# Asset Management Plan – Core Assets

## Township of Frontenac Islands

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# List of Acronyms and Abbreviations

| | |
|---|---|
| BCI | Bridge Condition Index |
| IJPA | Infrastructure for Jobs and Prosperity Act |
| O. Reg. 588/17 | Ontario Regulation 588/17 |
| OSIM | Ontario Structure Inspection Manual |
| PCI | Pavement Condition Index |
| PSAB | Public Sector Accounting Board |

# 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 continual improvement and updates of the plan, to ensure its relevancy over the long term.

The Township of Frontenac Islands (Township) retained Watson & Associates Economists Ltd. (Watson) to develop a new asset management plan to replace the Township's 2013 Asset Management Plan. This asset management plan is the result of the first phase of the project. The intent of this phase is to bring the Township's asset management plan into compliance with the July 1, 2022 requirements of Ontario Regulation (O. Reg.) 588/17, and therefore covers the core municipal assets, comprising roads and structural culverts. The second and third phases of the project, to be completed over the next several months, will result in a comprehensive asset management plan covering all of the Township's assets (assets that support administration, transportation, marine, waste, recycling, fire, recreation, and medical services). The comprehensive asset management plan will include a financial strategy that balances cost with levels of service.

The total replacement cost of the Township's core assets that are included in this asset management plan is estimated at over $129 million. A breakdown of the total replacement cost by asset class is provided in Table 1-1. The most significant asset class by replacement cost is roads, accounting for approximately 99% of the replacement cost. Structural culverts account for the remaining 1%.

Table 1-1: Replacement Costs by Asset Class

| Asset Class | Replacement Cost (2022$) |
|---|---|
| Roads | $128,096,000 |
| Structural culverts | $1,199,000 |
| **Total** | **$129,295,000** |

## 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 (PSAB) 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 (now the Canada Community-Building Fund) 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. The 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 the IJPA. The intent of O. Reg. 588/17 is to establish standard content for municipal asset management plans. Specifically, the regulation require that asset management plans be developed that define the current levels of service, identify the lifecycle activities that will 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 to address the July 1, 2022 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 an approach 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, and current replacement cost valuation. Update the current replacement cost valuation, where required, using benchmark costing data or applicable inflationary indices.

2. Define and assess current asset conditions, based on a combination of Township staff input, existing background reports and studies (e.g., 2022 Road Needs Study and 2022 Ontario Structure Inspection Manual (OSIM) Bridge Inspection Report).

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

4. Develop lifecycle management strategies that identify the activities required to sustain the levels of service discussed above. The outputs of these strategies are summarized in the forecast of annual capital and operating expenditures required to achieve these levels of service outcomes.

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

# 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 class 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 class. 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.

The rest of this chapter addresses the requirements identified above.

## 2.2 State of Local Infrastructure

The Township owns and manages a variety of assets that support the provision of transportation services and that contribute to the overall level of service provided by the Township. The focus for the time being has been placed on the Township's roads and structural culverts as these are considered core assets under O. Reg. 588/17 and must be included in the Township's asset management plan by July 1, 2022. The analysis for transportation services will be expanded in the future to include all transportation assets that contribute in various ways to the overall level of service (e.g., sidewalks, streetlights, and signs).

The road network consists of roads with various surface types, including asphalt, surface treatment, and gravel. The estimated replacement cost of roads is $128.1 million. Table 2-1 provides a breakdown of the road network by surface type, showing centreline length, average age, and replacement cost. A visual rendering of the data presented in Table 2-1 is provided in Figure 2-1.

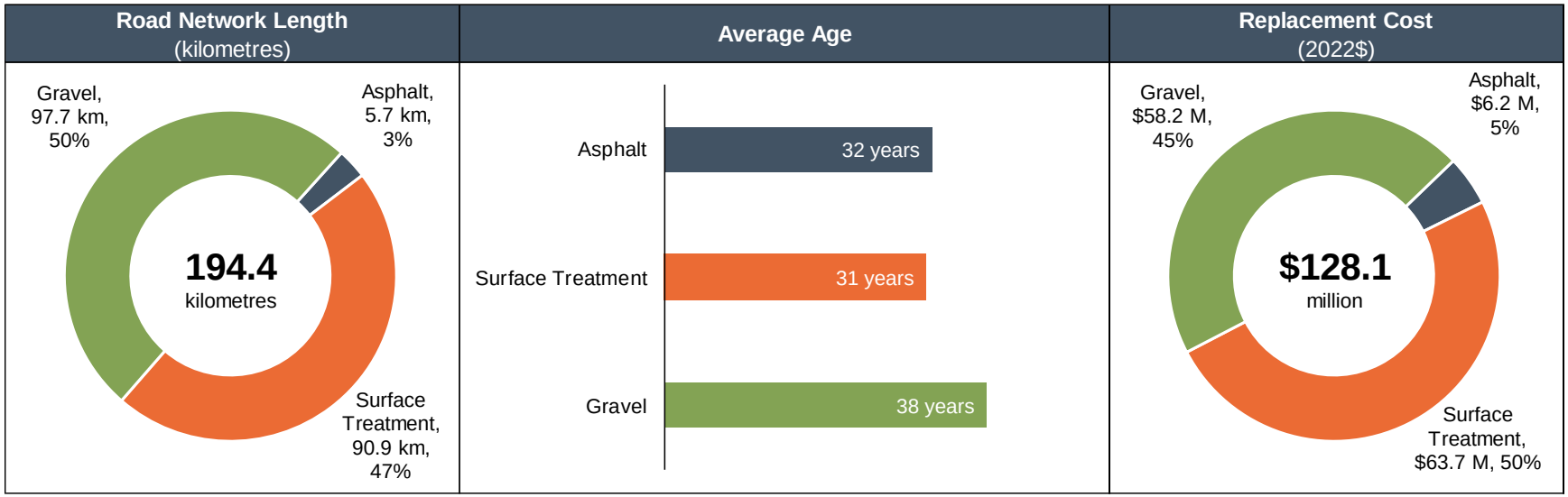
Table 2-1: Road Network – Length, Age, and Replacement Cost by Surface Type

| Surface Type | Centreline-kilometres | Average Age (years) | Replacement Cost (2022$) |
|---|---|---|---|
| Asphalt | 5.7 | 32.0 | $6,248,000 |
| Surface Treatment | 90.9 | 31.3 | $63,669,000 |
| Gravel | 97.7 | 38.5 | $58,179,000 |
| **Total** | **194.4** | **33.3** | **$128,096,000** |

The Township has three structural culverts (diameter ≥ 3m) with an estimated replacement cost of $1.2 million. Data to estimate the average age of the structural culverts is currently not available[1].

[1] One of the structural culverts is two years old. The ages of the other two structural culverts are unknown.

Figure 2-1: Summary Information – Road Network



## 2.3 Condition

The Township's roads were assessed as part of the Township's 2022 Road Needs Study and Condition Assessment, completed by Jewell Engineering Inc. Data collection and road ratings were done generally in accordance with the Ontario Ministry of Transportation's Inventory Manual for Municipal Roads (1991) (MTO Manual). In the Road Needs Study, several aspects of the Township's roads were evaluated, e.g., surface condition, drainage, horizontal and vertical alignment, and structural adequacy and others. In this AMP, the road condition is reported using the surface condition ratings. Surface condition ratings are on a 10-point scale, with 10 representing a road segment in as-new condition and 1 representing a failed road segment.

To better communicate the condition of the road network, the surface conditions for paved roads have been segmented into qualitative condition states as shown in Table 2-2. Moreover, descriptions of roads in these condition states are provided to better communicate the condition to the reader.

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

| Condition State | Description[1] |
|---|---|
| **Very Good** Surface Condition 9 or 10 | A very smooth ride. Pavement has few cracks. |
| **Good** Surface Condition 7 or 8 | A smooth ride with just a few bumps or depressions. The pavement has frequent very slight or slight cracking. |
| **Fair** Surface Condition 6 | A comfortable ride with intermittent bumps or depressions. The pavement has intermittent moderate and frequent slight cracking, and with intermittent slight or moderate alligatoring and distortion. |
| **Poor** Surface Condition 4 or 5 | An uncomfortable ride with frequent to extensive bumps or depressions. Cannot maintain the posted speed at lower end of the scale. The pavement has frequent moderate cracking and distortion, and intermittent moderate alligatoring. |
| **Very Poor** Surface Condition 2 or 3 | A very uncomfortable ride with constant jarring bumps and depressions. Cannot maintain the posted speed and must steer constantly to avoid bumps and depressions. The pavement has moderate alligatoring and extensive severe cracking and distortion. |
| **Failed** Surface Condition 1 | The pavement has extensive severe cracking, alligatoring and distortion. |

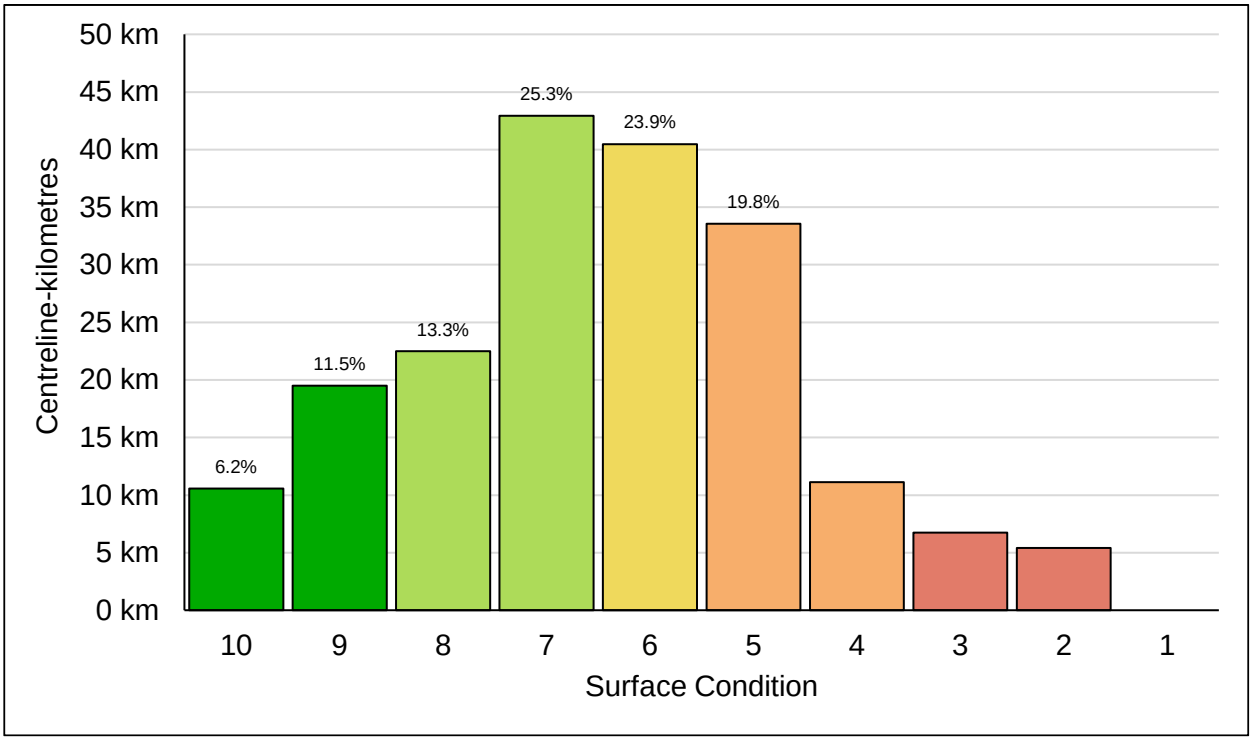
Table 2-3 shows the average surface condition of roads by surface type. On average, the Township's asphalt roads are in the Very Good condition state, surface treated roads are in the Good condition state, and gravel roads are in the Fair condition state. The distribution of the road network by surface condition is presented in Figure 2-2.

[1] Descriptions are adapted from the SP-024 Manual for Condition Rating of Flexible Pavements (Ontario Ministry of Transportation, 2016)

Table 2-3: Road Condition Summary

| Surface Type | Centreline-kilometres | Average Surface Condition | Average Condition State |
|---|---|---|---|
| Asphalt | 5.7 | 9.3 | Very Good |
| Surface Treatment | 90.9 | 6.8 | Good |
| Gravel | 97.7 | 6.0 | Fair |
| **Total** | **194.4** | **6.4** | **Fair** |

Figure 2-2: Distribution of Roads by Surface Condition



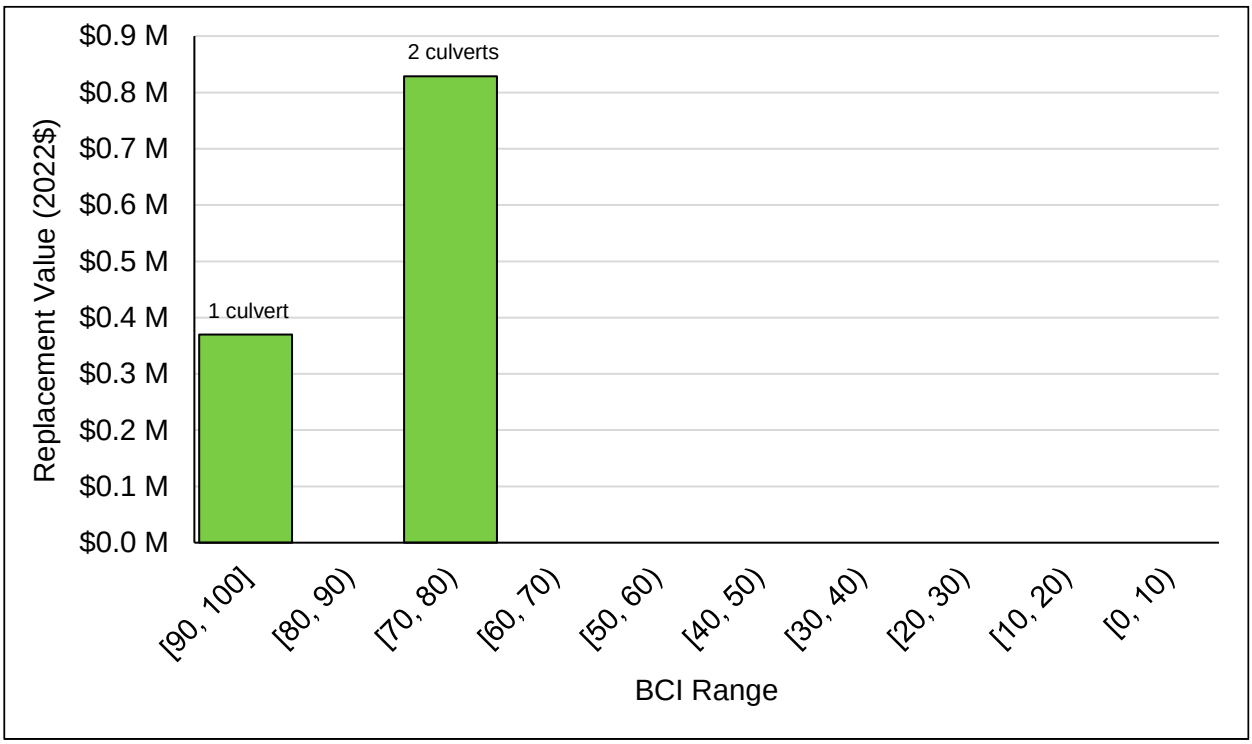

In accordance with O. Reg. 104/97, the Township completes biennial inspections of its structural culverts following the OSIM. The most recent inspections were completed by Jewell Engineering Inc. in 2022. Each structural culvert was assigned a Bridge Condition Index (BCI). The BCI is on a scale of 0 to 100, with 100 being an asset in as-new condition and 0 being a failed asset. Similar to the analysis for roads described above, the numeric condition ratings for structural culverts have been segmented into qualitative condition states. Photographs and descriptions of these condition states are provided in Table 2-4 to better communicate the condition to the reader.

Table 2-4: Examples and Descriptions of Structural Culvert Condition States

| Condition State | Structural Culvert Photos | Description |
|---|---|---|
| **Good**<br>70 ≤ BCI ≤ 100 |  | Maintenance is not usually required within the next five years. |
| **Fair**<br>60 ≤ BCI < 70 |  | Maintenance work is usually scheduled within the next five years. This is the ideal time to schedule major bridge repairs to get the most out of bridge spending. |
| **Poor**<br>0 ≤ BCI < 60 | No Examples | Maintenance work is usually scheduled within one year. Structural culvert may be at increased risk of requiring a loading restriction to be posted. |

On average, structural culverts are in a Good condition state. The distribution of structural culvert replacement cost by condition (as measured by BCI) is presented in Figure 2-3.

Figure 2-3: Distribution of Structural Culverts by BCI




### *2.3.1 Current Levels of Service*

The levels of service currently provided by the Township's transportation system are, in part, a result of the state of local infrastructure identified above. The levels of service framework defines the current levels of service that will be tracked over time. There are prescribed levels of service reporting requirements under O. Reg. 588/17 for core transportation assets (i.e., roads and structural culverts). Table 2-5 and Table 2-6 include the prescribed community and technical levels of service. In future iterations of the asset management plan, additional performance measures may be added to more comprehensively capture the level of service provided by transportation assets. Targets will also need to be set for all performance measures by July 1, 2025..

The tables are structured as follows:

- The Service Attribute columns indicate the high-level attribute being addressed;
- The Community Levels of Service column in Table 2-5 explains the Township's intent in plain language and provides additional information about the service being provided;

- The Performance Measure column in Table 2-6 describes the performance measure(s) connected to the identified service attribute; and
- The 2022 Performance column in Table 2-6 reports current performance for the performance measure.

Table 2-5: Community Levels of Service – Roads and Structural Culverts

| Service Attribute | Community Levels of Service |
|---|---|
| **Scope** | The Township's transportation assets enable the movement of people and goods within the Township and provide connectivity to the mainland and between the Township's islands. The Township's transportation assets are used by pedestrians, cyclists, passenger vehicles, commercial truck traffic, and emergency vehicles. |
| **Quality** | To aid in interpreting condition states, general descriptions of how each condition state may affect the use of these assets are provided in Table 2-2 and Table 2-4. Photos of structural culverts in different condition states are also shown in Table 2-4. |

Table 2-6: Technical Levels of Service – Roads and Structural Culverts

| Service Attribute | Performance Measure | 2022 Performance |
|---|---|---|
| **Scope** | Number of lane-kilometres of arterial roads as a proportion of square kilometres of land area of the Township. | Not Applicable |
| | Number of lane-kilometres of collector roads as a proportion of square kilometres of land area of the Township. | 1.102 lane-km/km² |
| | Number of lane-kilometres of local roads as a proportion of square kilometres of land area of the Township. | 1.055 lane-km/km² |
| | Percentage of bridges in the Township with loading or dimensional restrictions. | Not Applicable |
| **Quality** | For paved roads in the Township, the average pavement condition index[1] value. | 69 |
| | For unpaved roads in the Township, the average surface condition. | 6.0 |
| | For bridges in the Township, the average bridge condition index value. | Not Applicable |
| | For structural culverts in the Township, the average bridge condition index value. | 82.4 |

## 2.4 Population and Employment Growth

According to the 2021 census, the Township's 2021 population was 1,930. Based on the growth forecast contained in the Township's 2021 Development Charges Background Study, the Township's population is anticipated to reach 2,304 by 2036.

This growth in population is expected to result in incremental service demands that may impact the current level of service. These growth-related needs are summarized in the Township's 2021 Development Charges Background Study and are funded through development charges imposed on new development. Utilizing development charges

[1] The Township measures condition using a surface condition rating instead of the Pavement Condition Index. The average Pavement Condition Index has been estimated using the average surface condition rating multiplied by ten.

helps reduce the effects that future population and employment growth have on the cost of maintaining levels of service for existing tax and rate payers.

# Chapter 3
# Lifecycle Management Strategies

# 3. Lifecycle Management Strategy

## 3.1 Introduction

The lifecycle management strategy in this asset management plan identifies the lifecycle activities that would need to be undertaken to maintain the current levels of service presented in Chapter 2. Within the context of this asset management plan, lifecycle activities are the specified actions that can be performed on an asset in order to ensure it is performing at an appropriate level, and/or to extend its service life.[1] These actions can be carried out on a planned schedule in a prescriptive manner, or through a dynamic approach where the lifecycle activities are only carried out when specified conditions are met.

O. Reg. 588/17 requires that all potential lifecycle activity options be assessed, with the aim of identifying the set of lifecycle activities that can be undertaken at the lowest cost to maintain current levels of service. Asset management plans must include a ten-year capital forecast, identifying the lifecycle activities resulting from the lifecycle management strategy.

The following sections detail the ten-year forecasts of lifecycle activities and associated costs that would be required for the Township to maintain current levels of service.

[1] The full lifecycle of an asset includes activities such as initial planning and maintenance which are typically addressed through master planning studies and maintenance management, respectively.

## 3.2 Transportation Services

This section presents a preliminary estimate of the costs associated with maintaining the Township's roads and structural culverts at the current level of service. For roads, the estimate is based on the 2022 Road Needs Study and Condition Assessment. The lifecycle activities identified in the study were distributed over the 10-year forecast period based on the Priority Rating associated with each road segment. Higher priority lifecycle activities were scheduled ahead of lower priority lifecycle activities with adjustments being made to balance costs across years. Lifecycle activities for low-volume roads (AADT < 50) have not been included because the MTO Manual indicates that low-volume roads can usually be managed through normal maintenance procedures. The Road Needs Study reports the lifecycle activities for low-volume roads identified by following the MTO Manual methodology even though they are not typically performed. The total cost of the lifecycle activities identified for low-volume roads is $22 million. For structural culverts, the forecast is based on the 2022 OSIM report, which did not identify any capital needs.

The ten-year lifecycle expenditure forecast for roads and structural culverts is summarized in Figure 3-1 and provided in tabular form in Table 3-1. Average annual expenditures over the forecast period have been estimated at approximately $2.1 million.

Figure 3-1: Lifecycle Expenditure Forecast for Roads and Structural Culverts (2022$)

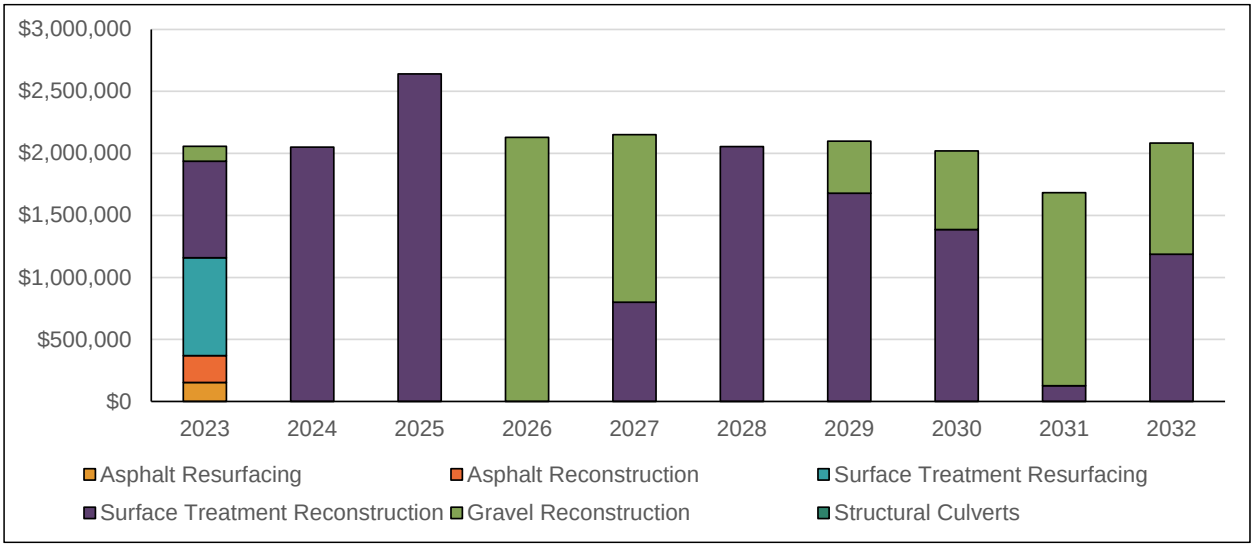


Table 3-1: Lifecycle Expenditure Forecast for Roads and Structural Culverts (2022$)

| Asset Class | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Roads** | | | | | | | | | | |
| Asphalt Resurfacing | $152,354 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| Asphalt Reconstruction | $217,696 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| Surface Treatment Resurfacing | $788,635 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| Surface Treatment Reconstruction | $778,351 | $2,050,657 | $2,640,973 | $0 | $800,098 | $2,055,508 | $1,679,488 | $1,385,858 | $127,644 | $1,186,812 |
| Gravel Reconstruction | $119,648 | $0 | $0 | $2,129,738 | $1,352,025 | $0 | $418,769 | $634,136 | $1,555,427 | $897,362 |
| **Sub-total Roads** | **$2,056,686** | **$2,050,657** | **$2,640,973** | **$2,129,738** | **$2,152,122** | **$2,055,508** | **$2,098,257** | **$2,019,994** | **$1,683,071** | **$2,084,173** |
| **Structural Culverts** | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| **Sub-total Structural Culverts** | **$0** | **$0** | **$0** | **$0** | **$0** | **$0** | **$0** | **$0** | **$0** | **$0** |
| **Total** | **$2,056,686** | **$2,050,657** | **$2,640,973** | **$2,129,738** | **$2,152,122** | **$2,055,508** | **$2,098,257** | **$2,019,994** | **$1,683,071** | **$2,084,173** |

# Chapter 4
# Summary

# 4. Summary

This asset management plan has been developed to address the July 1, 2022 requirements of O. Reg. 588/17. The plan provides summary information for the Township's core infrastructure assets (including replacement cost valuation and condition), identifies current levels of service, and includes a 10-year forecast of lifecycle activities and associated costs that would be required for the Township to maintain current levels of service. The plan is based on the best information available to the Township at this time. The Township is actively working on further expanding the asset management plan to include all Township assets, to have targets set for levels of service performance measures, and to include a detailed financial strategy. The ongoing expansion of the AMP will ensure the Township's compliance with the July 1, 2024 and July 1, 2025 requirements of O. Reg. 588/17.

Beyond regulatory compliance, the Township should continue working on integrating asset management planning with other municipal financial and planning documents. Furthermore, the Township will need to establish processes for reviewing and updating assumptions underlying the asset management plan on a regular basis to keep the plan relevant and reliable.