# Asset Management Plan

## Township of Algonquin Highlands

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# List of Acronyms and Abbreviations

| | |
|---|---|
| CL | Centreline |
| BCI | Bridge Condition Index |
| CSP | Corrugated Steel Pipe |
| G/S | Gravel |
| HCB | High-Class Bituminous |
| HVAC | Heating, Ventilation, and Air Conditioning |
| IJPA | Infrastructure for Jobs and Prosperity Act |
| LCB | Low-Class Bituminous |
| MMS | Minimum Maintenance Standards |
| OCIF | Ontario Community Infrastructure Fund |
| OSIM | Ontario Structure Inspection Manual |

# Report

# Chapter 1
# Introduction

# 1. Introduction

## 1.1 Overview

The main objective of an asset management plan is to use a municipality's best available information to develop a comprehensive long-term plan for capital assets. In addition, the plan should provide a sufficiently documented framework that will enable continuous improvement and updates of the plan, to ensure its relevancy over the long term.

Watson & Associates Economists Ltd. (Watson) was retained by the Township of Algonquin Highlands (Township) to prepare a comprehensive asset management plan. Watson completed the asset management plan in partnership with Dillon Consulting Limited (Dillon), who completed a visual assessment of the functional and physical conditions of the Township's road network and facilities. One of the objectives of this plan is to move the Township's asset management practices towards compliance with Ontario Regulation 588/17. It is intended to be a tool for municipal staff and Council to use during various decision-making processes, including the annual budgeting process and future capital grant application processes.

The asset management plan is intended to cover all physical assets managed by the Township. These assets can be broadly grouped into the following categories:

- Roads;
- Bridges and culverts;
- Facilities;
- Vehicles; and
- Equipment.

The Township's goals and objectives with respect to asset management are identified in the Township's Strategic Asset Management Policy. A major theme within that policy is for the Township's physical assets to be managed in a manner that will support the sustainable provision of municipal services to residents. Through the implementation of the asset management plan, the Township's practice should evolve to provide services at levels proposed within this document. Moreover, infrastructure and other capital assets should be maintained at condition levels that provide a safe and functional

environment for the Township's residents. Therefore, the asset management plan and the progress with respect to its implementation will be evaluated based on the Township's ability to meet these goals and objectives.

## 1.2 Legislative Context for the Asset Management Plan

Asset management planning in Ontario has evolved significantly over the past decade.

Before 2009, capital assets were recorded by municipalities as expenditures in the year of acquisition or construction. The long-term issue with this approach was the lack of a capital asset inventory, both in the municipality's accounting system and financial statements. As a result of revisions to section 3150 of the Public Sector Accounting Board handbook, effective for the 2009 fiscal year, municipalities were required to capitalize tangible capital assets, thus creating an inventory of assets.

In 2012, the Province launched the municipal Infrastructure Strategy. As part of that initiative, municipalities and local service boards seeking provincial funding were required to demonstrate how any proposed project fits within a detailed asset management plan. In addition, asset management plans encompassing all municipal assets needed to be prepared by the end of 2016 to meet Federal Gas Tax agreement requirements. To help define the components of an asset management plan, the Province produced a document entitled Building Together: Guide for Municipal Asset Management Plans. This guide documented the components, information, and analysis that were required to be included in municipal asset management plans under this initiative.

The Province's *Infrastructure for Jobs and Prosperity Act, 2015* (IJPA) was proclaimed on May 1, 2016. This legislation detailed principles for evidence-based and sustainable long-term infrastructure planning. IJPA also gave the Province the authority to guide municipal asset management planning by way of regulation. In late 2017, the Province introduced O. Reg. 588/17 under IJPA. The intent of O. Reg. 588/17 is to establish standard content for municipal asset management plans. Specifically, the regulations require that asset management plans be developed that define the current and proposed levels of service, identify the lifecycle activities that would be undertaken to achieve these levels of service, and provide a financial strategy to support the levels of service and lifecycle activities.

This plan has been developed as a first step towards addressing the requirements of O. Reg. 588/17. It utilizes the best information available to the Township at this time.

## 1.3 Asset Management Plan Development

This asset management plan was developed using a program that leverages the Township's asset management principles as identified within its strategic asset management policy, capital asset database information, and staff input.

The development of the Township's asset management plan is based on the steps summarized below:

1. Compile available information pertaining to the Township's capital assets to be included in the plan, including attributes such as size, material type, useful life, age, accounting valuation and current valuation. Update current valuation, where required, using benchmark costing data or applicable inflationary indices.

2. Define and assess current asset conditions, based on a combination of field work performed by Dillon, Township staff input, existing asset reports, and an asset age-based condition analysis.

3. Define and document current levels of service based on analysis of available data and consideration of various background reports.

4. Develop an asset management strategy that identifies the activities required to sustain the levels of service discussed above. The strategy summarizes these activities in the forecast of annual capital and operating expenditures required to achieve these level of service outcomes.

5. Develop a financing strategy to support the lifecycle management strategy. The financing plan informs how the capital and operating expenses arising from the asset management strategy will be funded over the forecast period.

6. Document the comprehensive asset management plan in a formal report to inform future decision-making and to communicate planning to municipal stakeholders.

## 1.4 Maintaining and Integrating the Asset Management Plan

The asset management plan should be updated as the strategic priorities and capital needs of the Township change. This can be accomplished in conjunction with specific legislative requirements (i.e. 5-year review of asset management plan under IJPA), as well as the Township's annual budget process. Further integration into other municipal financial and planning documents would assist in ensuring the ongoing accuracy of the asset management plan, as well as the integrated financial and planning documents. The asset management plan has been developed to allow linkages to several strategic documents, as identified in the Township's Strategic Asset Management Policy.

When updating the asset management plan, it should be noted that the state of local infrastructure, lifecycle management strategy and financing strategy are integrated and impact each other. For example, the financing strategy outlines how the asset management strategy will be funded. The lifecycle management strategy illustrates the costs required to maintain expected levels of service at a sustainable level.

# Chapter 2
# State of Local Infrastructure and Levels of Service

# 2. State of Local Infrastructure and Levels of Service

## 2.1 Introduction

This chapter provides an analysis of the Township's assets and the current service levels provided by those assets.

O. Reg. 588/17 requires that for each asset category included in the asset management plan, the following information must be identified:

- Summary of the assets;
- Replacement cost of the assets;
- Average age of the assets (it is noted that the Regulation specifically requires average age to be determined by assessing the age of asset components);
- Information available on condition of assets; and
- Approach to condition assessments (based on recognized and generally accepted good engineering practices where appropriate).

Asset management plans must identify the current levels of service being provided for each asset category. For core municipal infrastructure assets, both the qualitative descriptions pertaining to community levels of service and metrics pertaining to technical levels of service are prescribed by O. Reg. 588/17. For all other infrastructure assets, each municipality will need to establish its own measures for levels of service.

Asset management plans must also include a 10-year forecast identifying the proposed levels of service for each asset category. The proposed levels of service will be defined using the qualitative descriptions and technical metrics that the municipality uses to define current levels of service.

The rest of this chapter addresses the requirements identified above, with each section focusing on an individual asset category.

## 2.2 Roads

### *2.2.1 State of Local Infrastructure*

The Township currently owns and manages 111 centreline kilometres of road assets. The road network consists of roads with various surface types, including high-class bituminous (HCB), low-class bituminous (LCB), and gravel (G/S). Only Mutual Road has an HCB surface and the Township's intention is to replace it with an LCB surface when it reaches the end of its useful life. The 2020 replacement value of the road network is approximately $34.5 million. The replacement value has been estimated based on replacement cost of $40 per square metre for gravel roads and $50 per square metre for LCB roads. Mutual Road was costed as an LCB road because that is its planned surface type in the future. Table 2-1 provides a breakdown of the road network by surface type. Figure 2-1 illustrates this breakdown as a proportion of the total.

Over two thirds of the road network length (68%) is LCB. Almost all the remaining roads are gravel – 32% of the total road network length. Mutual Road, the only HCB road, has a length of 273 metres. This represents 0.2% of the total road network length.

Table 2-1
Road Network – Surface Type

| Surface Type | Centreline-kilometres | Replacement Cost (2020$) |
|---|---|---|
| HCB | 0.3 | $93,200* |
| LCB - Major | 61.3 | $20,178,200 |
| LCB - Minor | 13.4 | $4,201,300 |
| Gravel | 35.7 | $9,998,900 |
| **Total** | **110.7** | **$34,471,700** |

*Replacement cost based on LCB construction cost

Figure 2-1
Road Network Distribution – Surface Type
Based on Centreline-kilometres

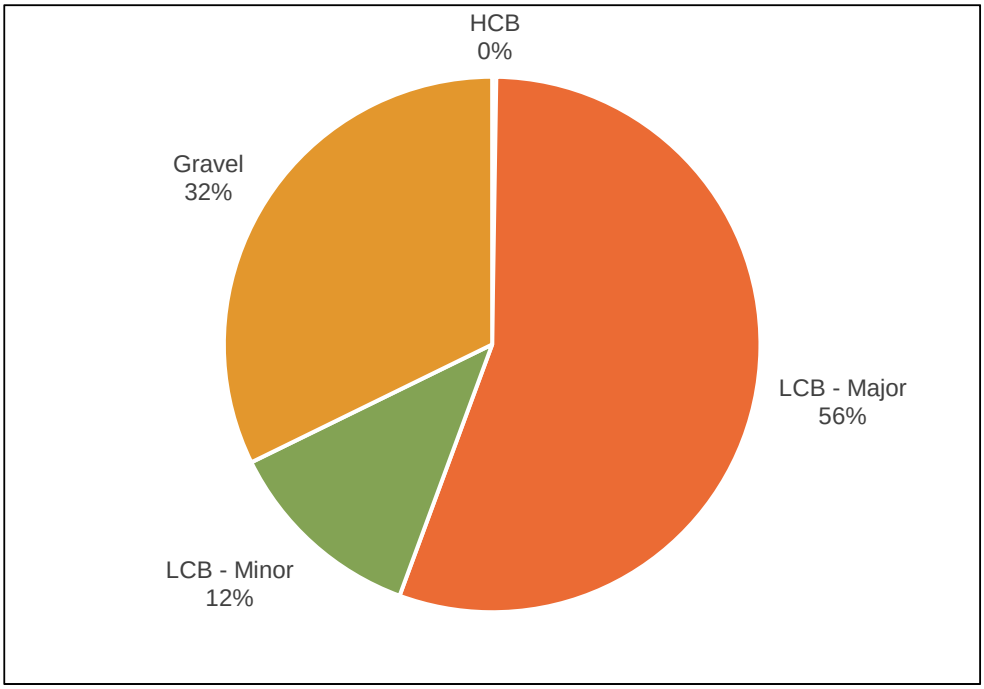
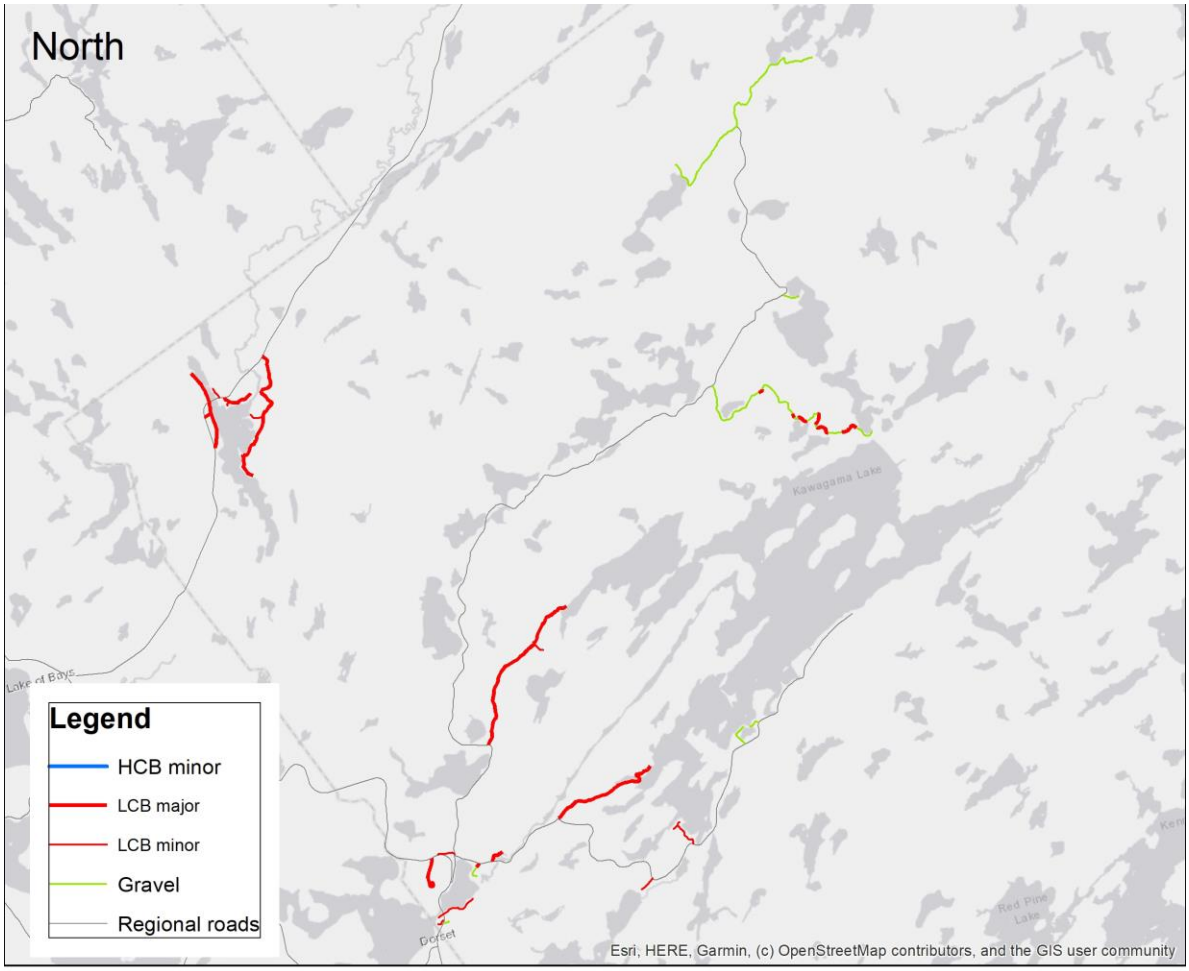
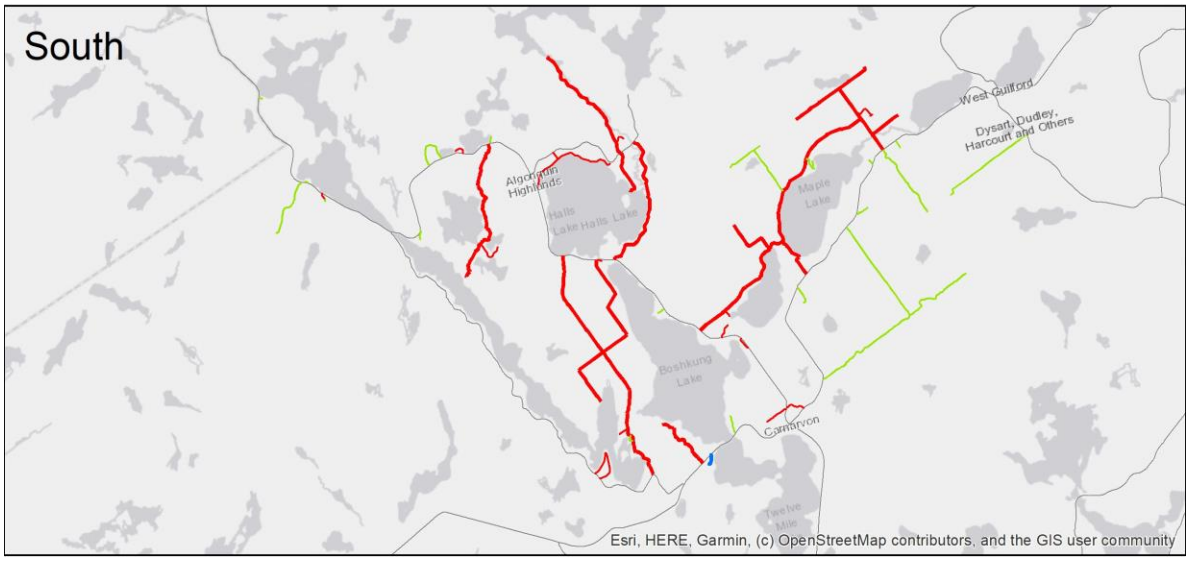



Figure 2-2 maps the road network by surface type to visualize the extent and characteristics of the Township's road assets. A distinction is made between major and minor hard-top roads, based on a staff assessment of the wear and tear that is expected on the road, with major roads expected to require more frequent reconstruction than minor roads.

Figure 2-2
Map – Roads by Surface type



### 2.2.2 Condition

Dillon assessed the condition of the Township's roads in 2019. Paved roads were assessed using the Pavement Condition Index (PCI) measure as defined by ASTM. Gravel and dirt roads were assessed using a simpler methodology applicable to them. Both measures provide a numerical assessment of road condition ranging from 0 to 100. The greater the rating, the greater the condition of the road. Additional details on the assessment methodology used by Dillon can be found in Appendix A

To better communicate the condition of the road network, these numeric condition ratings have been segmented into qualitative condition states. Moreover, photographic illustrations of these condition states are provided to better communicate the condition to the reader. Table 2-2 summarizes the various physical condition ratings and the condition state they represent for road assets.

Table 2-2
Road Condition States Defined with Respect to Condition

| Pavement Condition Index (PCI) Range | Condition State | Example Photo |
|---|---|---|
| 85 < PCI ≤ 100 | **Excellent** | |
| 70 < PCI ≤ 85 | **Very Good** |  |
| 55 < PCI ≤ 70 | **Good** |  |

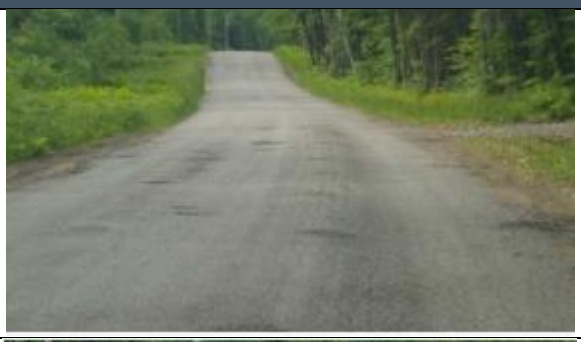
| Pavement Condition Index (PCI) Range | Condition State | Example Photo |
|---|---|---|
| 40 < PCI ≤ 55 | **Fair** |  |
| 25 < PCI ≤ 40 | **Poor** |  |
| 10 < PCI ≤ 25 | **Very Poor** |  |
| 0 ≤ PCI ≤ 10 | **End of Life** |  |

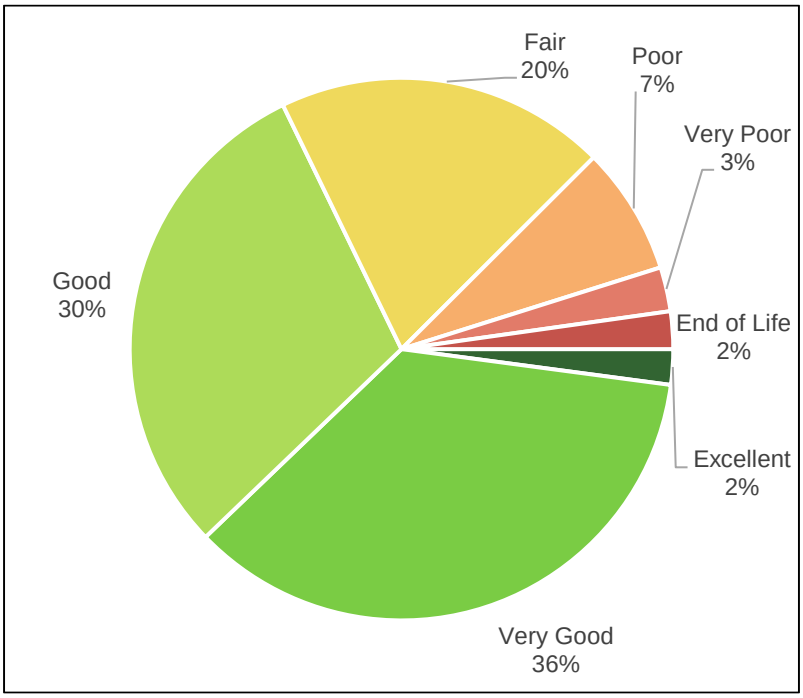
Table 2-3 presents the average condition of the road network by surface type, which is weighted based on centreline kilometres. Adjustments to the condition index should be performed annually based on the lifecycle degradation profiles developed in this asset management plan or set to known values when capital improvements are completed (i.e. rehabilitation or replacement activities being performed). The condition ratings used in this plan are from 2019.

As illustrated in Table 2-3, the Township's one HCB road is in a Poor condition, LCB roads are in a Good condition and gravel roads are in a Fair condition, on average. Assessed across the entire road network, the average pavement condition index rating is 61.2, or currently in the Good condition state. Figure 2-3 shows the overall distribution of road length by condition state for the Township.

Table 2-3
Road Condition Analysis

| Road Surface | Centreline-kilometres | Pavement Condition Index (Weighted Average) | Average Condition State |
|---|---|---|---|
| HCB | 0.3 | 30.3 | Poor |
| LCB - Major | 61.3 | 66.1 | Good |
| LCB - Minor | 13.4 | 58.5 | Good |
| Gravel | 35.7 | 54.0 | Fair |
| **Total** | **110.7** | **61.2** | **Good** |

Figure 2-3
Distribution of Road Condition




### *2.2.3 Current Levels of Service*

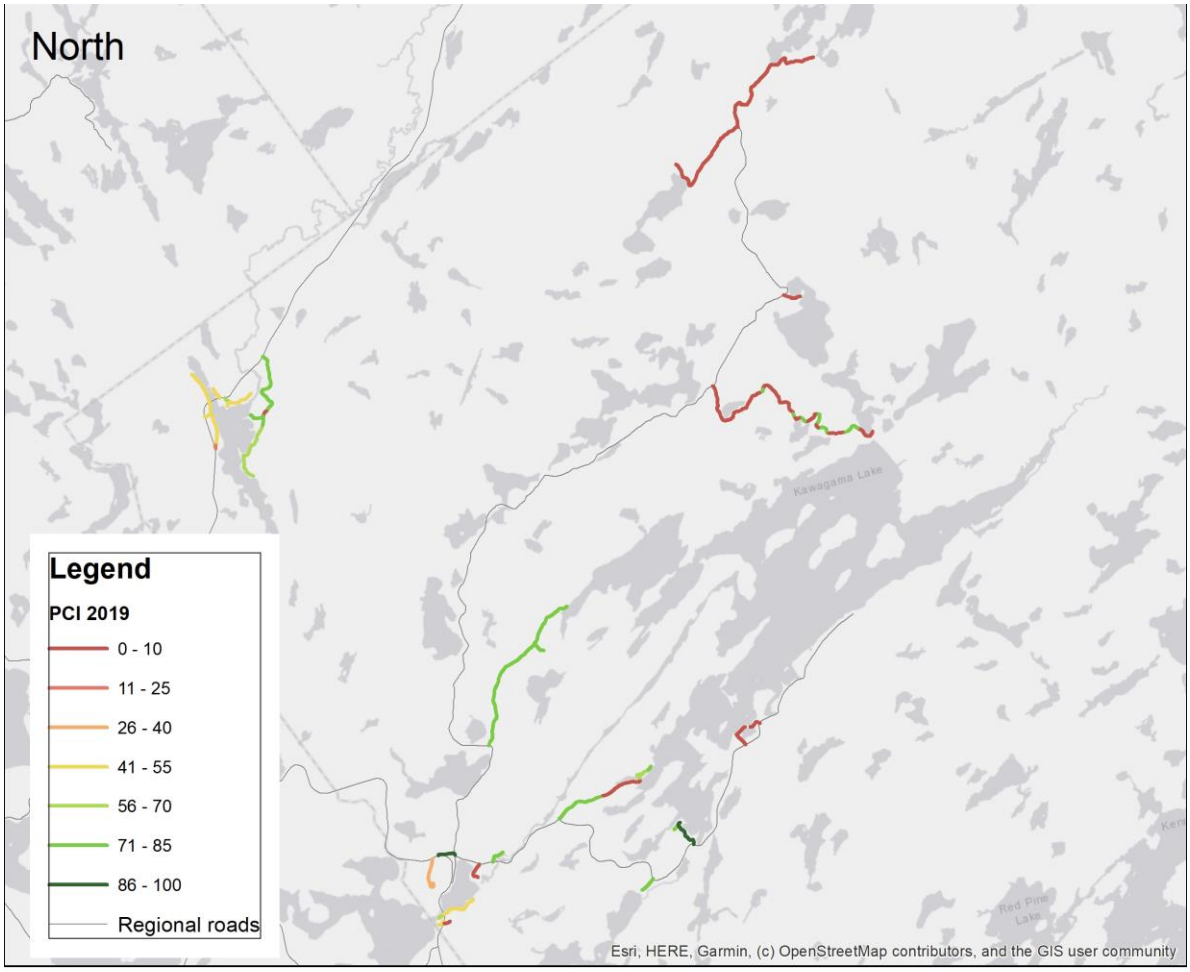
The levels of service currently provided by the Township's road network are, in part, a result of the state of local infrastructure identified above. A levels of service analysis defines the current levels of service and enables the Township to periodically evaluate service level outcomes and objectives.

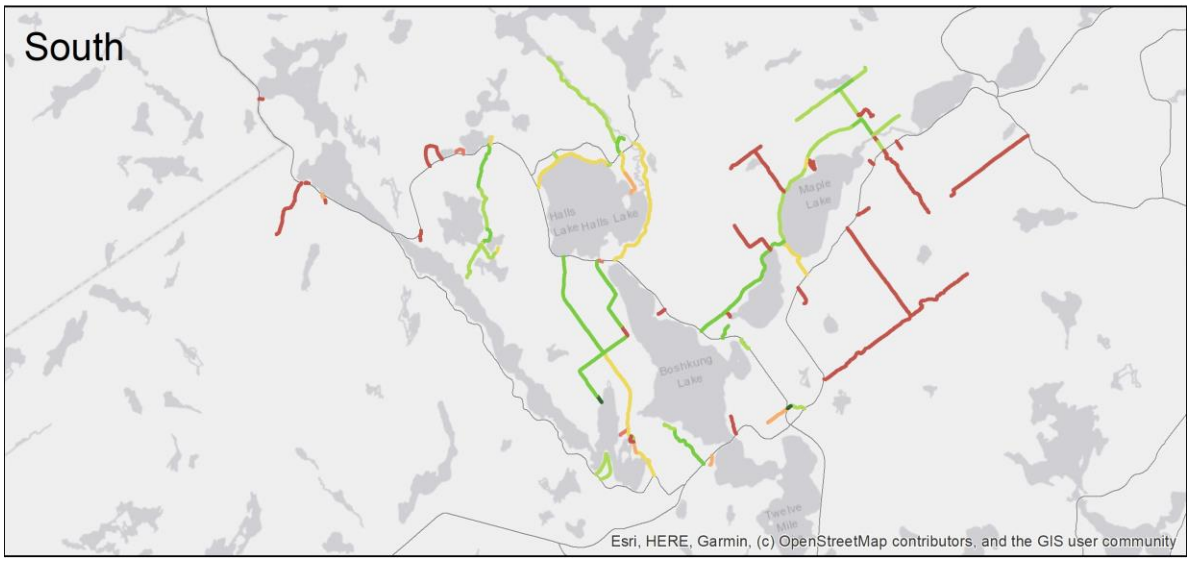
Road assets have prescribed levels of service reporting requirements under O. Reg. 588/17. These requirements include levels of service reporting from two different levels, i.e. community levels of service and technical levels of service. Community levels of service objectives describe service levels in terms that customers understand and reflect their scope and quality expectations of the road network. Technical levels of service describe the scope and quality of Township roads through performance measures that can be quantified, evaluated, and detail how effectively a municipality provides services. Table 2-4 presents the current levels of service measures as mandated by O. Reg. 588/17.

Table 2-4
Roads Current Levels of Service – O. Reg. 588/17

| Levels of Service Category | Service Attribute | Current Levels of Service |
|---|---|---|
| Community Levels of Service | Scope | Figure 2-2 depicts the Township's road network, by surface type |
| | Quality | Table 2-2 details how road Pavement Condition Index is assigned into qualitative condition states |
| Technical Levels of Service | Scope | Lane-km per square km of land<br>Arterial: 0<br>Collector: 0<br>Local: 0.11 |
| | Quality | Table 2-3 summarizes the average Pavement Condition Index of the Township's road network |

Figure 2-4
Map – Roads by Condition



Along with average PCI, the Township intends to report the centreline lengths of HCB and LCB roads with a PCI less than 50. While the average PCI summarizes the condition of all roads in a single number, it does not clearly identify how much of the road network is falling below minimum desired PCI levels, in this case a PCI of 50. Table 2-5 reports the current centreline-kilometres of HCB and LCB road with a PCI below 50.

Table 2-5
Centreline-kilometres of Roads With PCI Less Than 50

| Road Surface | Centreline-kilometres | Per cent of total Centreline-kilometers |
|---|---|---|
| HCB | 0.3 | 100.0% |
| LCB - Major | 7.8 | 12.7% |
| LCB - Minor | 4.3 | 31.7% |
| **Total** | **12.3** | **16.4%** |

### *2.2.4 Proposed Levels of Service*

The Township is taking a prudent approach to choosing proposed levels of service for roads. Table 2-6 presents proposed levels of service for the measures reported in the previous section. The proposed level of service for HCB and LCB roads – maintaining an overall average condition state of Good (i.e. PCI between 55 and 70) – is currently being satisfied. Gravel roads currently have an average condition of 54, just below the target condition state of Good (Condition between 55 and 70). There is more work to be done to eliminate the 12.3 centerline-kilometres of roads with a PCI below 50. If the lifecycle management strategy presented in section 3.2 is followed, it is expected that this backlog will be eliminated over time.

Table 2-6
Proposed Levels of Service for Roads

| Measure | Target |
|---|---|
| Average PCI for HCB and LCB roads | Good (PCI 55 - 70) |
| Average condition for gravel roads | Good (Condition 55 - 70) |
| Centreline-kilometres of HCB and LCB roads with PCI below 50 | 0 km |

## 2.3 Bridges and Structural Culverts

### *2.3.1 State of Local Infrastructure*

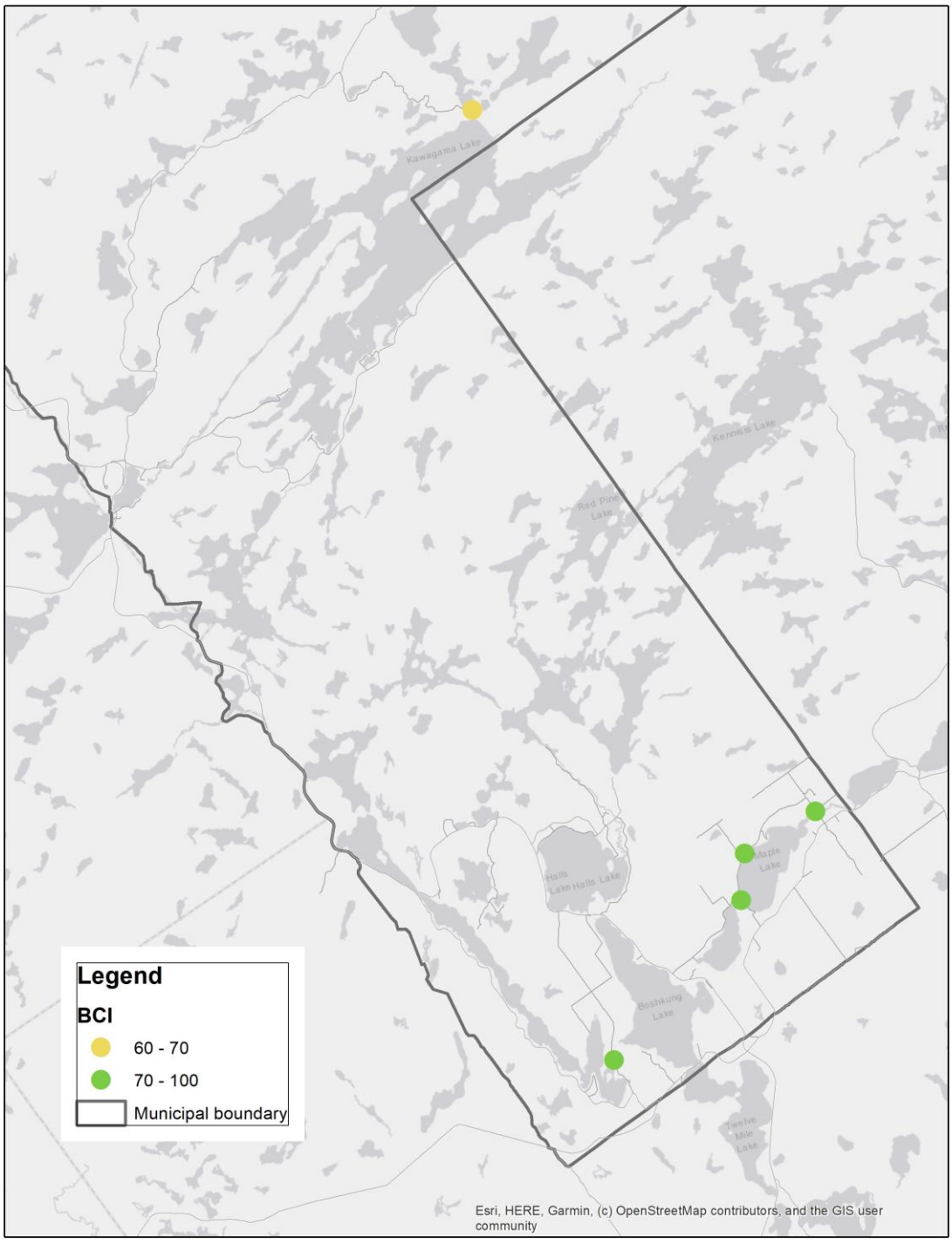
The Township currently owns and manages four bridges and one major culvert, with a 2020 replacement value totaling approximately $3.89 million. The weighted average age of these assets is 40 years.

Table 2-7
Bridge and Culvert Infrastructure Summary

| Type | Quantity | Average Age | Replacement Cost (2020$) |
|---|---|---|---|
| Bridges | 4 | 41.1 | $3,777,904 |
| Culverts | 1 | 5.0 | $115,558 |
| **Total** | **5** | **40.0** | **$3,893,462** |

Figure 2-5 maps the bridge and culvert network to visualize the Township's current circumstances.

Figure 2-5
Map – Bridges and Culverts



### 2.3.2 Condition

The Township's 2018 OSIM report assessed the condition of the bridge and culvert network, assigning a Bridge Condition Index (BCI) to each asset. A BCI score is provided on a numeric scale of 0-100 and is a measure of the overall condition of the structure based on an evaluation of individual components.

Similar to road assets, to better communicate the condition of the bridge and culvert network, the numeric condition ratings have been segmented into qualitative condition states as summarized in Table 2-8. It is noted that there are no photos of structures in a Poor condition because none of the Township's structures are currently in that condition state.

Table 2-8
Bridge and Culvert Condition States Defined with Respect to BCI

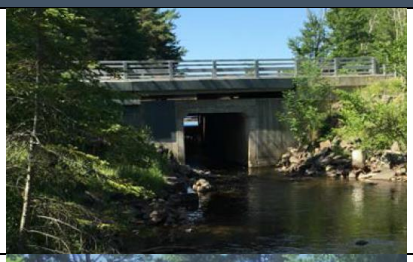
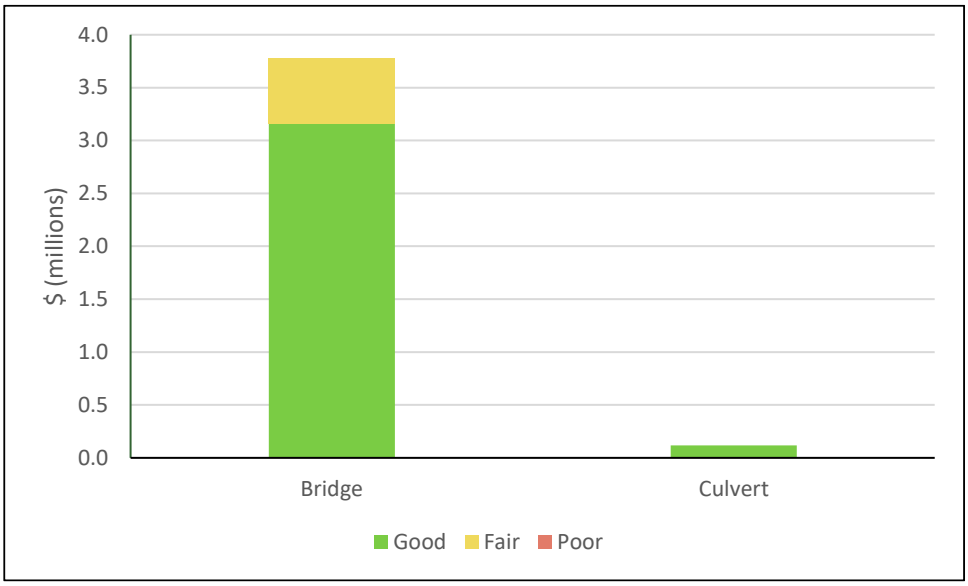
| Bridge Condition Index (BCI) | Condition State | Example Photo |
|---|---|---|
| 100 ≥ BCI > 70 | **Good** |  |
| 70 ≥ BCI > 60 | **Fair** |  |
| 60 ≥ BCI > 0 | **Poor** | No Photo Available |

Table 2-9 examines the average condition rating of the bridge and culvert network. The condition of the structures comes from the Township's 2018 OSIM report. No bridges have a BCI of 40 or below, the condition at which they are assumed to require replacement. Figure 2-6 shows the breakdown of replacement value by condition rating for bridges and culverts.

Table 2-9
Bridge and Culvert Condition Analysis

| Type | Quantity | Average BCI | Minimum Observed BCI | Average Condition State |
|---|---|---|---|---|
| Bridges | 4 | 71.4 | 65.1 | Good |
| Culverts | 1 | 95.4 | 95.4 | Good |
| **Total** | **5** | **72.2** | **65.1** | **Good** |

Figure 2-6
Bridge and Culvert Condition Analysis




### *2.3.3 Current Levels of Service*

The level of service currently provided by the Township's bridge and culvert network is, in part, a result of the state of local infrastructure identified above. A levels of service analysis defines the current levels of service and enables the Township to periodically evaluate these service level objectives.

Bridge and culvert assets have prescribed levels of service reporting requirements under O. Reg. 588/17. Similar to roads, these requirements include levels of service reporting from two different levels, i.e. community levels of service and technical levels of service. Community levels of service objectives describe service levels in terms that customers understand and reflect their scope and quality expectations of the bridge and culvert network. Technical levels of service describe the scope and quality of Township

bridges and culverts through performance measures that can be quantified, evaluated, and detail how effectively a municipality provides services. Table 2-10 presents the current levels of service as mandated by O. Reg. 588/17.

Table 2-10
Bridge's and Culvert's Current Levels of Service – O. Reg. 588/17

| Levels of Service Category | Service Attribute | Current Levels of Service |
|---|---|---|
| Community Levels of Service | Scope | Bridges and culverts are utilized by passenger vehicles, emergency vehicles, pedestrians, cyclists, and heavy transport vehicles |
| | Quality | Table 2-8 details how BCI is segregated into qualitative condition states |
| Technical Levels of Service | Scope | One of the Township's bridges currently has load restrictions. It is noted, however, that this is a design limitation, not a result of the structure's condition. No bridges have dimensional restrictions. |
| | Quality | Table 2-9 summarizes the average condition of the Township's bridge and culvert network |

The Township proposes to report the number of bridges rated as Poor (BCI < 60), as an additional level of service measure. This will help identify how many of the Township's bridges may require significant rehabilitation or replacement in the near-term. There are currently no bridges rated Poor.

### *2.3.4 Proposed levels of Service*

The Township is taking a prudent approach to choosing proposed levels of service for bridges and culverts. The Township proposes targeting an average BCI that is no lower than 70, the bottom of the Good rating, and no bridges being in a condition rating of Poor. Both of these targets are currently being met.

## 2.4 Facilities

### 2.4.1 State of Local Infrastructure

The Township currently manages several facilities, comprising 108 individual buildings, structures, and related assets. The combined replacement value of all facilities is $19.6 million. Facility assets range in value from Fire Hall Number 80 with a replacement value just over $1 million to assets with replacement values of a few thousand dollars such as gazebos and vault toilets. Table 2-11 breaks down facility asset counts and replacement costs by department.

Table 2-11
Facilities Counts and Replacement Costs by Department

| Department | Count | Replacement Value |
|---|---|---|
| Administration | 2 | $1,119,400 |
| Airport | 13 | $6,550,994 |
| Fire | 5 | $2,455,700 |
| Parks, Recreation and Trails | 66 | $7,122,325 |
| Roads | 5 | $2,178,800 |
| Waste Management | 16 | $110,100 |
| Policing | 1 | $88,400 |
| **Total** | **108** | **$19,625,719** |

### 2.4.2 Condition

Dillon assessed the condition of 61 of the 108 facility assets covered in this plan. Through discussions with Township staff, condition ratings were assigned to another 8 facility assets without undergoing a detailed inspection. This brings the number of facility assets with condition ratings to 69. The assessed assets have a replacement value of $17.2 million, 88% of total replacement cost. Appendix A describes the methodology employed by Dillon in undertaking the condition assessments. Table 2-12 expands on Table 2-11, further breaking down the results by condition assessment method.

Table 2-12
Facilities Counts and Replacement Costs by Assessment Level and Department

| Assessment level / Department | Count | Replacement Value |
|---|---|---|
| **Component** | **26** | **$12,067,200** |
| Administration | 1 | $837,500 |
| Airport | 7 | $3,598,900 |
| Fire | 3 | $2,444,200 |
| Parks, Recreation and Trails | 10 | $3,215,200 |
| Roads | 4 | $1,883,000 |
| Policing | 1 | $88,400 |
| **Docks & Landings** | **21** | **$1,417,000** |
| Parks, Recreation and Trails | 21 | $1,417,000 |
| **No Componentization** | **22** | **$3,741,925** |
| Airport | 3 | $1,489,200 |
| Parks, Recreation and Trails | 19 | $2,252,725 |
| **No Assessment** | **39** | **$2,399,594** |
| Administration | 1 | $281,900 |
| Airport | 3 | $1,462,894 |
| Fire | 2 | $11,500 |
| Parks, Recreation and Trails | 16 | $237,400 |
| Roads | 1 | $295,800 |
| Waste Management | 16 | $110,100 |
| **Total** | **108** | **$19,625,719** |

The 26 facility assets with component-level assessments done are significant buildings with individual replacement values of more than $40,000. Engineers specializing in architectural and mechanical building components completed the assessments. Docks and landings were assessed by an engineer specializing in marine infrastructure. The 14 assets that were assessed without looking at components were assessed as a whole because the assets are of simpler design than the 26 facilities that were inspected at the component level.

The overall average condition rating for all assessed facilities, weighted by replacement value, is 2.37. This is categorized as Good. Table 2-13 shows the average facility condition for departments with facility assets. For all departments except policing the average condition of facility assets is Good. For policing, the condition is Fair.

Table 2-13
Average Facility Condition by Department

| Department | Average Condition | Rating |
|---|---|---|
| Administration | 1.76 | Good |
| Airport | 2.30 | Good |
| Fire | 2.30 | Good |
| Parks, Recreation and Trails | 2.59 | Good |
| Roads | 2.12 | Good |
| Policing | 2.58 | Fair |
| **All** | **2.37** | **Good** |

While facility assets in each department are on average in Good or Fair condition, some individual components are in Poor and Very Poor condition. The total replacement cost of components in Poor or Very Poor condition is $1,453,461. Table 2-14 identifies components that are in Poor or Very Poor condition by facility and identifies the replacement costs.

Table 2-14
List of Components in Poor and Very Poor Condition with Replacement Cost

| Facility | Poor | Very Poor | Replacement Value |
|---|---|---|---|
| Bear Lake - public launch | Retaining wall (timber) | | $20,000 |
| Beech Lake - public launch | Dry hydrant | | $5,000 |
| Clinto Lake - public launch | | Retaining wall (timber) | $300,000 |
| Community Hall - Oxtongue Lake | | | $5,776 |
| Crozier Lake- public launch | Concrete launch, Access road (asphalt), Dry hydrant) | | $20,000 |
| Dorset Community Policing | Roofing | Air conditioning | $4,548 |
| Dorset Garage | Roofing, Windows, unit heaters | | $32,661 |
| Dorset Ice Palace - Change rooms for outside arena ice pad | Exterior doors | | $7,500 |
| Dorset Museum | Roofing | | $48,092 |
| Dorset Recreation Centre | Floors | | $15,484 |
| Dorset Tower – Gift Shop | Roofing | | $1,000 |
| Dorset Tower – Structure | | Paint, Structure repairs | $500,000 |
| Fire Hall - Number 60 | Furnace | | $8,000 |
| Fire Hall - Number 70 | Plumbing fixtures | | $2,000 |
| Fire Hall - Number 80 | Floors | | $42,900 |
| Fletcher Lake - public launch | Retaining wall (timber) | | $45,000 |
| Fletcher Landing - end of McClintock Rd. - public launch | Parking (asphalt and sand), dock (timber), gangway (timber) | | $59,000 |
| Halls Lake- public launch- concrete slab | Launch approach (asphalt) | | $1,500 |
| Hangar Building - near residence | Distribution panels | | $5,000 |
| Kawagama Lake - public launch | | Concrete launch | $90,000 |
| Little Hawk Lake - public launch | Concrete launch | | $10,000 |
| Otter Lake - Parker Landing - public launch | Launch approach (asphalt) | Access road (asphalt) | $23,000 |
| Raven Lake - public launch | Dock, Concrete launch, retaining wall (timber) | | $70,000 |
| Skin (Lower Fletcher) Lake - public launch | | Retaining wall (timber), landing (timber) | $95,000 |
| Terminal Building | Furnace | | $5,000 |
| Township Garage - Equipment Storage Building | Exterior doors, Plumbing fixtures, water treatment | | $37,000 |
| | | Total | $1,453,461 |

### 2.4.3 Current Levels of Service

In terms of levels of service, facilities require more detailed analysis than other asset classes because they are more complex, having many components. Furthermore, there is no single dimension over which to evaluate performance. Some problems, such as failure of a furnace in winter, can cause a facility to be closed until the issue is resolved. Other issues, such as loose carpeting that could be a tripping hazard, need to be addressed immediately to avoid injuries. If a roof leaks, it may not cause immediate problems, but could result in other facility components being damaged by water. Finally, some issues are merely cosmetic, such as stained ceiling tiles.

Making the link between asset condition and the impact of the condition on users is challenging. As a first step, the Township should leverage the condition assessment completed by Dillon to address the most pressing issues with facilities. To do this, the Township could focus on addressing assets with condition ratings of Poor and Very Poor because they are the issues that are most likely to cause problems identified in the previous paragraph. The Township could use the replacement value of facility components in Poor and Very Poor condition as a performance measure to track the performance of its facilities. The Township's current performance based on these measures are:

- Replacement value of facility components in Poor condition: $512,685
- Replacement value of facility components in Very Poor condition: $450,776

### 2.4.4 Proposed Levels of Service

Since it may take some time to address facility components that have been identified as being in Poor or Very Poor condition, the Township should take a cautious approach to setting targets for these performance measures. As a first step, the Township could plan to address all items with a condition rating of Very Poor and begin to reduce the replacement value of facility components in Poor condition.

## 2.5 Fleet

### 2.5.1 State of Local Infrastructure

The Township currently maintains a fleet of 40 vehicles. The vehicles range from tandem dump trucks with a current replacement value of about $380,000 per vehicle to

a utility vehicle with a replacement value of $12,500. The total replacement value of the Township's vehicles fleet is $6.2 million. The vehicles are divided between five departments, Public Works, Parks & Recreation, Fire, Airport, and Building. Table 2-15 shows fleet counts and replacement costs by broken down by department and fleet category.

Table 2-15
Counts and Replacement Costs for Fleet Assets

| Department/Category | Count | Replacement Value |
|---|---|---|
| **Fire** | **16** | **$3,163,800** |
| Frontline pumper | 4 | $1,475,000 |
| Remote access support | 4 | $69,150 |
| Rescue support | 4 | $754,800 |
| Tanker | 2 | $760,000 |
| Water access support | 2 | $104,850 |
| **Public works** | **16** | **$2,761,000** |
| Dump truck 5-ton or less | 2 | $170,000 |
| Dump truck 5-ton or more | 6 | $2,170,000 |
| Pickup truck | 8 | $421,000 |
| **Parks & Recreation** | **4** | **$192,000** |
| Pickup truck | 4 | $192,000 |
| **Parks & Recreation/Public Works** | **1** | **$12,500** |
| Utility vehicle | 1 | $12,500 |
| **Building Dept.** | **2** | **$50,000** |
| SUV | 2 | $50,000 |
| **Airport** | **1** | **$28,300** |
| Pickup truck | 1 | $28,300 |
| **Total** | **40** | **$6,207,600** |

### *2.5.2 Condition*

The condition of fleet assets is evaluated based on age. The age of an asset is compared to its expected Useful Life (UL). For this asset management plan, UL is defined as the average length of time in years that an asset is expected to be in service. The condition of an asset, then, is determined by comparing the asset's age to its UL. The comparison results in a percentage of expected useful life (UL %) that has been

consumed. A score of 0% represents a new asset. A score of 100% represents an asset at an age where it is typically replaced.

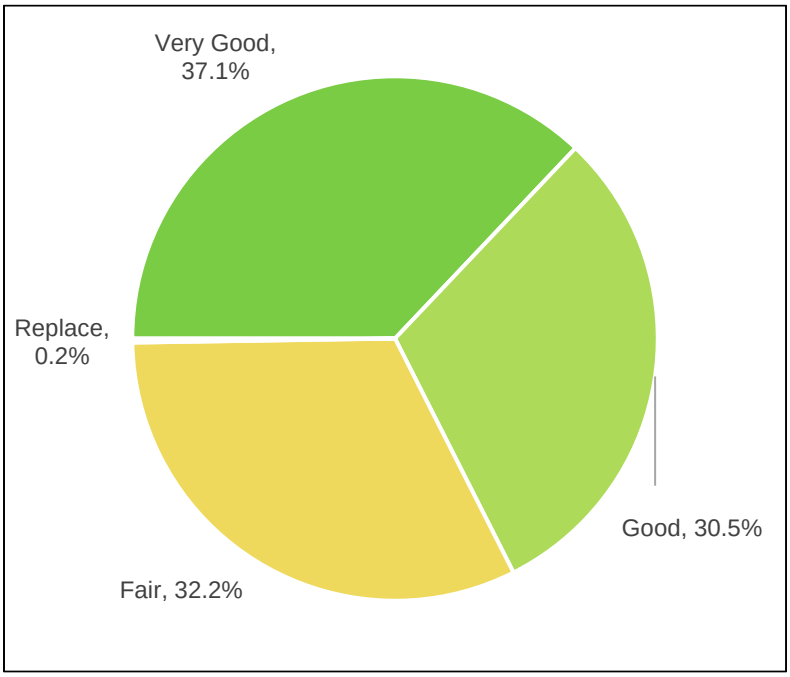
To better communicate the condition of the fleet assets, the UL % scores have been segmented into qualitative condition states as summarized in Table 2-16. The scale is set to show that if assets are replaced around the UL, they would likely have a rating of Fair. The rating of Fair extends to 140% of expected useful life. Beyond 140% of useful life, maintenance and repair costs required to keep the asset in a good state of repair are likely to have reached a point where it is more cost effective to replace the vehicle. Assets with a UL % > 140% are given a rating of Replace to indicate that it is likely more cost effective to replace the asset than to continue operating it. Vehicles rated Replace can have reliability issues, even with good maintenance, because more components are aging which increases the likelihood something will fail unexpectedly.

Table 2-16
Fleet Asset Condition States Defined with Respect to UL %

| UL % | Condition State |
|---|---|
| 0% ≤ UL % ≤ 45% | **Very Good** |
| 45% < UL % ≤ 90% | **Good** |
| 90% < UL % ≤ 140% | **Fair** |
| 140% < UL % | **Replace** |

Figure 2-7 presents the distribution of replacement value by condition rating for fleet assets. While the majority of assets (68%) have a condition of Very Good or Good, there are some older assets. Ten vehicles are in Fair condition, two in Public Works, seven in Fire, one in Parks & Recreation. One vehicle is rated Replace. It is an ATV in the Fire department. Assets rated Fair have a combined replacement value of $2.0 million, 32% of fleet replacement value. The ATV rated Replace has a replacement value of $15,300, 0.25% of fleet replacement value.

Figure 2-7
Fleet Asset Condition Distribution




### *2.5.3 Current Levels of Service*

The Township intends to manage its fleet to maintain functionality and minimize lifecycle costs. This is achieved primarily through regular inspection and maintenance work. By identifying and resolving issues, vehicles can be operated safely and reliably throughout their useful lives. The decision to replace a vehicle is driven mainly by rising maintenance and repair costs, and falling reliability.

To track how well the Township is keeping up with vehicle replacement, the percentage of fleet replacement value with an age-based condition rating of Replace will be reported. For this performance measure, lower is better. This is a lagging indicator in the sense that most vehicles will need to be replaced when they are in Fair condition because this category spans from 90% of expected useful life to 140% of expected useful life. The cut-off of 140% of expected useful life was chosen instead of 100% because some variation around the expected useful life can be expected based on how vehicles are used. The Township's current performance on this metric is 0.4%. That is, 0.4% of the fleet replacement value has a current rating of Replace.

### 2.5.4 Proposed Levels of Service

Given that the Township intends to manage its fleet to maintain functionality and minimize lifecycle costs, vehicles should be replaced near their expected useful lives. This means that it is reasonable to expect that only a relatively small number of vehicles will have a UL % greater than 140%. As a preliminary level of service target, the Township will seek to minimize the proportion of vehicles (based on replacement value) with an age-based condition rating of Replace.

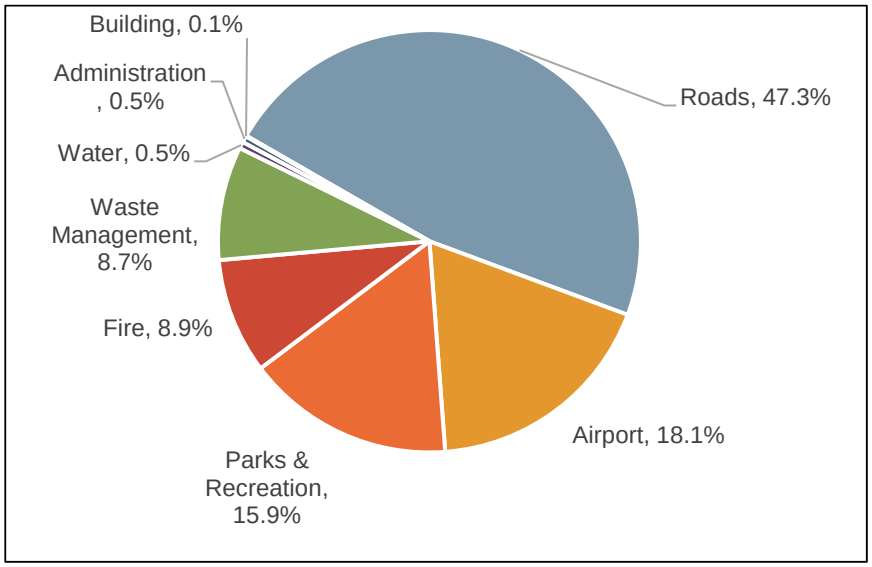
## 2.6 Equipment

### 2.6.1 State of Local Infrastructure

The Township has 194 pieces of equipment that have been included in this asset management plan. These include a few categories of pooled assets where multiple similar assets are combined into one line, e.g., software, radios and emergency generators. The equipment ranges in value from $500,000 for fuel tanks at the airport to pooled equipment with low replacement values that individually would not meet the capitalization thresholds as identified in the Township's tangible capital asset policy. The total replacement value of equipment is $5.75 million.

Figure 2-8 shows how the replacement value of equipment is distributed across departments. The Roads department has almost half of the equipment (47%). Most of the rest of the equipment is divided amongst four departments, Airport (18%), Parks & Recreation (16%), Fire (9%), and Waste Management (9%). The remaining 1% of equipment replacement value is accounted for by Water, Administration, and Building departments combined.

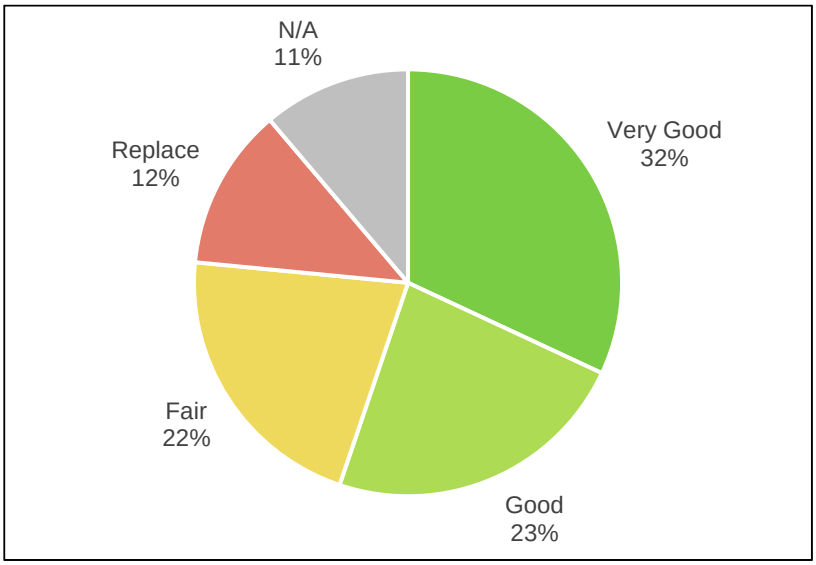
Figure 2-8
Distribution of Equipment Replacement Value by Department




## 2.6.2 Condition

The condition of equipment is evaluated based on age in the same way fleet assets are, utilizing the qualitative condition states as summarized in Table 2-16 in the fleet section. The acquisition dates for 11% of equipment by replacement value are not known. For the assets where the age is known, the average UL % is 78.6%. Figure 2-9 shows the distribution of replacement value by condition. A majority of assets, 55% are in Very Good or Good condition according to this age-based analysis. 22% of assets are rated as Fair indicating that they are likely to require replacement in the near future. 12% of assets are rated as Replace, indicating that it is likely they are well past their expected useful life and replacement is likely imminent.

Figure 2-9
Equipment Asset Condition Distribution




### 2.6.3 Current Levels of Service

Mirroring the analysis described in Section 2.5.3 for fleet, most equipment is likely to be replaced when it is in Fair condition (90% of UL to 140% of UL). As with fleet assets, a good performance measure for how well the Township is keeping up with asset replacements is the percentage of replacement value rated as Replace. As with fleet assets, lower is better. Currently, 12% of the Township's equipment assets are rated as Replace. Note that this could be an underestimate of the performance measure because acquisition date is unknown for equipment with a value of $643,000 (11% of total).

### 2.6.4 Proposed Levels of Service

As with fleet, if the Township intends to manage its equipment to maintain functionality, each type of equipment should be replaced near its expected useful life. This means that it is reasonable to expect that only a relatively small number of equipment assets will have a UL % greater than 140%. As a preliminary level of service target, the Township will seek to minimize the proportion of equipment (based on replacement value) with an age-based condition rating of Replace.

# Chapter 3
# Lifecycle Management Strategy

# 3. Lifecycle Management Strategy

## 3.1 Introduction

This chapter details the lifecycle management strategies required to maintain the current levels of service presented in section 2. A lifecycle management strategy identifies the lifecycle activities that would need to be undertaken to achieve the stated level of service objectives. Lifecycle activities are the specified actions that can be performed on assets to increase service level and extend service life. These actions can be carried out on a planned schedule in a prescriptive manner, or through a dynamic approach where the treatments are only carried out when specified conditions are met.

O. Reg. 588/17 requires that all potential lifecycle activity options be presented, with the aim of analyzing these options in search of identifying the set of lifecycle activities that can be undertaken at the lowest cost to maintain current levels of service or to provide proposed levels of service. Asset management plans must include a 10-year capital plan that forecasts the lifecycle activities resulting from the lifecycle management strategy.

What follows are the lifecycle management strategies for all asset classes contained within this asset management plan, with each section focusing on an individual asset class. The lifecycle management strategy for age-based assets is presented in the last section of this chapter.

## 3.2 Roads

### *3.2.1 Lifecycle Activities*

This section details the lifecycle activities as identified through discussions with Township staff. The lifecycle activities that the Township currently employs in the management of its roads include:

- Resurfacing – Slurry Seal;
- Resurfacing – Single Surface Treatment (SST); and
- Reconstruction – Double Surface Treatment and Fog Seal (DST/F).

Table 3-1 details the costs associated with undertaking these lifecycle activities, by surface type. The costs are presented on a dollar per square metre basis. These costs are based on recent tenders for roads projects in the Township.

Table 3-1
Road Treatment Costs (per m²)

| Treatment | Cost/m² |
|---|---|
| Slurry Seal | $3.20 |
| SST | $4.30 |
| DST/F | $16.00 |

### *3.2.2 Degradation Profiles*

Assets deteriorate over time, eventually reaching a point where they have no remaining service life. However, the path each asset takes in reaching its end of life differs, even for assets of the same type. A condition rating identifies where along the path any particular asset lies, or in other words, how long an asset has left before it reaches its end of life. Therefore, condition and service life are linked, and can be plotted graphically to visually represent the degradation curve of an asset.

While degradation curves can be non-linear, a straight line is currently being used as a first approximation. Through the process of conducting regular road condition inspections, the Township will be able to further refine the degradation profiles over time.

### *3.2.3 Decision Criteria*

The Township plans to follow a 5-year resurfacing schedule that alternates slurry seals with single surface treatments until a road is reconstructed with a double surface treatment and fog seal. Roads have been divided into two categories, major and minor, based on expected deterioration rates. Major roads are expected to need reconstruction every 20 years. Minor roads are expected to last 40 years between reconstructions. Table 3-2 presents the decision criteria for triggering each road treatment. Age is expected to be the main driver of resurfacing. However, if significant deviation in condition is observed, treatments could be accelerated or delayed.

Table 3-2
Roads Treatment Decision Criteria

| Road Category | Treatment | Age | Expected Condition | Condition Improvement |
|---|---|---|---|---|
| Major | Slurry seal | 5 | 83 | 5 |
| | SST | 10 | 70 | 10 |
| | Slurry seal | 15 | 63 | 5 |
| | DST/F | 20 | 50 | 100 |
| Minor | Slurry seal | 5 | 88 | 5 |
| | SST | 10 | 80 | 10 |
| | Slurry seal | 15 | 78 | 5 |
| | SST | 20 | 70 | 10 |
| | Slurry seal | 25 | 68 | 5 |
| | SST | 30 | 60 | 10 |
| | Slurry seal | 35 | 58 | 5 |
| | DST/F | 40 | 50 | 100 |

### *3.2.4 Expected Lifecycle*

Combining the treatments, degradation profiles, and decision criteria presented herein results in a complete lifecycle management strategy. Figure 3-1 and Figure 3-2 provide illustrative examples of the expected lifecycle of major and minor roads, respectively. The dashed, vertical lines represent points of intervention in the representative road's expected life. The lifecycle path of the asset is represented by the solid lines. Finally, the grey, dotted line illustrates the expected lifecycle of a road segment were it to not receive any treatments over the course of its service life.

Figure 3-1
Lifecycle Strategy – Major Roads

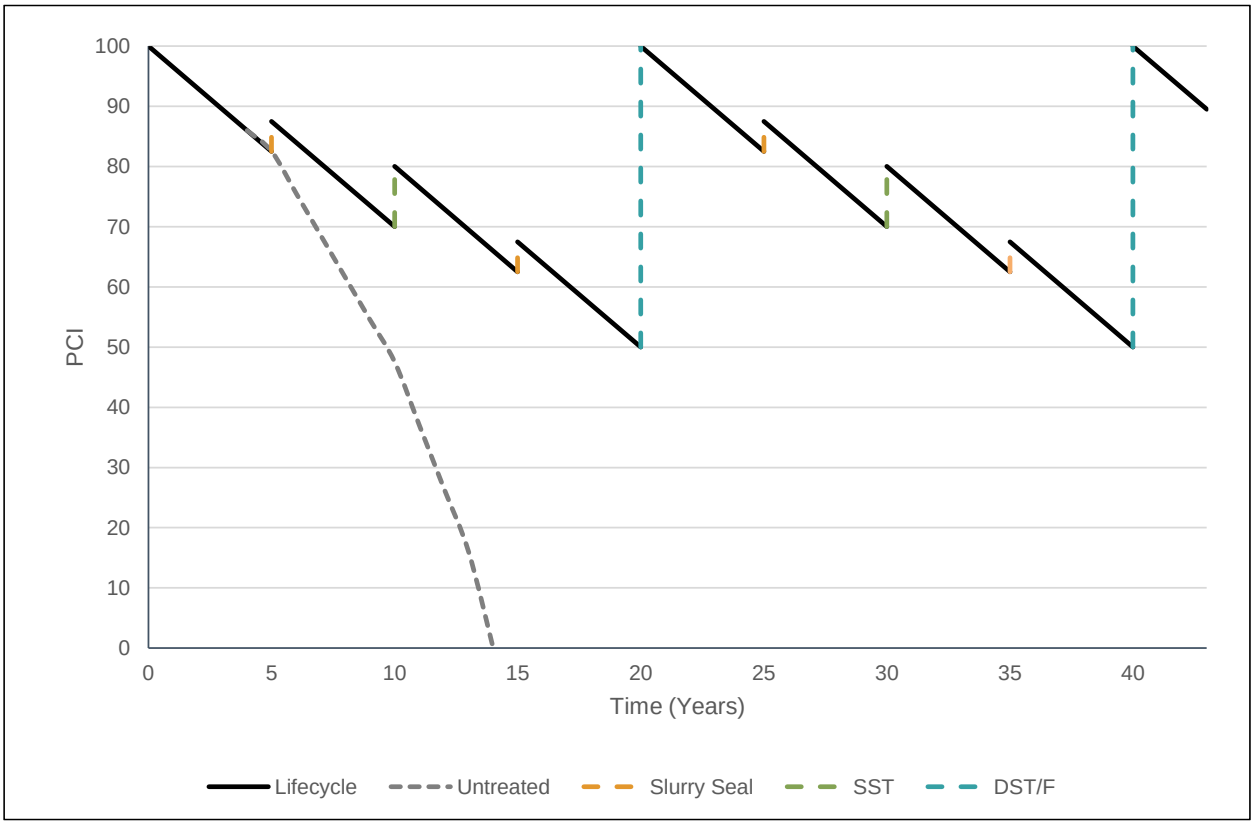
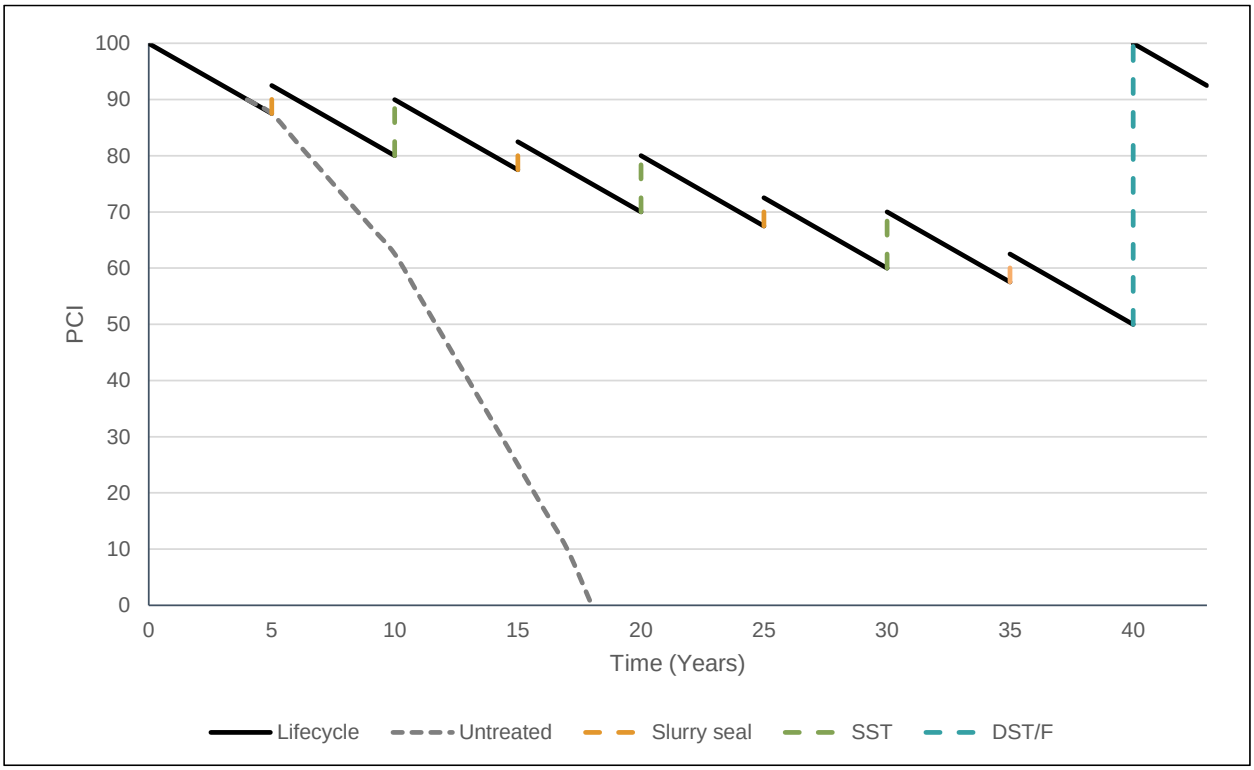


Figure 3-2
Lifecycle Strategy – Minor Roads



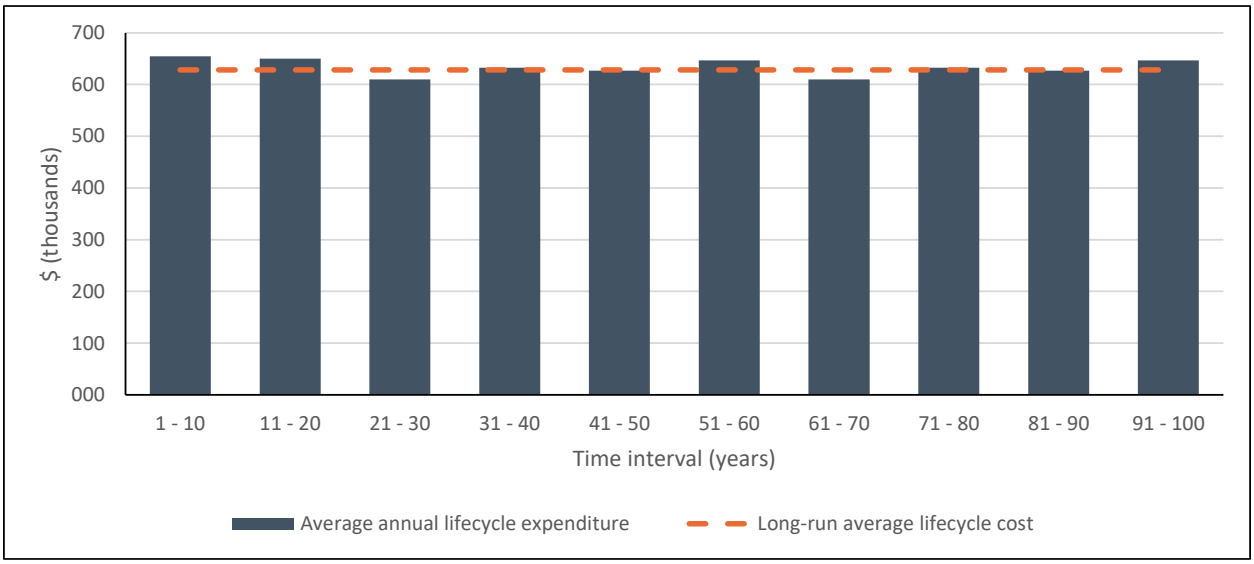

### *3.2.5 Average Annual Lifecycle Cost*

Figure 3-3 presents the long-range forecast of expenditures over the next 100 years, averaged for each decade. Gravel roads were excluded because they are typically not reconstructed, but rather managed through ongoing operating practices such as grading and adding granular material as needed. This forecast illustrates the annual expenditures without any consideration of budgetary constraints. The dotted orange line shows that the average annual investment required to support the lifecycle management strategies is approximately $628,000, in 2020 dollars.

The estimated average annual funding requirement of $628,000 reflects the typical lifecycle costs identified above. It is important to note that in reality assets do not follow a precise lifecycle path and from time to time issues may arise that are beyond what the generalized lifecycle models can predict. One such example are the four areas of North Shore Road that are experiencing severe deterioration and embarkment erosion. The Township retained Engage Engineering in 2018 to identify and evaluate existing conditions in respect of the four impacted sections of North Shore Road, evaluate

available rehabilitation options, and provide cost estimates for the rehabilitation options. The cost estimate for the proposed rehabilitation work totalled approximately $657,000. Unless the Township can secure external funding for this work, a year's worth of regular road lifecycle rehabilitation and renewal work would need to be delayed.

Figure 3-3
Road Lifecycle Management Strategy – Average Annual Funding Requirements by Decade




## 3.3 Bridges and Structural Culverts

### *3.3.1 Managing Bridges and Culverts*

O. Reg. 104/97 requires that structural bridges and culverts be inspected every two years by professional engineers. The Township plans to manage bridges and culverts by completing the work recommended in the inspection reports. By following the engineering recommendations, the Township believes it can continue to operate the bridges safely on an ongoing basis.

The most recent inspection was done in 2018. In that report, projects with a total cost of $155,500 were identified that needed to be done over the next 10 years. At the time of the completion of this report, projects with a cost of $17,500 had been completed. Table 3-3 describes the remaining projects that need to be done, their cost, and timing. This information will be updated every two years after each round of bridge inspections.

Table 3-3
List of repair and rehabilitation work recommended in 2018 OSIM report.

| Structure | Element | Repair and rehabilitation required | Urgent | Year 1-5 | Year 6-10 |
|---|---|---|---|---|---|
| AH1: Bear Lake Road Bridge | Abutment cribs | Replace cribbing system | | $100,000 | |
| | Curb | Replace timber curbs | | | $1,000 |
| | Streams & Waterways | Armour south abutment to prevent further erosion at waterway. | | $1,500 | |
| | Abutment wall | Replace deteriorated timber members in abutment at NW quadrant. | | | $20,000 |
| AH2: Buckslide Dam Bridge | Slope protection | Add slope protection | | $15,000 | |
| AH3: St. Peter's Bridge | Railing systems | Replace guiderail at north end of bridge. | $8,000 | | |
| AH5: Airport Road Bridge | Approach barriers | Replace northeast guardrail. | $5,000 | | |
| | Joints | Replace joint seals. | | $5,000 | |
| | | Total | $13,000 | $121,500 | $21,000 |

### *3.3.2 Estimating Long-run Needs*

The current OSIM report has identified average annual funding needs for bridges and culverts of $15,550 over the next ten years. The purpose of this section is to estimate long-term needs and identify potential peaks in investment demand at a decade timescale. To do this, a generalized model of bridge and culvert lifecycles is created and subsequently used to create a long-run projection of funding needs.

#### *3.3.2.1 Lifecycle Activities*

This section identifies a generalized lifecycle model for bridges and culverts. The following lifecycle activities have been included in the generalized lifecycle model:

- Bridge:
- Minor Rehabilitation;

- Major Rehabilitation;
- Reconstruction;
- Culvert:
- Reconstruction.

Table 3-4 provides estimated replacement cost per square metre of deck area. Table 3-5 details the costs for the rehabilitation lifecycle activities listed above. These costs are presented as a percentage of replacement value, corresponding to the extent of rehabilitation work expected at different stages of an asset's lifecycle.

Table 3-4
Bridge and Culvert Replacement Costs per Square Metre of Deck Area

| Structure Type | Replacement Cost per Square Metre |
|---|---|
| Bridge | $5,200 |
| Culvert | $3,800 |

Table 3-5
Bridge Rehabilitation Treatment Costs as a Per cent of Replacement Cost

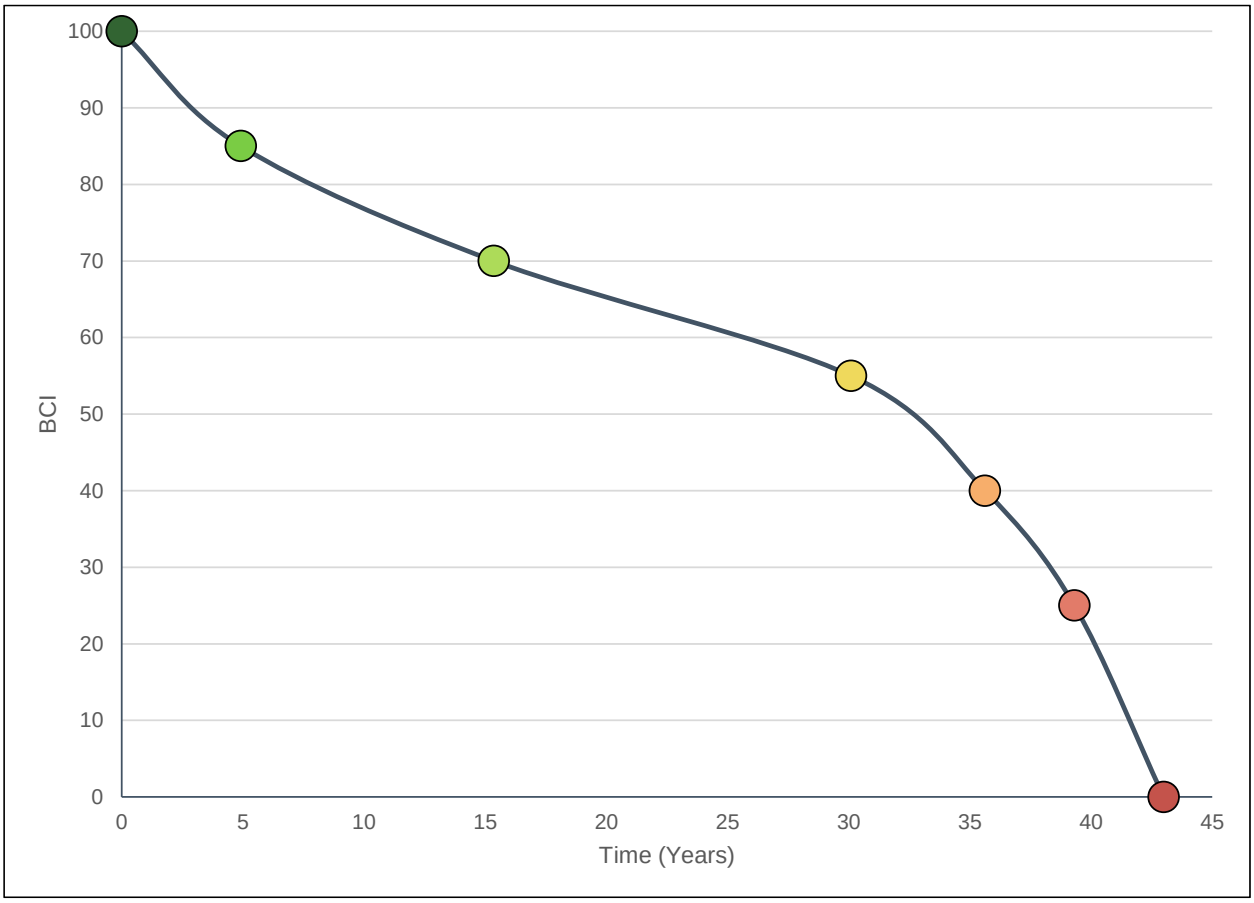
| Treatment | Percent of Replacement Value |
|---|---|
| Bridge minor rehabilitation | 20% |
| Bridge major rehabilitation | 33% |

### *3.3.2.2 Degradation Profiles*

Assets deteriorate over time, eventually reaching a point where they have no remaining service life left. However, the path each asset takes in reaching its end of life differs, even for assets of the same type. A condition rating identifies where along the path any particular asset lays, or in other words, how long an asset has left before it reaches its end of life. Therefore, condition and service life are linked, and can be plotted graphically to visually represent the degradation curve of an asset.

Figure 3-4 presents the assumed degradation profile of bridges and culverts.

Figure 3-4
Bridges & Culverts Degradation Profile




### *3.3.2.3 Decision Criteria*

Table 3-6 presents the modelling decision criteria for triggering specific bridge and culvert treatments. When all the decision criteria for a given asset are met, the corresponding treatment is applied. When a treatment is applied, the BCI of the asset is improved by the amount specified in the "Gain to Condition" column, but not to exceed the amount listed in the "Maximum Condition Threshold" column. Culverts are not rehabilitated.

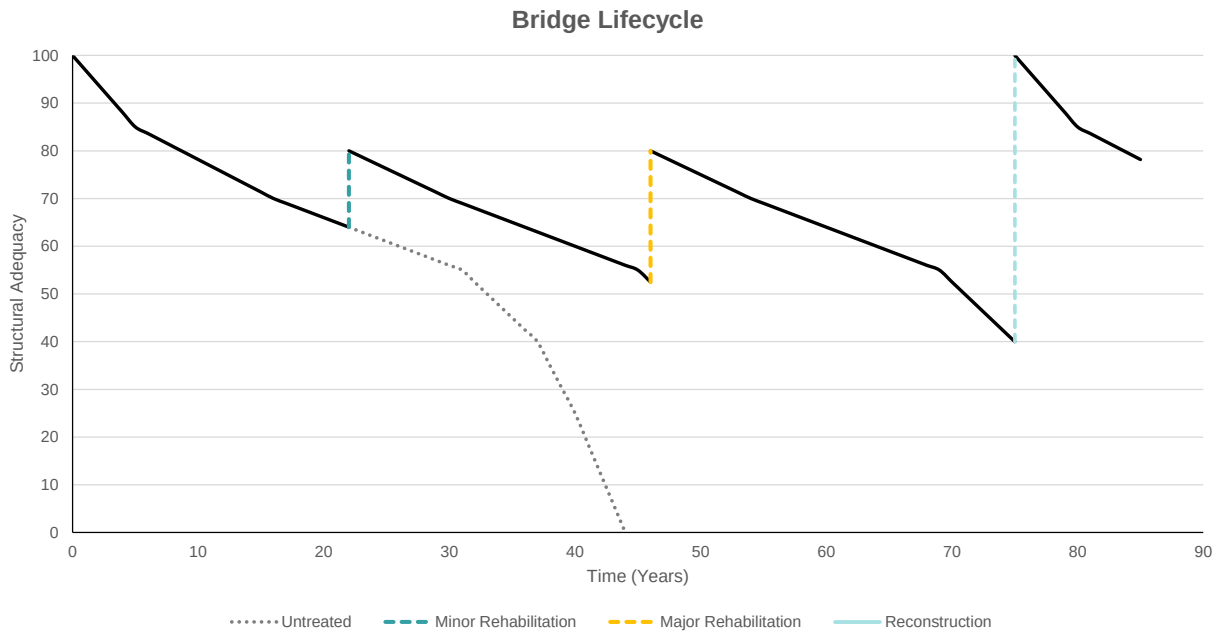
Table 3-6
Bridge and Culvert Treatment Decision Criteria

| Asset Type | Treatment | BCI Range | Gain to Condition | Maximum Condition Threshold |
|---|---|---|---|---|
| Bridges | Minor Rehabilitation | 55 - 65 | +30 | 80 |
| | Major Rehabilitation | 41 - 54 | +50 | 80 |
| All | Reconstruction | 0 - 40 | +100 | 100 |

#### *3.3.2.4 Expected Lifecycle*

Combining the treatments, degradation profiles, and decision criteria presented herein results in a complete lifecycle management strategy. Figure 3-5 provides an illustrative example of the modelled lifecycle for bridges. The dashed, vertical lines represent points of intervention in the representative asset's expected life. The lifecycle path of the asset is represented by the solid lines, following the degradation profile presented above. Finally, the grey, dotted line demonstrates the expected lifecycle of an asset were it to not receive any treatments over the course of its service life.

Figure 3-5
Lifecycle Strategy – Bridges

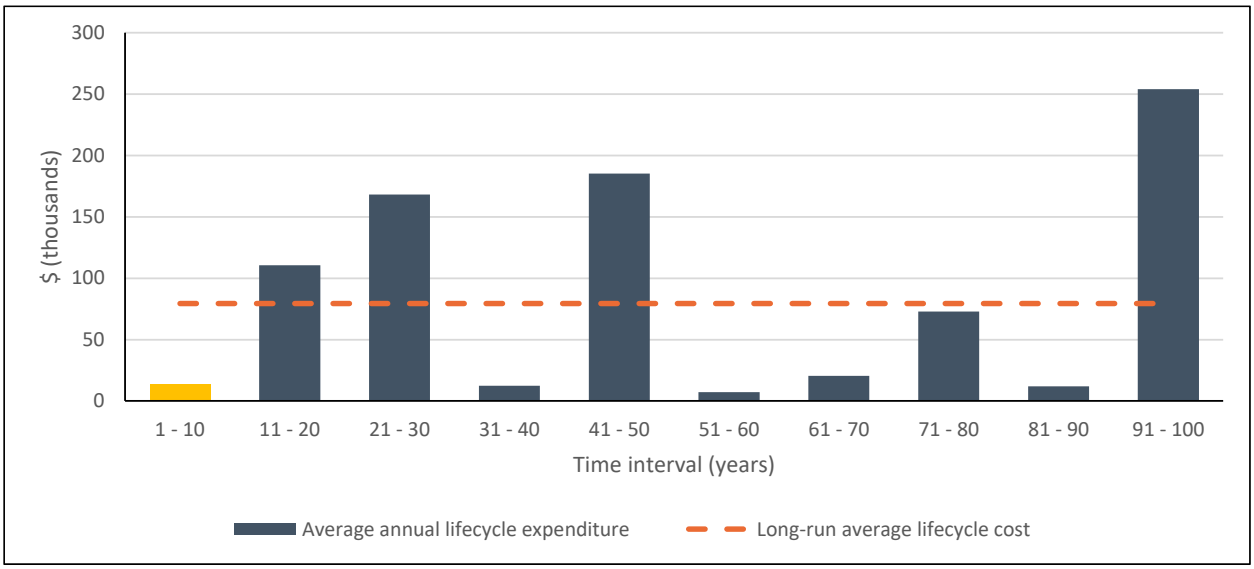



The lifecycle strategy for culverts is to reconstruct (replace) when a BCI of 40 is reached. While this strategy may seem basic, it results in more accurate forecasting because it is informed by the assessed condition rather than age. As the asset's condition is regularly re-assessed over time, the timing of the eventual reconstruction could vary significantly from an age-based approach. For example, if the environment that the culvert resides in causes it to degrade faster or slower than the expected average, and the assessed condition rating reflects this, then the eventual replacement will be triggered at a different time than an age-based approach.

### *3.3.2.5 Average Annual Lifecycle Cost*

Figure 3-6 presents the long-range forecast of expenditures over the next 100 years, averaged for each decade. This forecast illustrates the annual expenditures without any consideration of budgetary constraints. The dotted orange line shows that, over the next 100 years, the required average annual investment is approximately $79,000, in 2020 dollars. The value for the first decade is based on the OSIM report and is coloured yellow to distinguish it from the estimates from the long-range forecast.

Figure 3-6
Bridge & Culvert Lifecycle Management Strategy – Average Annual Funding Requirements by Decade




## 3.4 Facilities

### *3.4.1 Lifecycle Model*

For facility assets with component-level condition assessments, the lifecycle model is based on the assessment. The first replacement identified for each component is based on the asset condition and the assessor's estimate of remaining useful life. The reliability of the estimate of remaining useful life decreases as the remaining useful life increases because of unavoidable uncertainty in future performance of components. This means that the accuracy of the timing of forecasted replacements decreases in later years. Replacements for an asset after the first replacement are set based on expected useful life and are even more speculative because they are no longer based on information on the specific asset. The expected useful life assumptions are documented in Appendix C.

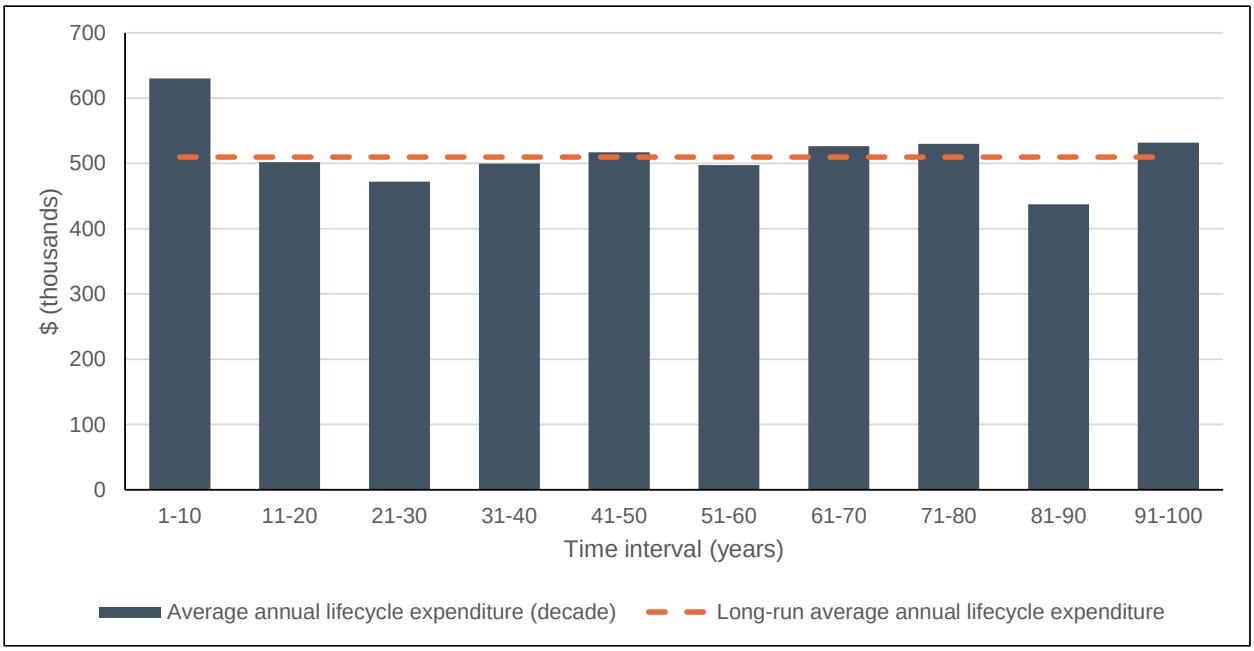
While the condition assessment is expected to inform short-term priorities, further testing and planning is needed to properly scope and cost projects further out in the forecast. The Township should plan to update facility condition assessments with a regular frequency and ensure that there are clear mechanisms in place to identify and address issues that develop between facility condition assessments.

For facilities without component-level condition assessments, a more generalized lifecycle management strategy is needed. Long-run funding needs were identified by estimating a useful life for the facility as a whole. If a facility-level condition was assessed, it was used to estimate the timing of asset replacement. If no assessment was done, an average annual lifecycle cost was used. Since assets that were not assessed are relatively simple, staff should be able to evaluate when the assets need to be repaired or replaced. The Township should ensure that there is a process in place to track work that needs to be done for these assets.

### *3.4.2 Average Annual Lifecycle Cost*

Figure 3-7 presents the long-range forecast of expenditures over the next 100 years, averaged for each decade. This forecast illustrates the annual expenditures without any consideration of budgetary constraints. The dotted orange line shows that, over the next 100 years, the required average annual expenditure is approximately $459,000, in 2020 dollars.

Figure 3-7
Facilities Lifecycle Management Strategy – Average Annual Funding Requirements by Decade



## 3.5 Fleet

### 3.5.1 Lifecycle Model

Major rehabilitations are rarely done to extend the useful life of vehicles. Typically, maintenance and relatively low-cost repairs are done until the vehicle reaches a point where it is cheaper to replace the vehicle than to continue repairing it. Ongoing maintenance and repair are generally funded out of operating budgets and are not covered in this asset management plan. For asset management purposes, the lifecycle model consists of one lifecycle activity: Vehicle replacement.

### 3.5.2 Expected Lifecycle

Township staff have identified expected useful lives for vehicles based on their experience operating and maintaining them. Table 3-7 shows the expected lifespans of vehicles, grouped by categories as presented in Table 2-15. The rescue support category under Fire is the only category that has vehicles with different expected useful lives. It is further broken down in Table 3-7 to show expected useful lives of subcategories.

Table 3-7
Fleet – Expected Useful Lives

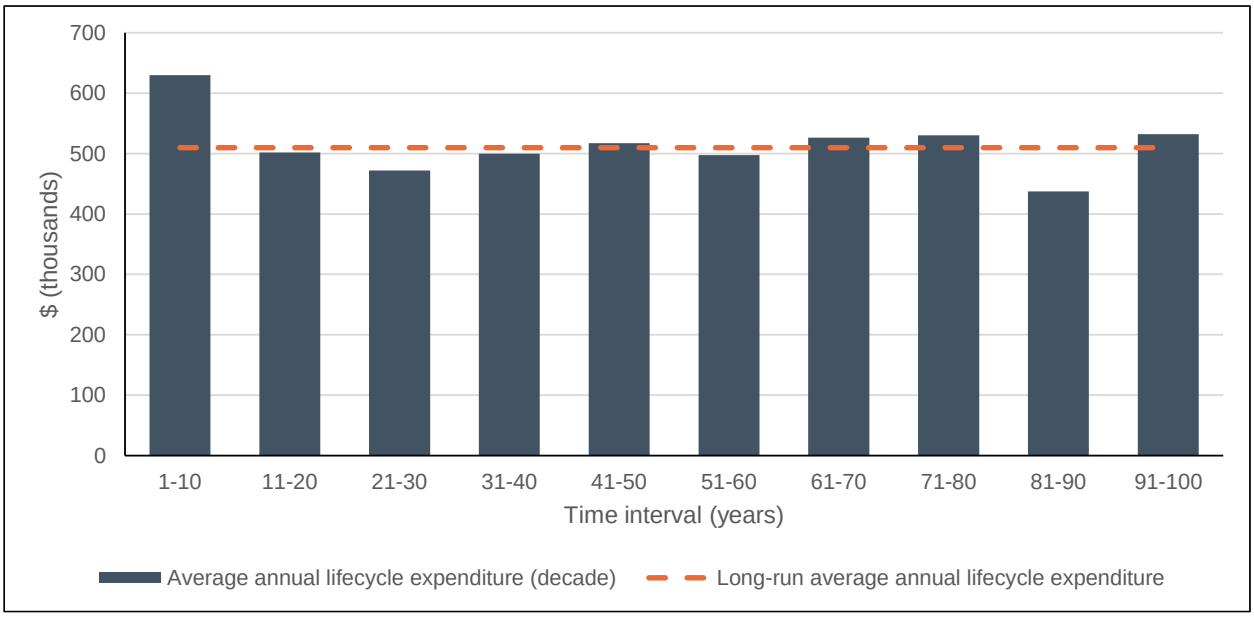
| Category | Expected Useful Life |
|---|---|
| **Fire** | |
| Frontline pumper | 18 |
| Remote access support | 10 |
| Rescue support | 7 - 20 |
| Medium rescue | 12 |
| Heavy rescue | 20 |
| Chiefs unit 1 | 7 |
| Tanker | 20 |
| Water access support | 25 |
| **Public Works** | |
| Dump truck 5-ton or less | 10 |
| Dump truck 5-ton or more | 10 |
| Pickup truck | 8 |

| | |
|---|---|
| Parks & Recreation | |
| Pickup truck | 8 |
| **Parks & Recreation/Public Works** | |
| Utility vehicle | 10 |
| Building Dept. | |
| Passenger car | 8 |
| **Airport** | |
| Pickup truck | 8 |

### *3.5.3 Average Annual Lifecycle Cost*

Figure 3-8 presents the long-range forecast of expenditures over the next 100 years, averaged for each decade. This forecast illustrates the annual expenditures without any consideration of budgetary constraints. The dotted orange line shows that, over the next 100 years, the required average annual expenditure is approximately $509,000, in 2020 dollars.

Figure 3-8
Fleet Lifecycle Management Strategy – Average Annual Expenditures by Decade



## 3.6 Equipment

### *3.6.1 Lifecycle Model*

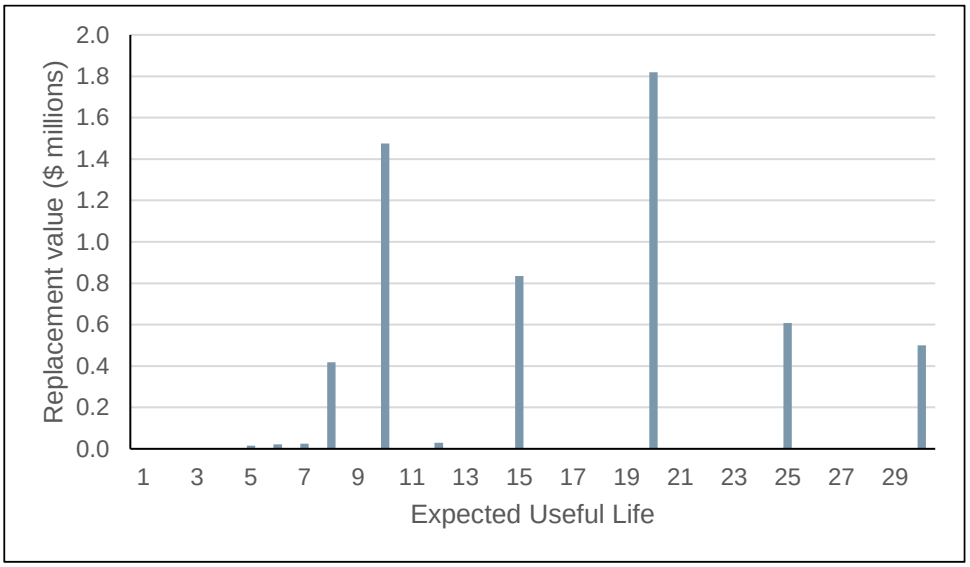
Major rehabilitations are rarely done to extend the useful life of equipment. Typically, maintenance and relatively low-cost repairs are done until equipment no longer functions as intended. Ongoing maintenance and repair are generally funded out of operating budgets and are not covered in this asset management plan. For asset management purposes, the lifecycle model consists of one lifecycle activity: Equipment replacement.

### *3.6.2 Expected Lifecycle*

For most equipment, it is either functioning as intended or in need of replacement. Condition is one of two states: Functioning or Not Functioning. Assets in the equipment category have a wide variety of failure modes making it difficult to list criteria for replacement. At this stage of asset management plan development, no degradation profiles or analysis can be provided for equipment. Instead, replacement modeling is based solely on age and expected useful life. Staff should periodically review and update assumptions on expected useful lives based on actual data on when equipment is replaced.

Township staff have identified expected useful lives for equipment based on their experience using the assets. The wide variety of equipment in use by the Township makes creating a summary table difficult. Instead, a higher-level summary is provided in Figure 3-9. It shows the distribution of replacement value by expected useful life for equipment. Most equipment has an expected useful life between 8 and 30 years. The histogram is spikey because estimates of useful life are usually given in round numbers.

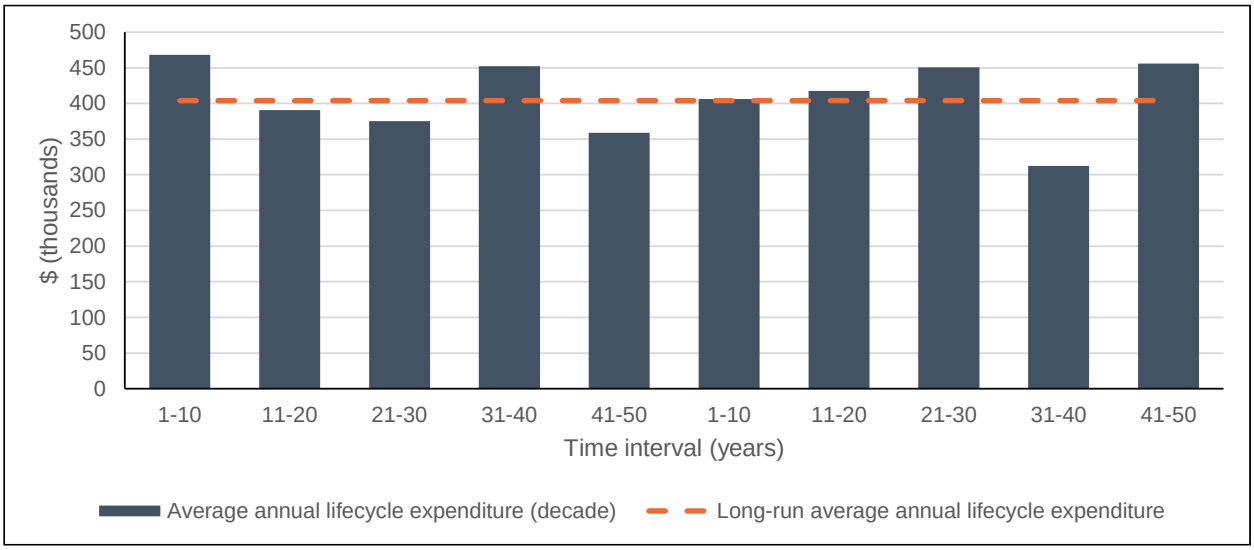
Figure 3-9
Equipment – Distribution of Replacement value by Expected Useful Life




### *3.6.3 Average Annual Lifecycle Cost*

Figure 3-10 presents the long-range forecast of expenditures over the next 100 years, averaged for each decade. This forecast illustrates the annual expenditures without any consideration of budgetary constraints. The dotted orange line shows that, over the next 100 years, the required average annual expenditure is approximately $404,000, in 2020 dollars. Note that average annual lifecycle costs were used for assets with unknown acquisition dates instead of identifying specific timing of replacements.

Figure 3-10
Equipment Lifecycle Management Strategy – Average Annual Expenditures by Decade



# Chapter 4
# Financing Strategy

# 4. Financing Strategy

## 4.1 Introduction

This chapter details the financing strategy that would sustainably fund the lifecycle management strategies presented in Chapter 3. This financing strategy focuses on examining how the Township can fund the lifecycle activities required to maintain its assets at the current and/or proposed levels of service. The strategy presented is a suggested approach which should be examined and re-evaluated during the annual budgeting processes to ensure the sustainability of the Township's financial position as it relates to its assets.

O. Reg. 588/17 requires a 10-year capital plan that forecasts the costs of implementing the lifecycle management strategy and the lifecycle activities required therein. The financing strategy in this asset management plan has been developed for a 20-year forecast period to enable the Township to evaluate the sustainability of its assets over a longer-term horizon.

Various financing options, including reserve funds, debt, and grants were considered during the process of developing the financing strategy. The recommended financing strategy identifies rehabilitation and replacement activities required over the forecast period, as described in preceding sections of this plan.

## 4.2 Annual Costs

Table B-1 presents the capital expenditure forecast for each asset class over the 2021-2040 forecast period. This expenditure forecast is based on the lifecycle activities identified in preceding sections of this plan.

The expenditure forecast includes a capital inflation factor of 3.5% annually, which aligns closely with the historical 20-year annual average rate of inflation as witnessed in Statistics Canada's Building Construction Price Index.

## 4.3 Funding

Table B-4 summarizes the recommended strategy to finance the asset lifecycle costs identified in Table B-1. This funding forecast was based on the funding sources identified in the Township's 2020 budget.

The lifecycle costs required to sustain established level of service targets are being recovered through several methods:

- Ontario Community Infrastructure Fund (OCIF) formula-based funding is identified for years in which the funding amount is known (2020). The 2020 level of OCIF funding is then maintained for the remaining years of the forecast, recognizing the OCIF as a stable and long-term funding source for capital projects.
- Gas tax funding has been shown as a stable and long-term funding source for eligible capital projects. Annual funding estimates are based on Township's estimates for 2021-2023. The funding in subsequent years has been maintained at the 2023 level.
- The Township will be dependent upon maintaining healthy capital reserves/reserve funds in order to provide the remainder of the required lifecycle funding over the forecast period. This will require the Township to proactively increase amounts being transferred to these capital reserves during the annual budget process.
- Debt financing is shown as required in years where significant capital needs are identified. Specifically, the forecast includes $500,000 of debt financing in 2021. It is important to note, however, that a significant share of capital expenditures identified in the forecast for 2021 is related to a backlog of fleet and equipment replacements. This backlog is somewhat theoretical, in that it is based on a comparison of asset age to the expected useful life. Some fleet and equipment assets may continue to function reliably well beyond their expected useful life. If the replacement of some of the fleet and equipment assets could be delayed beyond 2021, then the need for debt financing could be reduced or eliminated.

### *4.3.1 Funding Shortfall*

This financing strategy has been developed to be fully funded, and therefore no funding shortfall has been identified. However, this means that if identified grants are not

received at expected amounts then shortfalls may present themselves. In such an event, the difference could be made up through increases to the tax levy over-and-above those presented hereafter.

## 4.4 Tax Levy Impact

While the annual funding requirement may fluctuate, it is important for the Township to implement a consistent, yet increasing, annual investment in capital so that the excess annual funds can accrue in capital reserve funds. Table B-4 presents a summary of the impacts on the tax levy as a result of this financing strategy.

In order to fund the recommended asset lifecycle activities over the forecast period using the Township's own available funding sources (i.e. using taxation, Gas Tax funding, OCIF funding, and debentures), an increase in the Township' taxation levy would be required as follows:

- 6.49% increases annually for 2021-2026
- 3.50% increases annually for 2027-2040

Consideration for cash-flow and positive reserve fund balances has been included in setting the capital reserve transfer amounts. A detailed schedule of all capital-related reserves can be viewed in Table B-3.

Layering on assessment increases resulting from new assessment growth, assumed to be approximately 0.93% annually, the impacts on individual property tax bills resultant from the financial strategy would be as follows:

- 5.51% increases annually for 2021-2026
- 2.55% increases annually for 2027-2040

The taxation impacts identified above include inflationary adjustments to the Township's operating costs and revenues as identified in its 2020 budget (i.e. general operating inflation of 2% annually). However, if other funding sources become available (as mentioned above), or if maintenance practices allow for the deferral of capital works, then the impact on the Township's taxation levy would potentially decrease.

Further detail on the Financing Strategy is presented in Appendix B

# Chapter 5
# Recommendations

# 5. Recommendations

The following recommendations have been provided for consideration:

- That the Township of Algonquin Highlands Asset Management Plan be received and approved by Council;
- That consideration of this Asset Management Plan be made as part of the annual budgeting process to ensure sufficient capital funds are available to fund the Asset Management Plan; and
- That this Asset Management plan be updated as needed over time to reflect the current priorities of the Township.

Substantial investment in capital needs will be required over the forecast period, and through the recommendations provided through the financing strategy, proactive steps would be taken to sustainably fund the Township's network of assets. Both the capital needs identified in the 20-year forecast and the level of funding recommended in the financing strategy are consistent with the long-run average annual lifecycle funding target, which identifies the long-term annual investment level necessary to meet the levels of service identified in Chapter 2.