000	No negative impact to natural ecosystems

Once both probability and consequence factors are assigned, these two matrices culminate in the assignment of a risk level to the asset that can be used to help prioritize projects under limited financial capacity.

Table 18- Matrix

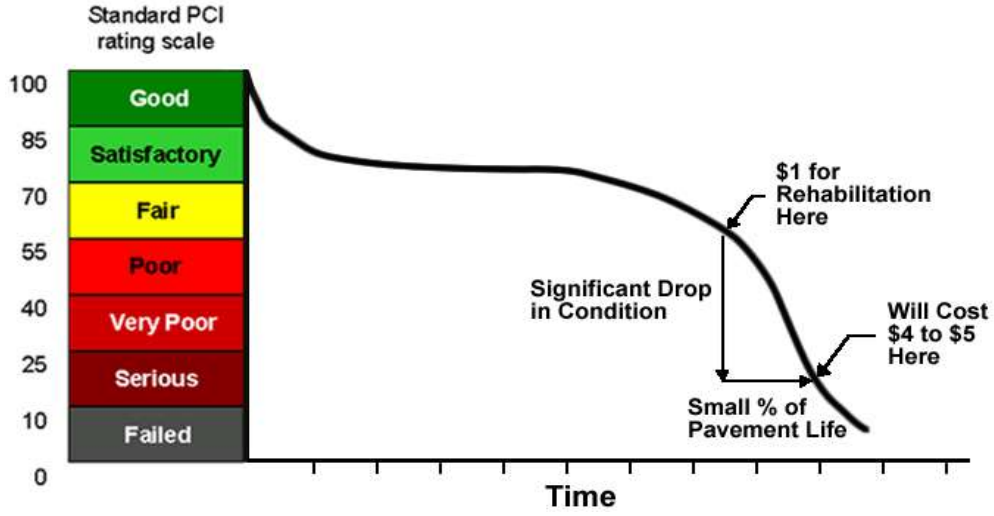
Likelihood	Consequence				
	E Insignificant	D Minor	C Moderate	B Major	A Catastrophic
A- Certain	Medium	Medium	High	High	Extreme
B- Probable	Medium	Medium	Medium	High	Extreme
C- Possible	Low	Medium	Medium	High	High
D- Unlikely	Low	Low	Medium	Medium	High
E- Rare	Low	Low	Medium	Medium	Medium

4.3 Asset Management Strategy Roads – Best Practices Framework

4.3.1 Roads Best Management Practices

As discussed in the introduction to this section, extensive industry research has proven that the key to managing a road network is the timing of maintenance and rehabilitation activities. This idea evolves from the fact that deterioration of a road over its lifespan is generally non-linear. A road generally provides a constant, acceptable condition for the first part of its service life and then, as defects occur, begins to deteriorate very rapidly. If the proper work is not completed during this deterioration phase, surface defects and road drainage can be affected to the point that base failure results and reconstruction of the road is the only available option. **Figure 4.3.1** illustrates the underlying principle in support of a preservation management approach to pavement infrastructure. The principle also has application to each of the classes of roads maintained by the Township. Significant cost savings will result from proactive intervention rather than simply waiting as long as possible before performing maintenance.

Figure 4.3.1 - Typical Service Life of an Asphalt Pavement



Over a road's lifecycle, depending on the condition of the road and the nature of the defect, there are number of different maintenance, rehabilitation and replacement activities that are recommended to minimize the cost of keeping the road in acceptable condition. These can generally be categorized as: preventative maintenance; rehabilitation; replacement/reconstruction. The thresholds for when work activities should be applied coincide approximately with the condition of the assets as shown below:

- Very Good Condition (condition rating 76-100) – preventative maintenance phase: apply relatively low-cost preventative maintenance activities such as crack sealing on paved and surface treated roads
- Fair (condition rating 50-75) – rehabilitation phase: resurface options such as mill & pave, asphalt overly, single and double surface treatments
- Poor (condition rating less than 50 for roads that exhibit defects attributable to the failure of the base soil layers beneath the surface) – reconstruction phase

Preservation management treatments for each type of road are discussed further below.

4.3.2 Preservation Management Approach for Roads

The Township intends to rely on recommendations in its Road Needs Studies to implement the preservation management strategy for the management of its roads. Each of the preservation management activities for gravel, paved, and surface treated roads identified below are guidelines only. Road deterioration rates and the nature of the deterioration will dictate when actions should be taken and what kind of treatment is most appropriate. The treatments outlined below should be considered in any future updates of the Road Needs Study and recommendations on the specific treatments required should be documented and prioritized by the consulting engineer.

A. Gravel Roads

Gravel roads require frequent maintenance, as wheel motion forces material to the outside as well as in-between travelled lanes, leading to rutting, reduced water run-off, and eventually severe road deterioration. If interrupted early enough, this deterioration process can be prevented; simple regrading and compaction is sufficient, with material being pushed back into the proper profile. In addition to this, lifecycle activities including gravel spot and section replacement, dust abatement, ditch clearing, and roadside brushing can help extend the lifespan of a road. Through these perpetual maintenance activities, full reconstruction of gravel roads can be avoided.

A preservation management approach for this class of road, presented as a guideline only, is outlined in the following tables.

Table 19 – Preservation Management Approach - Gravel Surface

Action	Frequency
Regrade surfaces to maintain smooth/safe driving surface and proper crossfall	As needed. Generally 2-3 times per year for higher volume roads; 1-2 for lower volume roads
Add calcium to tighten surface, retain aggregate and reduce dust	Each spring on all roads or higher volume and as needed during summer months. OGRA recommends 4t per kilometer
Ditch and brush rights-of-way to improve roadbed drainage and safety	Complete road network every 10 years

Table 20 - Capital Activities – Gravel Roads

Action	Frequency
Add layer (75mm) of granular material to road surface	Every 3 years for class 4 and 5 roads; every 5 years for class 6 roads
Base and sub-base improvements	As needed or as dictated by traffic volumes
Reconstruct/convert to hard top	As dictated by traffic volumes

B. Surface Treated Roads

A guideline preservation management strategy for surface treated roads is presented in the following table.

Table 21 – Preservation Management Approach – Surface Treated Roads

Activity	Age (Years)	Condition Rating	Service Life Extension (years)
Slurry seal	3	8	4
Slurry seal	6	7	3
Double surface treatment	10	6	5
Pulverize and DST	14	<4	8

In addition to the above-noted preservation approach, the following best management practices should be employed to preserve the surface, extend the service life, and reduce lifecycle costs of surface treated roads:

1. Surface treatment should be applied to the entire road platform, from "grass to grass", including any shoulders. This will eliminate grading on surface treated roads, which has a tendency to damage the edge of the surface treatment and cause premature failure of the surface.

2. New technologies should be utilized where they can be demonstrated to reduce lifecycle costs, such as fibre-reinforced surface treatment. This technology can be used to mitigate reflective cracking when a single or double surface treatment is applied over an aging surface. It can eliminate the need for pulverizing the underlying surface in certain situations and can reduce overall costs.

3. Drainage and culvert needs should be assessed prior to any significant renewal or rehabilitation strategy and any improvements should be completed concurrently. This will eliminate the need to cut/excavate a relatively new surface to replace a culvert.

4. Ditching and clearing (brushing) of the rights-of-way should take place to improve roadbed drainage and safety.

C. Asphalt Roads

Asphalt surfaces are the smoothest, most durable, and most expensive road surface that could be used by the Township. Asphalt provides a constant, acceptable condition for the initial portion of its service life but then begins to deteriorate rapidly as it ages. Surface defects such as cracking and raveling are the first signs of deterioration. If left untreated, the pavement will rapidly deteriorate to the point where reconstruction is the only option. A preservation management strategy can mitigate this by applying renewal treatments earlier in the pavement's life before the conditions deteriorate too far to be effective. **Table 22** below summarizes preservation management activities to be considered for asphalt roads:

Table 22- Rural Asphalt Roads

Activity	Age (Years)	Condition Rating	Service Life Extension (years)
Crack seal	2-6	9	2
Slurry seal/ Microsurface*	4-8	8	4-6
Overlay	12-15	6-7	10
Pulverize and Pave	20-25	<5	20
Reconstruct	30	<4	30

*Slurry seal can be used on lower volume paved roads (less than 1000 vehicles per day). For roads with volumes in excess of 1000 vehicles per day, microsurfacing should be used.

In addition to the above noted preservation approach, the following best management practices should be considered to extend the service life and reduce the lifecycle cost of asphalt roads:

1. Review the condition of other infrastructure, particularly underground infrastructure, prior to implementing any major renewal or rehabilitation of the pavement. Any repairs or capital upgrades to other infrastructure should be coordinated (refer to Section 4.7 for discussion on Integrated Capital Planning). This should reduce utility cuts in newer asphalt.
2. Repair potholes in the surface in a timely fashion to prevent saturation and weakening of road base.
3. Undertake regular shouldering program of rural paved roads to promote proper drainage. Poorly maintained shoulders allow surface water to pond and saturate the road base, which weakens the base and leads to cracking at the edge of pavements.
4. Undertake a ditching program to ensure there is adequate drainage for road base on rural roads. This will reduce the likelihood of structural distresses caused by softening of the road base due to poor drainage.
5. Specify the appropriate type of performance graded asphalt cement for the location.
6. Undertake a clearing program to reduce shading of the roadbed and remove roots/vegetation from the road base.

A high-level approach to establishing an appropriate road budget based on implementing best management practices for gravel, surface treated and paved roads is presented in **Appendix D**.

4.4 Asset Management Strategy Bridges and Culverts – Best Practices Framework

4.4.1 Bridges and Culverts Best Management Practices

As with roads, the structural integrity of bridges and culverts do not fall constantly over time. A new bridge or culvert generally provides a constant, acceptable level of service and condition for the first part of its service life and then begins to deteriorate more rapidly as time progresses. Studies have shown that it is more cost effective to apply more frequent, less costly maintenance and rehabilitation treatments to structures rather than waiting for serious signs of structural failure to become noticeable.

4.4.2 Preservation Management Approach for Bridges and Culverts

The Township intends to rely on recommendations provided in biennial OSIM inspections to implement a preservation management strategy for managing its bridge assets (including culverts larger than 3 m). Each of the preservation management activities identified below should be considered as part of the biennial structure inspections. Deterioration rates and the type of deterioration will dictate when action should be taken and what kind of treatment is most appropriate. Recommendations on the specific treatments required should be documented and prioritized in the OSIM Inspection. A 10-year plan for bridge expenditures should be developed as part of the engagement.

A. Bridge Management Strategy

Bridges are complex structures that generally transmit live loads directly though their structure to a foundation, and are made up of several elements including the foundation, the substructure (abutments or ballast walls), and the superstructure (deck). Bridges are designed with a 75-year service life, but to achieve this life span, intervention at periodic times is required. Through rehabilitation, it is also possible to extend this lifespan to approximately 100 years, delaying the need for costly replacement. **Table 23** summarizes a preservation management strategy that is applicable to bridges:

Table 23 - Bridge Preservation Management Strategy

Activity	Age (Years)	Condition Rating	Service Life Extension (years)
Minor Repairs	10-20	80-90	2-5
Minor Rehabilitation	30	65-70	20
Major Rehabilitation	50-60	50-60	40
Replacement	75	<40	75

Over the life of a bridge, two minor rehabilitations and one major rehabilitation can be anticipated. Minor rehabilitations typically involve repairs to the bridge deck, railing

system, deck joints, and other concrete components. A major rehabilitation would include a full deck replacement.

B. Structural Culvert Management Strategy

Culverts transmit loads through fill to a foundation. Structural culverts are typically designed with a 75-year service life, similar to a bridge. However, in order to achieve this life span, careful selection of culvert material considering the site chemistry and culvert exposure is required. Periodic intervention is also required. **Table 24** summarizes a preservation management strategy that could be applied to culverts:

Table 24 - Culvert Preservation Management Strategy

Activity	Age (Years)	Condition Rating	Service Life Extension (years)
Culvert material/ coating Selection	at Design		
Minor Repairs (patching, re-coating - partial or full, cleanout etc.)	10-20	80-90	2-5
Minor Rehabilitation (e.g. waterproofing, coating)	25	65-70	20
Major Rehabilitation (overlay, invert paving, lining etc.)	35 – 50	50-60	40
Replacement	75	<40	75

In addition to the above-noted preservation approach, the following best management practices should be employed by the Township to extend the service life and reduce lifecycle costs of bridges and culverts:

1. Undertake minor bridge repairs as recommended in the OSIM Inspection reports. Minor repairs are critical as they address problems while they are still small and cost-effective to repair. Repairs may include hand rail repair, pothole patching, concrete patches, repair to joint armouring, tightening steel bridge hardware, regrading of approaches or embankments, erosion prevention, crack sealing, etc.

2. Sweep and clean bridge decks and deck drains each spring. This will allow for inspection of the bridge surface and will promote positive drainage on the deck. In turn, this will eliminate standing water that has the potential to penetrate the wearing surface and cause premature deterioration of the deck.

3. Replace expansion joints as soon as they are damaged or worn. Expansion joints are flexible joints between the bridge deck and the approach slabs on a large bridge. Once damaged, they allow water to penetrate down to the abutments and bearing seats, which causes premature deterioration of these components. Expansion joints are relatively inexpensive, and their timely replacement can delay very costly rehabilitation work on the sub-structure.

4. Complete deck condition assessments (DCA) on any larger structures as outlined in the OSIM reports. DCA's involve exploratory work to properly assess the extent of deterioration of the deck. They will help define the extent of rehabilitation required on a bridge deck.

5. Undertake localized or complete painting of steel girders, truss members, or other steel members as recommended by OSIM inspections.

6. Clean out culverts as need to prevent standing water or sediment collection in the culvert.

7. Stabilize embankments and inlets/outlets to prevent erosion and "piping" around the culvert. Ensure appropriate headwall/cutoff walls or clay seals are in place.

8. At the time of replacement, consider alternatives such as using pre-fabricated steel structures to replace small bridges on rural, low volume roads.

4.4 Asset Management Strategy Buildings – Best Practices Framework

Due to the high cost of new building construction, the Township's general strategy for buildings is to undertake maintenance and upgrades on its existing buildings to ensure that, at a minimum, the expected useful service life of each building is realized, with the goal of using each building beyond its expected service life. Prior to performing major upgrades or rehabilitation on any building, the continued need for the building, its overall condition, and suitability for its intended purpose will be evaluated to ensure that continued rehabilitation is the most appropriate strategy.

4.4.1 Building Best Management Practices

Deterioration of buildings over time varies from one building to another due to the type of construction, the environment, the usage of the building and the level of maintenance over its lifespan. Consequently, no overriding lifecycle management strategy has been recommended in the literature we have seen. Instead, the recommended approach is to program regular inspections to identify potential failures and deterioration, and ensure that problems are addressed before they become critical or cause additional damage.

On an ongoing basis, the Township should employ the following best management practices in maintaining its buildings:

1. Program inspections on a regular basis, including inspections by trained professionals on a periodic basis.
2. Maintain exterior sealants and flashing to avoid water penetration.

3. Ensure grading is such that surface water (drainage) is directed away from the building or into soak away pits.

4. Repair damaged exterior elements (e.g. steel sheathing, roofing, cladding) as soon as the damage occurs to prevent further deterioration.

5. Annually inspect and remove debris from roof drains, gutters, and downspouts.

6. Enact or maintain service contracts for building systems such as HVAC as per manufacturer recommendations or as otherwise deemed necessary.

7. Consider retrofitting buildings to enhance energy conservation.

8. Pump out septic tanks on a regular basis.

9. Maintain heating and HVAC systems through annual cleaning of furnaces and replacement of filters. Provide for humidity and moisture controls to prevent mold.

4.5 Asset Management Strategy Vehicles, Machinery and Equipment – Best Practices Framework

It is generally believed that the optimal approach to managing vehicles, machinery, and equipment is through routine inspections, servicing, and preventative maintenance programs. Maintenance manuals that are supplied at the time of purchase usually outline the appropriate schedules and routines for regular maintenance and servicing.

Through a condition assessment program, staff can make note of equipment or part deterioration so they can schedule to replace or repair worn parts before they fail, thus avoiding the consequences of asset failure.

The general strategy is to replace the asset when the cost/benefit of replacing the asset exceeds the cost/benefit of continued maintenance and rehabilitation. This requires a prediction of the future condition of a given asset. Research into the historical costs of major equipment over time will be incorporated into future versions of this Plan.

4.5.1 Vehicles, Machinery and Equipment Best Management Practices

The Township should employ the following best management practices to maintaining their vehicles, machinery and equipment:

1. Vehicles, machinery and equipment are to be serviced on a regular basis, as per manufacturer recommendations or as otherwise deemed necessary by the manager.

2. Vehicles, machinery, and equipment failures shall be repaired at the earliest opportunity to prevent undue wear and tear.

3. Vehicles, machinery, and equipment shall be used with care.

4. Vehicles, machinery, and equipment will be stored indoors whenever possible.

5. Winter sanding/salting vehicles will be washed after use to remove salt/sand residue.

6. Operators shall be properly trained on the use and care of the vehicles and machinery.

7. Vehicles shall be locked and parked in a safe location, when not parked at their home facility, to prevent the potential for vandalism and theft.

8. Vehicles, machinery, and equipment shall be replaced at or near the end of their services lives.

4.6 Asset Management Strategy- Other Assets

The general strategy for other assets, such as board and joint committee assets, land improvements, street/traffic lights, and sidewalks is to maintain them as needs are identified in order to ensure they are available for use up to or beyond their expected service lives, and to re-evaluate the need for the asset prior to its replacement. Assets are scheduled for replacement when their functionality or condition renders them inadequate to support the intended level of service.

4.7 Integrated Capital Planning

The best management practices outlined above treat each asset group as a stand-alone system (e.g. the road network, the bridge network, etc.), and suggest that optimal capital investment decisions are triggered primarily by the asset's current condition. However, it is also important to understand and implement an integrated capital planning approach to realize maximum value for money invested. As an example, it is not generally cost-effective to replace a road surface in Year 1, only to go back and replace services beneath the road--and have to replace the surface again--5 years later. The scheduling and prioritizing of projects should incorporate an integrated approach across related assets.

The following integrated capital planning practices shall be adopted by the Township in developing work priorities:

A. Road rehabilitation work adjacent to structures planned for replacement shall be considered for tender with the structure replacement work, or after structure work is complete.

B. Road and bridge priorities shall give due consideration to short and long-term development plans (e.g. turning lane requirements, utility cuts, etc.).

C. Any identified road base deficiencies will be rectified when road resurfacing occurs (e.g. increasing road width, creating an emergency bypass).

4.8 Procurement Methods

The Township has in place and shall adhere to its current Purchasing By-Law in retaining services to manage, maintain, and improve its infrastructure assets under this Plan.

Alternative procurement methods shall be explored as the opportunities for such arise, including:

Joint Tendering - e.g. line painting, gravel/salt bulk purchase to realize potential economies of scale

Retainer Services - e.g. engineering, consultant retainers to minimize procurement costs

Shared Services - pooled services with other municipalities.

5.0 Financing Strategy

5.1 Overview

When the Province adopted its long-term infrastructure plan for Ontario ("Building Together") in 2011, one of its guiding principles was that *those who benefit directly from municipal infrastructure should pay for the service, whenever feasible*. While the Province continues to assist municipalities with their infrastructure challenges, it is clear that every municipality is expected to move towards the sustainable management of its own capital assets; to ensure that, as assets need to be repaired, replaced and augmented, each municipality will be able to finance its own requirements.

The Township of Ryerson, as with many rural and small urban municipalities, is faced with sustaining a substantial inventory of capital assets with a limited tax base. As one measure of the Township's current funding shortfall, an oft-cited measure, the "infrastructure deficit", was reported by D.M. Wills Associates Limited to be $23M in 2013. The infrastructure deficit is typically defined as "the added investment that would be required to maintain the Township's infrastructure at appropriate service levels in a good state of repair". Such a measure could be calculated in many ways: it is not clear from the D.M. Wills report how their measure was calculated.

As outlined in the Township's 2021 Ontario 284/09 report, for 2021, another commonly cited sustainability measure—the annual amortization of the historical cost of assets—is estimated to be $350,268. On top of this, the annual amortization of road infrastructure that is already fully amortized but still in use is $197,600. Using the Provincial target "asset sustainability ratio" (defined as annual capital additions/annual amortization expense) of 90%, this would suggest a minimum target level of capital expenditures of the Township of $493,081. This level of annual capital asset funding vastly exceeds the Township's current level of permanent/predictable annual funding for capital assets in the neighborhood of $378,852.

An even more dismal outlook emerges if you recognize that assets will need to be replaced at their current cost, not at their historical cost. A rough approximation of the annual sustainable investment, based on estimated current replacement values, was indicated earlier in the Plan to be $1,421,894, or $557,322 upon elimination of road bases. As part of the development of the initial asset management plan, annual contributions to reserves based on this measure were considered as a proposed long-term municipal target. However, this level of investment so far exceeds any reasonable potential funding level for the Township, from increased taxation, debt financing, and all other known funding sources/strategies, that this target was quickly abandoned.

Instead, as a more practical and feasible long-term objective, the Township has focused on funding its needs, as dictated by its existing asset base and Levels of Service, in the period covered by this Plan. An outline of how these revenues and expenditures were estimated is presented in the sections that follow.

It should be noted that this section of the Plan is not intended to replace the Township's standard budgeting practices, and with minor exceptions only, does not prescribe specific work to be undertaken to maintain the Township's current Levels of Service. Rather, the focus of the revenue and expenditure estimates is to provide a snapshot of the scope of work that is feasible over the planning period at current funding levels, and if the prescribed approach to tax rate increases and debt or other sources of financing are followed.

Historically, capital projects come under the microscope annually when Council engages the annual budgeting process. At that time, current cost estimates and Council/staff/ratepayer priorities are matched with available funding. A key deciding factor on the approved capital projects for the year is inevitably the impact that the capital expenditures, in conjunction with the less discretionary operating expenditures, will have on the tax levy.

Even though the urgency of particular projects changes over time as does the outlook of Council/Council itself, there are advantages to taking a longer view of capital requirements than the current 1-year view (i.e., preparing a longer-term capital budget):

- Increases opportunities for obtaining federal and provincial funding. For virtually all funding available today, it is necessary to demonstrate how the proposed project is a priority in the Township's Asset Management Plan. Additionally, there is often a very short window between the announcement of funding and having "shovel ready" projects for submission.
- Allows the community to avoid sudden changes in its debt service requirements and spikes in its tax rates. By being aware of future needs and projects, the public and Council alike are less likely to view the annual budget as an end in itself, rather than part of a continuous process of expenditure/revenue generation. This might help justify to both the public and Council such things as increasing the annual levy above what is absolutely required in an effort to reserve money for known upcoming capital requirements, or to be more selective about when debt financing is to be used.
- Facilitates the avoidance of costly mistakes such as performing major repairs to assets that are likely to be replaced in the near future.
- Focuses attention on community objectives and fiscal capacity. As a result, staff, Council and the public are more likely to consider how proposed asset expenditures will contribute to the desired service levels and the trade-offs that must be made to be affordable.

This section of the Plan provides a ten-year roadmap that outlines the most critical capital needs of the Township, the timing for these works as well as the anticipated costs and anticipated funding. Projects included relate to renewing, rehabilitating, or replacing existing assets, rather than to expanding the existing base.

It should be noted that this section of the Plan is not intended to replace the Township's standard budgeting practices, and does not necessarily reflect the precise timing of

revenue and expenditures currently being contemplated by Council. Further, by July 1, 2025, Council will need to establish target Levels of Service for all asset categories, and in the course of these deliberations will make future decisions that substantively change the timelines and breadth of projects to be completed during the planning period.

5.2 Expenditures

A summary of the anticipated expenditures and related sources of funding is presented in **Appendix A**. The expenditures summarized in this appendix are supported by a detailed asset replacement schedule for each class of assets. The detailed schedule is included in this Plan in **Appendix B**.

For the purposes of forecasting future expenditures, an **annual inflation factor of 2% has been used**.

Highlights of the expenditures follow:

A. Roads

Prioritization and recommendations for planned capital improvements were documented in the Road Needs Study (2020). The identification of needs focused on the road characteristics that are most likely to require significant maintenance costs (should the deficiencies remain) or that are likely to impact the overall operations and service of the road (surface condition; surface type; surface width; structural adequacy; drainage). Excluding road widening needs, which are not considered critical needs, approximately $3.65 M (2020 $) of required improvements in the next ten years were identified. These needs were prioritized, taking into consideration the road improvement cost, the physical road condition and traffic volumes.

As a general rule, resurfacing requirements for low volume roads (< 50 average annual daily traffic (AADT)) were omitted from the schedule. As per the Township's prescribed Level of Service, roads below 50 AADT shall be maintained through regular maintenance only. However, some such roads have historically been maintained to a higher standard and were therefore scheduled for resurfacing in the 10-year capital plan. As higher-priority projects emerge during the Plan period, it is probable that funds for these roads will be reallocated to other areas of need.

The identified needs have been broken down into a project list for 2022-2031, presented in **Appendix B**. Total Road expenditures (inflated to current $) over the 10-year period are $2,164,051, ranging from a low of $139,392 in 2025 to a high of $317,381 in 2027.

Note that the preservation management approach also calls for annual calcium applications, ditching, brushing, and grading. These costs have been

included in the Maintenance Activities section of the expenditure summary, as they are considered in the annual operating budget.

B. Bridges and Culverts

The draft 2021 OSIM inspection report identified $75,000 of required repairs on the Township bridges. In addition, the Nipissing Road Bridge is scheduled for replacement within the next 5 years, at an estimated cost of $795,000. Further information is required on the East Road Bridge, which is a shared asset with Armour Township.

The ten-year Plan includes completing the balance of the repair work identified in the OSIM inspection in Years 1 to 5 of the Plan. A placeholder expenditure for $40,000 was also included in 2030 for additional needs that may be identified in a future OSIM report.

A large culvert replacement project is required in 2022 on Peggs Mountain Road, estimated at $38,100. Further, an annual non-specific allowance of $10,000, adjusted for inflation, was also included as a placeholder for future bridge and/or sunken culvert replacements.

Total expenditures over the 10-year period are estimated at $1,094,303.

The 10-year plan should be revisited after each biennial structure inspection and updated every two years.

C. Buildings

Required capital expenditures for buildings have been based on buildings reaching the end of their useful service lives (calculated from the date of the last major refurbishment and as determined by the Township's current amortization policy). With the exception of the community hall (museum)-which is not likely to be replaced if the building becomes unusable --all of the Township's buildings few relatively new or have had recent upgrades. For example, in the past two years the main Township building has undergone interior renovations, a roof replacement, and septic and ventilation system upgrades.

The Museum structure is quite old and requires repairs to the siding, lighting, doors, windows, insulation, and roof. Historically, Council has not allocated funds from the annual budget for capital repairs to this building, necessitating the procurement of external grant funding. Allocations for future repairs have been included in 2023 and 2026, with corresponding unconfirmed government grants incorporated into the financing section.

D. Vehicles

$702,094 of expenditures for the replacement of existing vehicles have been included in the 10-year plan. The expenditure for each vehicle has been recorded in the year staff is currently contemplating replacing it.

E. Machinery and Equipment

$88,636 of expenditures for the replacement of existing equipment that will have reached the end of its useful service life (as determined by the Township's current amortization policy) have been included in the 10-year plan. The expenditure is recorded in the year the machinery/equipment is fully amortized.

F. Shared Services Assets

At the present time the Township has limited control over the capital asset purchases of its shared services, and limited information on the condition and future replacement needs for the relevant assets. In past iterations of the Plan, the current sustainable level of investment (as calculated by current asset replacement value/expected service life * the Township's current cost share %) was included as an approximation of the required annual investment for these services. However, for the purposes of this Plan, the Township has focused solely on the Fire Department, which is under its administration, and excluded any costs related to Shared Services which are not under its control. Total Fire expenditures of $148,077 have been identified in the 10-year forecast.

The Township will be required to include information on all shared service assets in the Plan by July 1, 2024.

G. Other Assets

Expenditures over the ten-year period are $95,467. This includes repairs to the boat launches at Rockwynn Landing and Bartlett Lake, as well as a non-specific allowance for the replacement of computer hardware and software.

In total, the forecasted investment in capital asset refurbishment and replacement is $4,337,628 in the 10-year period, ranging from a low of $245,386 (2025) to a high of $1,023,055 (2024). Additionally, a total of $610,951 in non-infrastructure solutions and $8,589,508 in maintenance costs are forecasted for the 10-year period. Total expenditures, including O&M costs, capital asset renewal/rehabilitation, debt repayments, and net transfers to reserves are forecasted to be $14,802,774.

5.3 Revenue (Sources of Funding)

Revenue and other funding sources (i.e., transfers from reserves and debt financing) available for financing the above-noted expenditures is also presented in **Appendix A**. Each identified source is discussed below:

A. Taxation

In the 2021 budget, an estimated **$288,852 of the general taxation levy** (2020 $283,188; 2019 $277,634) **is estimated to have been available for financing past, current and future capital asset expenditures**. These are represented respectively by: *debt repayments* re: the Western Star, grader, road construction, and fire equipment (past capital asset requirements); *capital expenditures* (current capital asset requirements); and *net transfers to reserves* (future capital asset requirements).

Working from the 2021 base, taxation available for financing net capital asset expenditures has been increased by 2% annually. This is a reasonable approximation of what would generally happen in the combined annual operating and capital budget (i.e., small increases in the tax levy annually to compensate for rising prices due to inflation).

B. **Additional Capital Tax Levy**

In 2021, the total general and school board tax base was approximately $2.4 M. If the Township were to incorporate a 1% capital-specific tax levy increase into their annual budget, $24,108 in additional funds would be raised in year 1 of the Plan; this would increase to $48,457 in year 2. By the end of the 10-year Plan period, an additional $1.37 M would be raised to finance current and future capital purchases.

In the Plan, the extra income generated by a 1% capital-specific tax levy has not been included as a source of funding for current capital projects as the 10-year Capital Plan has been designed with consideration only to current levels of service. It is worth considering that, if an accumulating 1% tax levy were to be implemented, by year ten of the Plan the Township would have sufficient permanent capital funding to begin implementing the preservation management strategy.

C. Senior Government Grants

Future federal gas tax funding has been estimated to grow with inflation over the Plan period, with the accumulated unused balance being brought into revenue in Year 1. Grant revenue also includes $50,000 related to the Provincial OCIF formula-based annual funding, with unused revenue also being fully recognized in Year 1.

Two other *speculative* senior-level grants have been included in the Plan as follows:

- A 67% grant related to the replacement of the Nipissing Road Bridge.
- $45,000 in miscellaneous grant funding related to the school house

A grant application for the Nipissing Road Bridge was unsuccessfully submitted in early 2019. However, it is unlikely that this project would be undertaken as planned without this level of senior-government assistance.

D. Transfers to and from Reserves

The anticipated capital-related 2020 year-end reserve balance carried forward to Year 1 of the Plan is expected to be $859,649. Approximately 30% of this is earmarked for joint services, with the balance earmarked for public works and general capital purposes.

While the Township's overall reserve balance places it in the "low risk" category in the MMAH's annual financial indicator calculations, less than one year's amortization of the historical cost of the Township's assets has been reserved for capital purposes.

In an effort to move towards sustainability—to ensure that there are sufficient financial resources in the future to replace/augment capital assets to support the delivery of the Township's services—annual transfers to reserves for roads capital purposes of $40,000 have been incorporated into the Plan throughout the planning years, with spikes to $60,000 in 2022 and $65,000 in 2028 to offset anticipated proceeds from the sale of surplus assets. Additionally, $50,000 in general capital reserve transfers has been included annually as an offset for future operating and/or capital surpluses. These reserves are designed to help facilitate future investments in building, bridge, and vehicle assets for which no other required investment is anticipated over the term of this Plan.

Transfers from reserves are recorded to finance the Township's required contribution to the purchase of a frontline pumper in 2022, to replace one tandem plow in 2023, and to partially finance the replacement of the Nipissing Road Bridge. Although not recorded in the Plan, the Township may need to draw from reserves between 2027-2031 to help finance the resurfacing of its LCB roads depending on future Council decisions regarding target levels of service.

Following this approach, the overall capital reserve balance will increase to $1,605,085 by the end of the Plan period. As noted above, an alternative reserve contribution approach could be to earmark all funds raised by the additional capital levy for reserve replenishment.

E. Long-term Debt Financing

Unlike many of its local counterparts, the Township is accustomed to debt financing and in recent years has had debt servicing charges slightly higher than what is considered "low risk" from the perspective of the Ministry of

Municipal Affairs' annual Financial Performance Indicators. Consequently, before new debt financing is considered in the annual budgeting process, Township staff analyse the impact the proposed debt will have on its' debt servicing level to ensure that the future charges do not significantly exceed the target of 5% of operating revenue.

For the purposes of the Plan, $310,000 in debt financing has been recorded for the purchase of the '13 replacement vehicle. Debt repayments have been recorded assuming a 5-year, 4% loan. In conjunction with repayments of its existing debt, this level of borrowing is expected to keep the Township within the low or medium risk category. This is illustrated in **Appendix G.**

Further discussion of long-term debt financing is presented in **Appendix F**.

F. Other Financing

Forecasted proceeds from the sale of the '05, '07, and '13 plows have been recorded in the Plan. The Township has historically drawn from Parkland reserves to help finance capital expenditures at the Arena, however these expenditures were not included in this version of the Plan and therefore no Parkland transfers have been recorded.

In total, the forecasted sources of funding for capital-related expenditures is expected to be $5,739,306.

5.4 Funding Shortfall/Excess Relative to Financial Requirements

The resulting annual funding excesses for each year of the Plan are also presented in **Appendix A**. In total, the cumulative forecasted excess for the 10 years is projected to be $91,991. Within the 10-year period, the annual excesses are highly variable.

Note that the project schedule shown in **Appendix B** was developed by prioritizing and grouping projects based on factors such as condition, frequency of use, risk of failure, and location, and matching expenditures to total funding available in a given year. Therefore, not all asset replacements becoming due during the planning period have been incorporated into the Plan. In reality, if all assets were replaced on schedule, total capital expenditures during the 10-year period would be $4,498,951, representing a funding shortfall of $69,332. This figure grows when asset replacements for all non-Fire shared services are taken into consideration.

6.0 Risks to the Asset Management Plan

Simply producing a documented asset management plan doesn't mean that the benefits of asset management, as outlined in **Section 2**, will actually be realized. As with any plan, there are inherent risks that may jeopardize its execution or may prevent the achievement of its expected outcomes. The following is a summary of the risks that are known to exist today:

- Non-commitment by Municipal Council or Staff to the Plan. Implementing asset management best practices will require a significant overhaul of existing operational practices. Staff and Council must work collectively to ensure that recommended practices and procedures are internalized and implemented.
- Staffing Levels and Turnover. Taking a proactive approach to asset management requires more staff time, effort and knowledge. It is unrealistic to believe that this additional work can be accomplished without increasing staff levels and potentially restructuring job responsibilities. Additionally, the loss of knowledge and experience that will accompany the retirement of existing staff may impede the Township's ability to continue providing levels of service that had previously been possible.
- Inadequate levels of funding. It has already been noted that the implementation of the preservation management approach is not likely to be feasible to any meaningful degree in the short term. An understanding of the benefits of proactive asset management is of little value if it can't be put into practice.
- Capital requirements of district boards. The requirement to fund large capital expenditures of the local district boards (i.e., home for the aged, health unit and DSSAB), over which the Township has no control, will detract funds away from the Township's own capital assets.
- Emergencies, premature asset failures and other unforeseen events which could direct funds away from the Plan.
- Change in legislative requirements, which may influence Levels of Service.

As is the case in many small rural municipalities, particularly in Northern Ontario, the simple reality is that there is a limited availability of funds, and a related limited ability to grow funding, in order to manage the Township's infrastructure. While this Plan sets out to manage the competing infrastructure priorities at the lowest combined lifecycle costs, the Plan will be subject to revision and refinement as new approaches/technologies are developed, new funding strategies are found, and the expectations of the Township (Council, staff, and ratepayers) evolve.

Appendix A
Yearly Revenue and Expenditure Summary

The yearly revenue and expenditure summary is prepared in a separate Excel spreadsheet. It is an integral component of the Plan

Appendix B
List of Projects – 2022 to 2031

The list of projects is prepared in a separate Excel spreadsheet. It is an integral component of the Plan

Appendix C
Cost to Maintain Current Levels of Service

The budget history is prepared in a separate Excel spreadsheet. It is an integral component of the Plan

Appendix D

Guideline Road Expenditure Budget - Unconstrained Financing

Guideline Road Expenditures Budget-Unconstrained Financing

1. Preservation Management Approach – Road Resurfacing

In a financially unconstrained situation, an annual resurfacing strategy is recommended as follows based on typical degradation rates for roads:

I. Surface Treated Roads:
- 15.2 km in the existing inventory of surface treated roads (LCB)
- Degradation rate 0.625 km/year (rating drops from "10" to "5" over an 8-year period)
- Annual Resurfacing target of 1.9 km/year
- Annual Budget of $106,400 (1.9 km/yr. x $56,000/km **ST1***) for resurfacing
  ***ST1 – Double Surface Treatment**

II. Gravel Roads:

Gravel roads require regular maintenance. Maintenance includes regular grading and reapplication of new gravel. Application of 100mm of new gravel is recommended every 10 years for all gravel roads.

- 94.3 km in the existing inventory of earth/gravel roads (43.1 km < 50 cars/day)
- 100mm gravel every 10 years
- Annual Gravelling of ~10 km/year
- Granular A ($36,000/ km)
- Annual Budget $360,000 (10 km/yr.* x $36,000/km **G***)** for gravelling
- Annual Budget Excluding Low Volume Roads $183,600 (5.1 km/yr. * $36,000/km **G***)** for gravelling
  ***G – Gravel**

* Based on a 10-year gravel resurfacing cycle.

** Cost based on supply and application of gravel by external forces. Some roads being resurfaced using crushed granite.

The total "ideal" resurfacing program, (surface treatment and gravel) for the entire municipal road network, per the calculations above, is estimated at $466,400 per year (2020 $). Consideration could be given to removing all roads with less than a specified volume of traffic (e.g. 50 vehicles/day), as it is generally accepted that these roads may be maintained strictly through maintenance activities. If this approach was taken, the total resurfacing program cost would be reduced to $290,000/year.

2. Preservation Management Approach - Maintenance Expenditures for Roads

Regular maintenance in the form of grading, roadside ditch cleanout and clearing needs to be undertaken in order to extend the useful service life of the existing roads. A commitment of resources is necessary to ensure a viable annual ditching and clearing program. These activities are considered two of the least expensive and most beneficial preventative maintenance activities to facilitate realizing the full surface service life.

A ditching and brushing maintenance budget is calculated and recommended as follows:

- Ditch/Brush the entire road network on a 10-year cycle.
- 219.9 lane km of road – 22.0 lane km of ditching/brushing annually.
- Ditching Production Rate – 0.5km / day (2 sides of the road).
- Brushing Production Rate – 1 km /day (2 sides of the road).
- Approximately 33 person-days (or ~6-7 weeks) of Brushing/Ditching.

In the 2020 Road Needs Study, benchmark costs of $12/m for ditching and $140/hr for brushing. On that basis, if that work were to be contracted out, the estimated annual brushing/ditching requirement would be approximately $279,400.

Alternatively, the Township could use its own forces and equipment and potentially realize cost savings in undertaking this work. Assuming the Township dedicated one public works person to this task, at an estimate rate of $60/hr. (including payroll benefits burden) the resulting out-of-pocket cost would be $2,400/week or $19,800. The cost of the equipment and dump truck drivers has been omitted to permit direct comparison to the above Contractor costing. Since the Municipality has the necessary ditching/brushing equipment to undertake the work, additional capital expenditure for equipment has not been factored in.

Total Annual Brushing/Ditching Allowance:
External Forces $ 279,400
Internal Forces $ 19,800

Road grading activities are performed by Township forces and with existing Township equipment, and consequently, a separate road grading maintenance budget has not been prepared.

Appendix E
Life Cycle Cost Analysis

Life Cycle Cost Analysis
Pavement Management

The following life cycle costs analysis compares three different municipalities--Township 1, Township 2 and Township 3--each with three distinct approaches to pavement management. For this analysis we will assume each of the three municipalities have 7000 m^2 of pavement i.e. 1km of asphalt paved road that is 7m wide. In each scenario, the road is assumed to have been constructed in 2013 and will operate under normal traffic loading.

The Life Cycle Cost Analysis (LCCA) assumes no user costs. The LCCA uses a discount rate of 2.5% / year.

The LCCA shows the three different municipalities and tracks their pavement management decisions and related condition over the specified time period. Township 1 represents decisions made based on strategic preventive maintenance and rehabilitation (M&R), Township 2 represents decisions based on no preventive M&R and Township 3 represents decisions based on resurfacing only.

The figure below illustrates a time- pavement condition plot for each Township.

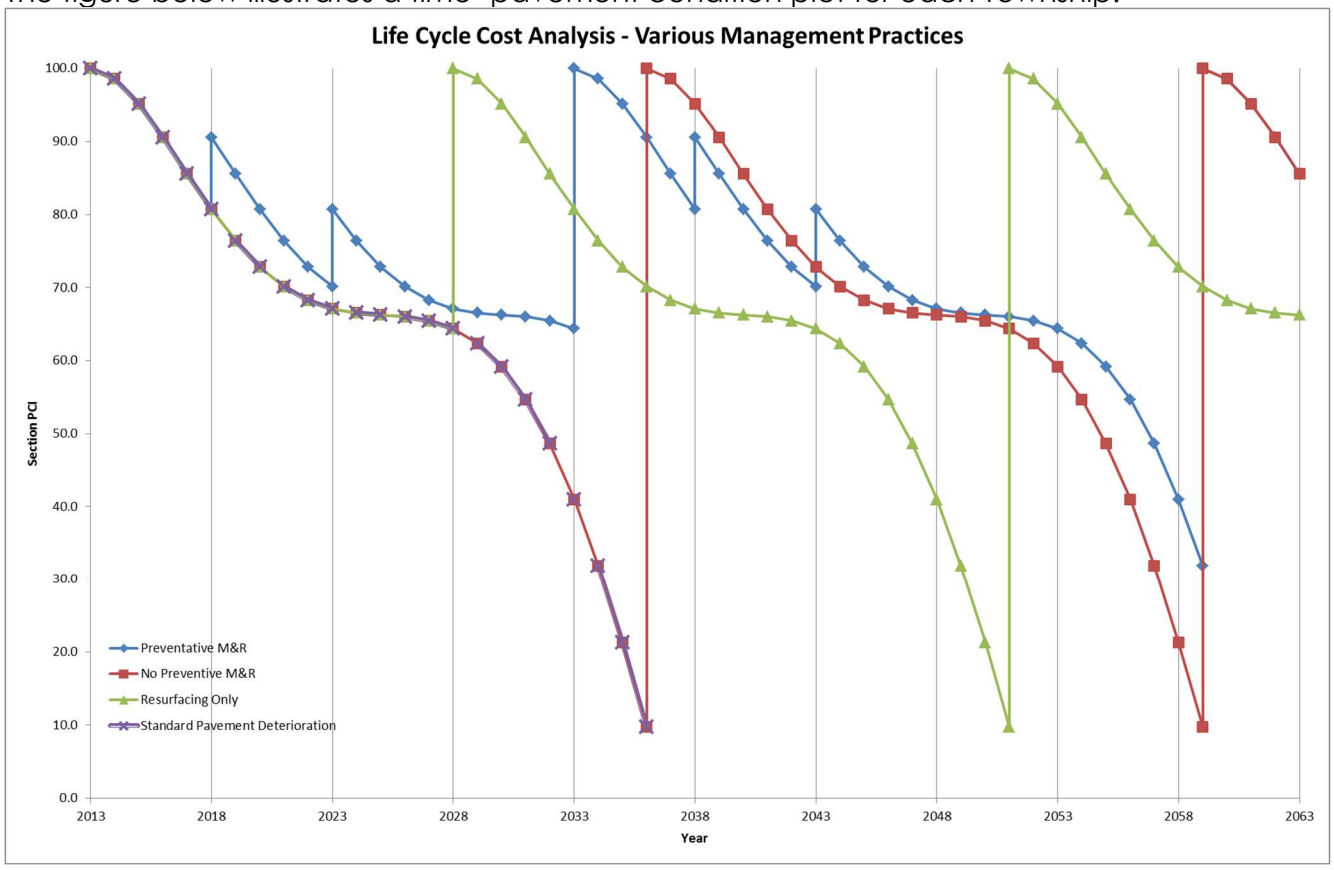


Figure 8.2. Time-Condition Plot for 3 Municipalities

The costs associated with the corresponding maintenance and rehabilitation decisions are outlined in the following tables:

Preventive M&R									
Year	**Age**	**Treatment**	**Δ PCI**	**PCI_q**	**Quantity**	**Unit**	**Unit Cost**	**Total Cost**	**Present Worth**
		-- Annual Ditching/Clearing --							
2018	**5**	**Localized Preventive - Rout and Seal**	81-90	Satisfactory-Good	1000	m	$1.50	$1,500.00	**$1,325.78**
2023	**10**	**Global Preventive - Slurry Seal**	70-81	Satisfactory-Good	7000	m^2	$6.50	$45,500.00	**$35,544.53**
2033	**20**	**Surface Course**	64-100	Poor-Good					
		Mill and Dispose of Surface Course			7000	m^2	$12.00	$84,000.00	
		50mm Surface Course			892.5	t	$135.00	$120,487.50	
								$204,487.50	**$124,792.78**
2038	**25**	**Localized Preventive - Rout and Seal**	81-88	Satisfactory-Good	4500	m	$1.50	$6,750.00	**$3,640.89**
2043	**30**	**Global Preventive - Slurry Seal**	68-78	Satisfactory-Good	7000	m^2	$6.50	$45,500.00	**$21,691.79**
2048	**35**	**Safety/Stopgap Maintenance - AC Patching/Leveling**	N/A	N/A	5%	m^2	$30.00	$10,500.00	**$4,424.40**
2053	**40**	**Safety/Stopgap Maintenance - AC Patching/Leveling**	N/A	N/A	10%	m^2	$30.00	$21,000.00	**$7,821.04**
2058	**45**	**Full Reconstruction**	32-100	Serious-Good					
		Remove Asphalt Full Depth			7000	m^2	$15.00	$105,000.00	
		Add and Compact Corrective Aggregate/Correct Crossfall (25mm avg.)			420	t	$35.00	$14,700.00	
		40mm Base Course			686	t	$125.00	$85,750.00	
		50mm Surface Course			892.5	t	$135.00	$120,487.50	
								$325,937.50	**$107,290.28**
2063	**5**	**Localized Preventive - Rout and Seal**	81-90	Satisfactory-Good	1000	m	$1.50	$1,500.00	**$436.41**
		Final PCI in 2063:	**90**	**Good**				**Net:**	**$306,967.90**
								Residual Value:	**$85,346.08**
								Total Cost:	**$221,621.82**

The policy of Township 1 is to strategically intervene with preventative maintenance measures over the course of the pavement's service life. Two significant maintenance measures are performed on the pavement at various times and ultimately extend the service life of the pavement, prorating the total cost of the pavement over a longer period of time. Eventually, a full reconstruction is required and this cycle repeats. The total life cycle costs are substantially less when compared to Township 2 and 3, at a total of $221,622 over 50 years.

No Preventive M&R									
Year	**Age**	**Treatment**	**Δ PCI**	**PCI_q**	**Quantity**	**Unit**	**Unit Cost**	**Total Cost**	**Present Worth**
2023	**10**	**Safety/Stopgap Maintenance - AC Patching/Leveling**	N/A	N/A	5%	m^2	$30.00	$10,500.00	**$8,202.58**
2028	**15**	**Safety/Stopgap Maintenance - AC Patching/Leveling**	N/A	N/A	10%	m^2	$30.00	$21,000.00	**$14,499.78**
2030	**17**	**Safety/Stopgap Maintenance - AC Patching/Leveling**	N/A	N/A	20%	m^2	$30.00	$42,000.00	**$27,602.19**
2036	**23**	**Full Reconstruction**	10-100	Poor-Good					
		Remove Asphalt Full Depth			7000	m^2	$15.00	$105,000.00	
		Add and Compact Corrective Aggregate/Correct Crossfall (25mm avg.)			420	t	$35.00	$14,700.00	
		40mm Base Course			686	t	$125.00	$85,750.00	
		50mm Surface Course			892.5	t	$135.00	$120,487.50	
								$325,937.50	**$184,707.88**
2043	**7**	**Safety/Stopgap Maintenance - AC Patching/Leveling**	N/A	N/A	5%	m^2	$30.00	$10,500.00	**$5,005.80**
2048	**12**	**Safety/Stopgap Maintenance - AC Patching/Leveling**	N/A	N/A	10%	m^2	$30.00	$21,000.00	**$8,848.79**
2053	**17**	**Safety/Stopgap Maintenance - AC Patching/Leveling**	N/A	N/A	20%	m^2	$30.00	$42,000.00	**$15,642.09**
2059	**23**	**Full Reconstruction**	10-100	Poor-Good					
		Remove Asphalt Full Depth			7000	m^2	$15.00	$105,000.00	
		Add and Compact Corrective Aggregate/Correct Crossfall (25mm avg.)			420	t	$35.00	$14,700.00	
		40mm Base Course			686	t	$125.00	$85,750.00	
		50mm Surface Course			892.5	t	$135.00	$120,487.50	
								$325,937.50	**$104,673.45**
		Final PCI in 2063:	**86**	**Good**				**Net:**	**$369,182.56**
								Residiual Value:	**$81,552.92**
								Total Cost:	**$287,629.64**

The policy of Township 2 is to simply construct the pavement and wait until serious deficiencies begin to appear before acting. This approach unfortunately remains common still today. Over the last period of the pavement's life, maintenance is required to ensure safety and operation until the pavement becomes completely destroyed. Once the pavement has failed, a complete reconstruction is carried out restoring the pavement to new condition. This cycle repeats again until a second reconstruction is required. The total costs are substantial and total $287,630 over 50 years.

Resurfacing Only									
Year	**Age**	**Treatment**	**Δ PCI**	**PCI_q**	**Quantity**	**Unit**	**Unit Cost**	**Total Cost**	**Present Worth**
2028	**15**	**Surface Course**	64-100	Poor-Good					
		Mill and Dispose of Surface Course			7000	m^2	$12.00	$84,000.00	
		50mm Surface Course			892.5	t	$135.00	$120,487.50	
								$204,487.50	**$141,191.58**
2051	**23**	**Full Reconstruction**	10-100	Serious-Good					
		Remove Asphalt Full Depth			7000	m^2	$15.00	$105,000.00	
		Add and Compact Corrective Aggregate/Correct Crossfall (25mm avg.)			420	t	$35.00	$14,700.00	
		40mm Base Course			686	t	$125.00	$85,750.00	
		50mm Surface Course			892.5	t	$135.00	$120,487.50	
								$325,937.50	**$127,534.43**
2067	**15**	**Surface Course**	64-100	Poor-Good					
		Mill and Dispose of Surface Course			7000	m^2	$12.00	$84,000.00	
		50mm Surface Course			892.5	t	$135.00	$120,487.50	
								$204,487.50	**$53,898.67**
		Final PCI in 2063:	**66**	**Good**				**Net:**	**$322,624.67**
								Residiual Value:	**$62,587.12**
								Total Cost:	**$260,037.55**

The policy of Township 3 is periodic resurfacing. The pavement is constructed and time passes until early signs of serious distress are observed. This occurs after the time when preventive maintenance is neither appropriate nor possible, but before the pavement becomes completely destroyed. Resurfacing is performed and restores the pavement to almost new condition. The pavement then deteriorates for the remainder of its life, requiring significant maintenance in the last years before it becomes completely destroyed. A full reconstruction is then carried out and the cycle continues. The total costs are in between that of Township 1 and 2 at $260,038 over 50 years.

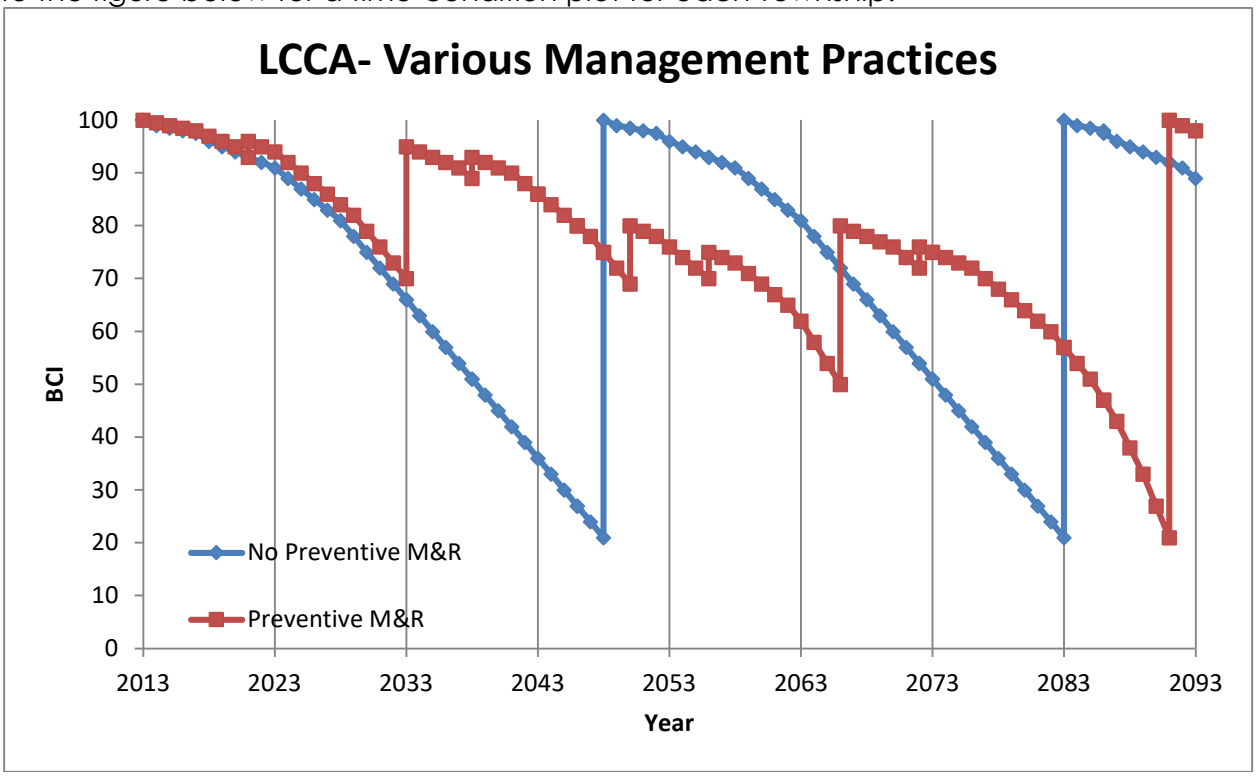
It may be easy to see upfront cost savings by understanding that as long as any costs associated with maintaining the pavement are deferred as long as possible, money will be saved. The reality is that extending a pavements service life prorates the total cost of the pavement over a longer period of time and ultimately becomes more economical in the long run. If preventive maintenance measures are strategically planned and carried out then the service life of the pavement can be maximized and substantial reconstruction costs can be deferred for longer periods of time. In a time when economy and efficiency are becoming more and more important, this type of proactive management is essential in the management of infrastructure.

Life Cycle Cost Analysis
Structures

The following life cycle costs analysis compares two different management practices for municipalities managing their structure inventory. For the analysis we will assume each of the municipalities have an identical bridge as a part of their inventory. The bridges both have the same initial construction cost, and are identical in terms of structure type and construction.

For the analysis, each Township has in their inventory a two-lane, single span bridge with concrete barrier walls and deck supported by prestressed concrete girders on concrete abutments. The bridge has expansion joints at either end and a paved deck. The road maintenance policy of each Township is to use salt as a winter roadway de-icer. The Life Cycle Cost Analysis (LCCA) assumes no user costs.

The LCCA shows the municipalities and tracks their structure management decisions over a 90-year time period. Township 1 represents decisions made based on strategic preventive M&R and Township 2 represents decisions based on no preventive M&R. Refer to the figure below for a time-condition plot for each Township.



Time-Condition Plot for 2 Municipalities

The costs associated with the corresponding maintenance and rehabilitation decisions are outlined in the following tables:

Preventive M&R

Year	Treatment	Δ BCI	Quantity	Unit	Unit Cost	Total Cost	Present Worth
2021	**Rout and Seal Cracks**	93-96	250	m	$2.50	$625.00	**$512.97**
2033	**First Rehabilitation**	70-95					
	Patch, Waterproof and Pave Deck		480	m2	$600.00	$288,000.00	
	Misc Concrete Patching		50	m2	$2,000.00	$100,000.00	
						$388,000.00	**$236,785.13**
2038	**Rout and Seal Cracks**	89-93	250	m	$2.50	$625.00	**$337.12**
2050	**Barrier Wall Replacement**	69-80	39	m3	$2,500.00	$97,500.00	**$39,104.04**
2056	**Rout and Seal Cracks**	70-75	200	m	$2.50	$500.00	**$172.92**
2066	**Second Rehabilitation**	50-80					
	Patch, Waterproof and Pave Deck		480	m2	$600.00	$288,000.00	
	Misc. Concrete Patching		100	m2	$2,000.00	$200,000.00	
	Bearing Replacement		10	ea.	$5,000.00	$50,000.00	
	New Barrier Walls		39	m3	$1,450.00	$56,550.00	
						$594,550.00	**$160,628.84**
2072	**Rout and Seal Cracks**	72-76	350	m	$2.50	$875.00	**$203.84**
2091	**Structure Replacement**	21-100					
	Piles		1500	m	$350.00	$525,000.00	
	Abutments and Wingwalls		300	m3	$1,100.00	$330,000.00	
	Girders		450	m	$1,000.00	$450,000.00	
	New Concrete Deck		300	m3	$1,250.00	$375,000.00	
	New Barrier Walls		39	m3	$1,450.00	$56,550.00	
	Approach Slabs		56	m3	$575.00	$32,200.00	
						$1,768,750.00	**$257,753.73**
	Final BCI in 2093:	**98**				**Net:**	**$695,498.58**
						Residual Value:	**$240,427.03**
						Total Cost:	**$455,071.54**

No Preventive M&R

Year	Treatment	Δ BCI	Quantity	Unit	Unit Cost	Total Cost	Present Worth
2048	**Structure Replacement**	21-100					
	Piles		1500	m	$350.00	$525,000.00	
	Abutments and Wingwalls		300	m3	$1,100.00	$330,000.00	
	Girders		450	m	$1,000.00	$450,000.00	
	New Concrete Deck		300	m3	$1,250.00	$375,000.00	
	New Barrier Walls		39	m3	$1,450.00	$56,550.00	
	Approach Slabs		56	m3	$575.00	$32,200.00	
						$1,768,750.00	**$745,300.07**
2083	**Structure Replacement**	21-100					
	Piles		1500	m	$350.00	$525,000.00	
	Abutments and Wingwalls		300	m3	$1,100.00	$330,000.00	
	Girders		450	m	$1,000.00	$450,000.00	
	New Concrete Deck		300	m3	$1,250.00	$375,000.00	
	New Barrier Walls		39	m3	$1,450.00	$56,550.00	
	Approach Slabs		56	m3	$575.00	$32,200.00	
						$1,768,750.00	**$314,047.89**
	Final BCI in 2093:	**64**				**Net:**	**$1,059,347.96**
						Residual Value:	**$157,013.57**

Total Cost:	$902,334.39

*Costs are for materials only and do not include construction costs

The policy of Township 1 is to strategically intervene with maintenance measures over the course of the structure's service life. Maintenance measures are performed on the structures at various times and ultimately extend the service life of the structure, prorating the total cost of the structure over a longer period of time. Eventually, a full reconstruction is required and this cycle repeats. The total costs are fractional compared to those of Township 1. This difference in decision making introduces significant savings throughout the cycle.

The policy of Township 2 is to simply build the structure and wait until serious deficiencies become evident. At the last possible minute, a complete reconstruction is carried out restoring the structure to perfect condition. This cycle repeats again until a second reconstruction is required. The total costs are substantial. Unfortunately this approach still remains common today as municipalities are faced with an aged structure network and limited funds for maintenance.

It may be easy to see upfront cost savings by understanding that as long as any costs associated with maintaining the structure are deferred as long as possible, money will be saved. The reality is that extending a bridge or culvert's service life prorates the total cost of the structure over a longer period of time and ultimately becomes more economical in the long run. If preventive maintenance measures are strategically planned and carried out then the service life can be maximized and substantial reconstruction costs can be deferred for longer periods of time. In a time when economy and efficiency are becoming more and more important, this type of proactive management is essential in the management of our resources.

The difficulty faced by most municipalities is related to "breaking the cycle." With an aged infrastructure and many structures with condition beyond the point of preservation management techniques, substantial funds are required to address those most significantly deteriorated structures leaving little funds for keeping the good bridges good.

Appendix F
Low Risk Long-term Debt Level

Low Risk Long-term Debt Level

In the Building Together guide, the Province suggested that as part of a long-term capital asset financing strategy "***there may be a need for some municipalities to revisit their "zero debt" policies***. *Debt financing, such as debentures, loans, and construction financing agreements, helps to spread the cost of expensive capital projects over time so that both current and future users of services share the burden*."

When viewed in conjunction with another of the Province's guiding principles—"*those who benefit directly from municipal infrastructure should pay for the service*"—it seems clear that, rather than having to borrow money itself to pay for grants to individual municipalities, the Province is expecting individual municipalities, the beneficiaries of the related municipal infrastructure, to take on long-term debt themselves. In light of the Province's philosophy, the Township is prepared to use long-term debt to finance capital projects to a "reasonable level".

The Ministry of Municipal Affairs (MMA) prepares a "Financial Indicator Review" (Review) annually for each municipality, based on the Financial Information Return (FIR) submitted. The Review classifies the Township as "Low", "Moderate" or "High" Risk for each of the reported measures. There are three debt-related measures on the "Financial Indicator Review":

1. Debt servicing cost as a % of total operating revenue: low risk = < 5%
2. Net financial assets or net debt as a % of total operating revenue: low risk > -20%
3. Net financial assets as a % of own purpose taxation plus user fees : low risk > -50%

Based on its 2019 FIR, the Township calculated what its Low Risk level of debt threshold would be using these three measures, and determined that the most restrictive measure was the debt servicing as a % of operating revenue. Using this measure, a low risk level of borrowing is in the neighbourhood of $1,232,000 based on a 10-year repayment term and 3% interest rate. In other words, at any point in time, the total initial amount of borrowing that the Township could be repaying is $1,232,000 over a 10-year term @3% ($661,500 over a 5-year term @ 3%) to be classified as "Low Risk" based on the measures in the Review.

Note that the **maximum** allowable outstanding debt of the Township (estimated from the commonly-cited "Annual Debt Repayment Limit" of the Township, using a 10-year repayment and 3% interest) is approximately five times this amount (2020 limit of approximately $4.6 M).

The following outlines an approach that could be used to gradually move to this threshold by the Township, once all of its existing debt is repaid:

a) in each year, an equivalent amount of new debt could be incurred to finance capital expenditures. The annual amount of $123,200 new debt was calculated assuming that the borrowing rate will be 3%, and all debt will be repaid over 10 years.

b) By the 10th year, by incurring approximately $123,200 new debt each year, the Township will have reached its threshold level of repayments of $144,500 and will have outstanding debt of approximately $435,000.
c) This pattern of borrowing and repaying is sustainable indefinitely. However, **by the 10th year this strategy will not produce any additional capital asset financing**, since the debt repayments (principal and interest) will exceed the new debt incurred by the interest portion of the repayments.

Rather than phasing in debt over time, it is more likely that new long-term debt will be linked to the purchase of specific capital expenditures, and will only be agreed to after careful consideration of other available alternatives (such as deferring/reducing planned capital expenditures). The actual decision to incur debt for specific items will occur as a result of the annual budgeting procedures.

Appendix G
Tally of Cumulative Debt Repayments

The tally of cumulative debt repayments is prepared on a separate Excel spreadsheet

Appendix H
Strategic Asset Management Policy

Purpose

The purpose of this policy is to provide guidance for capital asset management plans and other capital asset-related decisions for the Township. The adoption of a policy is one of the requirements of the Municipal Asset Management Planning Regulation under the *Infrastructure for Jobs and Prosperity Act, 2015*.

Policy Statement

The Township of Ryerson is committed to improving the long-term resilience and sustainability of its infrastructure. To accomplish this, the Township must have a policy to guide its asset management decisions which promotes best practices and links asset management planning to budgeting, operations, and other municipal planning activities.

Asset Management Principles

The following principles will guide asset management planning in the Township. These principles align with the principles in section 3 of the *Infrastructure for Jobs and Prosperity Act, 2015*.

1. **Forward Looking** – the Township shall take a long-term perspective while considering demographic and economic trends in the region.

2. **Budgeting and Planning** – the Township shall take into account any applicable budgets or fiscal plans such as budgets adopted under Part VII of the *Municipal Act, 2001*.

3. **Consistency** – the Township shall ensure the continued provision of core public services such as protection, transportation, and environmental services.

4. **Economic Development** – the Township shall promote economic competitiveness, productivity, job creation, and training opportunities.

5. **Prioritization** – the Township shall clearly identify infrastructure priorities that will drive investment decisions.

6. **Innovation** – the Township shall create opportunities to make use of innovative technologies, services, and practices, particularly where doing so would utilize technology, techniques, and practices developed in Ontario.

7. **Transparency** – the Township shall be evidence-based and transparent. Additionally, subject to any prohibitions under an Act or otherwise by law on the collection, use, or disclosure of information, the Township shall:

a) make decisions with respect to infrastructure based on information that is publicly available or made available to the public; and
b) share information with implications on infrastructure and investment decisions with the Government and broader public sector entities.

8. **Environmental Consciousness** – the Township shall minimize the impact of infrastructure on the environment by:

   a) respecting and helping maintain ecological and biological diversity;
   b) augmenting resilience to the effects of climate change; and
   c) endeavoring to make use of acceptable recycled aggregates.

9. **Health and Safety** – the Township shall ensure that the health and safety of workers involved in the construction and maintenance of infrastructure assets is protected.

10. **Community Focused** – the Township shall promote community benefits, being the supplementary social and economic benefits arising from an infrastructure project that are intended to improve the well-being of the community, such as:

    a) local job creation and training opportunities (including for apprentices, within the meaning of section 9 of the *Infrastructure for Jobs and Prosperity Act, 2015*);
    b) improvement of public space within the community; and
    c) promoting accessibility for persons with disabilities.

11. **Integration** – in planning and making decisions surrounding infrastructure, where relevant and appropriate, the Township shall be mindful and consider the principles and content of non-binding provincial or municipal plans and strategies established under an Act or otherwise.

Governance

The CAO/Clerk has overall responsibility for asset management planning for the Township. The CAO/Clerk is responsible for:

- Delegating asset management-related tasks to Township staff within their defined job descriptions or competencies, and for recruiting external assistance when the required expertise does not reside in-house. Staff involved might include the Treasurer, Deputy Clerk, Roads Supervisor, and Administrative Assistant.
- Arranging meetings among staff members to ensure timelines for strategic asset management policy review, asset management plan development and review, and provincial reporting requirements are adhered to.
- Ensuring municipal ratepayers and other interested parties are given opportunities to provide input into asset management planning.
- Approving the Asset Management Plan before being presented to Council for approval.
- By July 1, 2025, preparing an annual report relating to the Township's asset management progress for Council consideration. The report will address:

  -the Township's progress in implementing its *Asset Management Plan*;

-any factors impeding the implementation of the *Asset Management Plan*; and
-proposed strategies to address identified impediments.

As part of the annual budgeting process, The CAO/Clerk will review the asset management principles with Council, staff members, and the public, provide them with a summary of the asset management planning milestones to be achieved in the budget year, and report on the asset management planning progress made to date.

Council has a key role in ensuring the long-term sustainability and resilience of the Township's infrastructure. Following are some of Council's roles and responsibilities with respect to asset management planning in the Township:

- Reviewing and approving by resolution the Strategic Asset Management Policy and all subsequent revisions within their term of Council.
- Reviewing and approving by resolution revisions to the Asset Management Plan.
- Annually reviewing and approving the report on the Township's asset management progress prepared by the CAO/Clerk
- Adhering to the asset management planning guiding principles when making budget and other planning decisions.
- Ensuring tax rate and other revenue generating decisions move the Township towards sustainability and resilience.

Strategic Alignment

Official Plan, Economic Development Plan, and Related Policies

Well-maintained infrastructure is important to the growth and development of the Township as set out in the goals of the Township's *Official Plan.* The *Official Plan* encourages the improvement of infrastructure to better service the existing population, while noting that significant expansion of municipal infrastructure is not anticipated.

Maintenance and improvement of infrastructure, particularly in areas related to internet and serviced land development, is also deemed critical in the Township's *Regional Economic Development Strategic Plan.*

It is the intent of both the *Official Plan* and *Regional Economic Development Strategic Plan* to encourage development that is compatible with the character, role, and permitted uses of agricultural, rural, and Township site areas, as well as to promote the continued functioning of natural systems. It is the intent that the natural beauty and environmental resources, considered key factors in the growth of the tourism sector, are not damaged by future development.

Good roads and bridges facilitate the movement of goods, the provision of services (notably emergency services), and the transport of people to work, school, recreation, and other facilities. Good roads are essential to attracting economic development in the transport of commodities to market and providing access to tourism and other amenities the Township has to offer.

The state of local infrastructure also reflects on the image of the Township to its residents and visitors. Poorly maintained infrastructure conjures a negative image and may detract from investment in the Township.

Consequently, the Township's *Asset Management Plan* facilitates the achievement of the vision outlined in the Township's *Official Plan* and *Regional Economic Development Strategic Plan* and supports the execution of the Township's *Emergency Management Response Plan*.

The Township's *Accessibility Plan* provides a mission to "provide quality programs and services that are accessible to all persons served by the Municipality". This aligns with the asset management principles that will guide asset management planning in the Township.

Annual Budgets

The *Asset Management Plan* will be considered annually in the Township's operating budgets, capital budgets, and long-range financial plans as well as in the development of tax levy rates and other related revenue generators. A review of the financing section of the *Asset Management Plan* will be included in the annual budget deliberations.

The *Asset Management Plan* will be referenced by the service area personnel, in conjunction with the Treasurer, in the preparation of their budgets to help them:

1. Identify all potential revenues and costs (including operating, maintenance, replacement, and decommissioning) associated with proposed infrastructure investments;
2. Evaluate the validity and need for proposed capital investments; and
3. Incorporate new revenue tools and alternative funding strategies where possible.

Stakeholder Engagement

The Township is committed to providing opportunities for municipal ratepayers and other interested parties to provide input into asset management planning. Stakeholders are encouraged to attend public budget meetings and comment on asset management-related decisions being considered by Council. They will also be encouraged to comment on any revisions to the Township's existing *Asset Management Plan* prior to adoption by Council.

The Township recognizes that neighboring municipalities, provincial agencies, and other infrastructure-asset-owning agencies such as regulated utilities are partners in the delivery of service for municipal ratepayers. Accordingly, the Township shall coordinate asset management planning with these external parties when appropriate.

Asset Management Plan

With the exception of land, all assets meeting the single asset capitalization thresholds detailed in the Township's *Tangible Capital Asset By-Law* will be included in the *Asset Management Plan*. This includes the Township's proportionate share of the assets of any shared or fully-controlled services. Pooled assets—assets that are capitalized under the Township`s tangible capital asset by-law but do not meet the single asset capitalization threshold—will be excluded from the *Asset*

Management Plan. The low capitalization thresholds established by the tangible capital asset by-law ensures that all assets whose role in service delivery requires deliberate management by the Township are included in the *Asset Management Plan*.

On an ongoing basis, the planning department reviews all proposed development to ensure that it complies with the intent and direction of the *Official Plan* and *Zoning By-Law*. The planning department reviews Ontario's land-use planning framework, including any relevant policy statements issued under section 3(1) of the Planning Act, to ensure that provincial plans are incorporated into updates of the Township's *Official Plan* and *Zoning By-Law*. Prior to the adoption of any revisions to the *Asset Management Plan*, the planning department will review the plan to ensure that it is aligned with the *Official Plan* and, consequently, to Ontario's land use planning framework, policy statements, and plans.

The Township **commits** to consider in asset management planning:

a) the ***actions*** that may be required to address the risks and vulnerabilities that may be caused by climate change to the Township's infrastructure assets (including changing operating procedures (e.g., revising maintenance schedules), raising/lowering levels of service and lifecycle management strategies) as well as the ***anticipated costs*** that could arise from these impacts, and ***adaptation opportunities*** that may be undertaken to manage the potential risks;

b) mitigation approaches to climate change, such as greenhouse gas emission reduction; and

c) disaster planning and any required contingency funding.

Continuous Improvement

As part of the annual budgeting process, the CAO/Clerk will provide Council, department managers, and the public with an update on asset management planning progress. This will include any factors affecting the ability of the Township to meet its commitments as set out in the Asset Management Plan and Strategic Asset Management Policy, a strategy to address those factors, and progress on ongoing efforts to implement the Asset Management Plan.

The Asset Management Plan will be subject to revision as the Township works within its constraints and identifies specific challenges and/or opportunities for improvement. A comprehensive review of the plan shall be undertaken every five years, as a minimum, or on an as-required basis. Review of the plan will include an update to the existing state and condition of infrastructure inventory through such activities as the regular OSIM (Ontario Structural Inspection Manual) reporting and road evaluations. It will also include an update of the proposed levels of service, the lifecycle management strategy required to maintain the proposed level of service, an updated financial strategy, and a discussion of how the Township intends to address any funding shortfalls.