Asset Management Plan – Core Assets

Township of King

Revision 1

January 10, 2022

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List of Acronyms and Abbreviations

Acronym	Full Description of Acronym
AC	Asbestos Cement
BCI	Bridge Condition Index
CI	Cast Iron
CP	Concrete Pipe
DI	Ductile Iron
G/S	Gravel Surface
HCB	High-Class Bituminous
HDPE	High-Density Polyethylene
IJPA	Infrastructure for Jobs and Prosperity Act
LCB	Low-Class Bituminous
PCI	Pavement Condition Index
PSAB	Public Sector Accounting Board
PVC	Polyvinyl Chloride
SA	Structural Adequacy
ULC%	Useful Life Consumption Percentage

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.

The Township of King (Township) retained Watson & Associates Economists Ltd. (Watson) to update the Township's 2016 Asset Management Plan. With this update, the intent is to bring the Township's asset management plan into compliance with the July 1, 2022 requirements of 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 assets included in this iteration of the asset management plan are the core municipal assets which fall into the following broad asset categories:

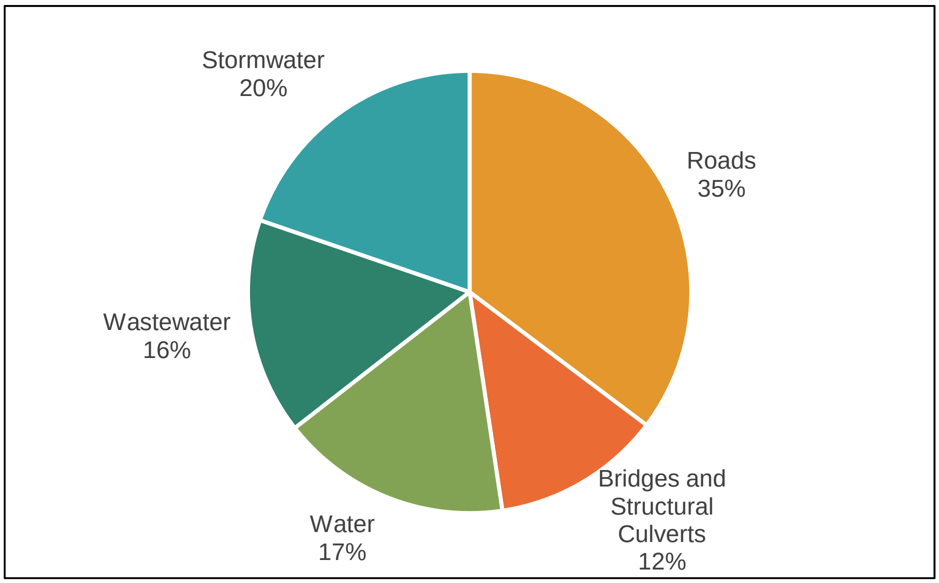
- Roads;
- Bridges and structural culverts;
- Water;
- Wastewater; and
- Stormwater

Core assets and their replacement costs are shown in Table 1-1. Figure 1-1 shows the distribution of replacement value by asset class. Roads account for more than a third of the replacement value (35%), followed by stormwater (20%), water (17%), wastewater (16%), and lastly, bridges and structural culverts (12%).

Table 1-1: Asset Classes and Replacement Cost

Asset Class	Replacement Cost
Roads	$209,760,000
Bridges and Structural Culverts	$73,400,000
Water	$100,020,000
Wastewater	$93,960,000
Stormwater	$117,320,000
Total	**$594,470,000**

Figure 1-1: Distribution of Replacement Value by Asset Class



The Township's goals and objectives with respect to asset management are identified in its Strategic Asset Management Policy, which was adopted by Council on June 24, 2019 via by-law #2019-068. 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 be responsive to the levels of service that are being achieved. 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 (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 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 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 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., 10 Year Paving Strategy and Pavement Management Plan Final Report, 2021 OSIM Bridge Inspection Report), 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 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 level of service outcomes.

5. Develop a financial summary of the expected costs arising from the lifecycle management strategy. The financial summary compares expected capital and operating expenses to current capital funding.

6. Document the 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

To comply with the July 1, 2024 and July 1, 2025 requirements of O. Reg. 588/17, this plan will need to be expanded to cover all assets, to have targets set for levels of service performance measures, and to include a detailed financial strategy. 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 is a snapshot in time and is based on a number of assumptions regarding expected lifecycles and future performance of assets, lifecycle intervention costs, among others. The Township will need to establish processes for reviewing and updating these assumptions on a regular basis to keep the plan relevant.

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.

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

2.2 Transportation

2.2.1 State of Local Infrastructure

The core assets that support the Township's transportation services are comprised of roads, bridges, and structural culverts. Other transportation assets such as signs and streetlights are not included in this plan because they are not considered core assets in O. Reg. 588/17.

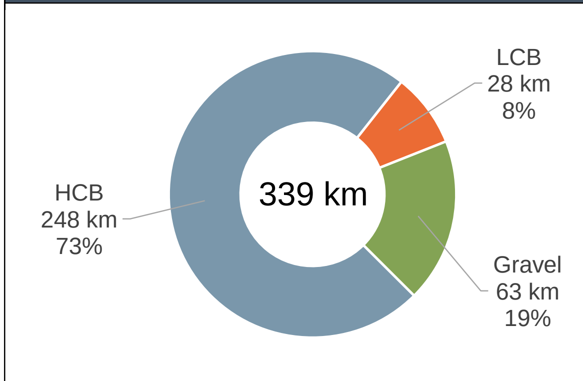
The road network consists of roads with various surface types, including high-class bituminous (HCB), low-class bituminous (LCB), and gravel (G/S). The estimated replacement cost of roads is $210 million. Table 2-1 provides a breakdown of the road network by surface type showing centreline length, average ages of the surface and base, and replacement cost. A visual rendering of the data presented in Table 2-1 is provided in Figure 2-1. A spatial illustration of the Township's road network and its extent is provided in Map 2-1.

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

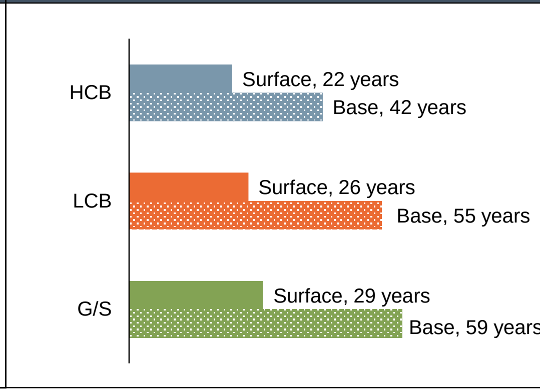
Surface Type	Centreline-Kilometres	Average Age – Surface (years)	Average Age – Base (years)	Replacement Cost (2021$)
HCB	247.7	22	42	$167,210,000
LCB	28.3	26	55	$17,130,000
Gravel	62.8	29	59	$25,420,000
Total	**338.8**	**25**	**49**	**$209,760,000**

Figure 2-1: Road Network Summary Information

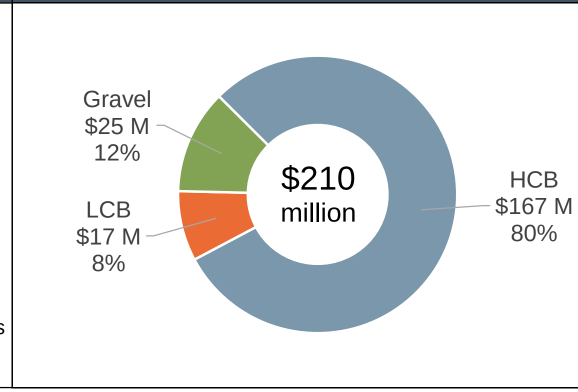
Road Network Length
(Centreline)



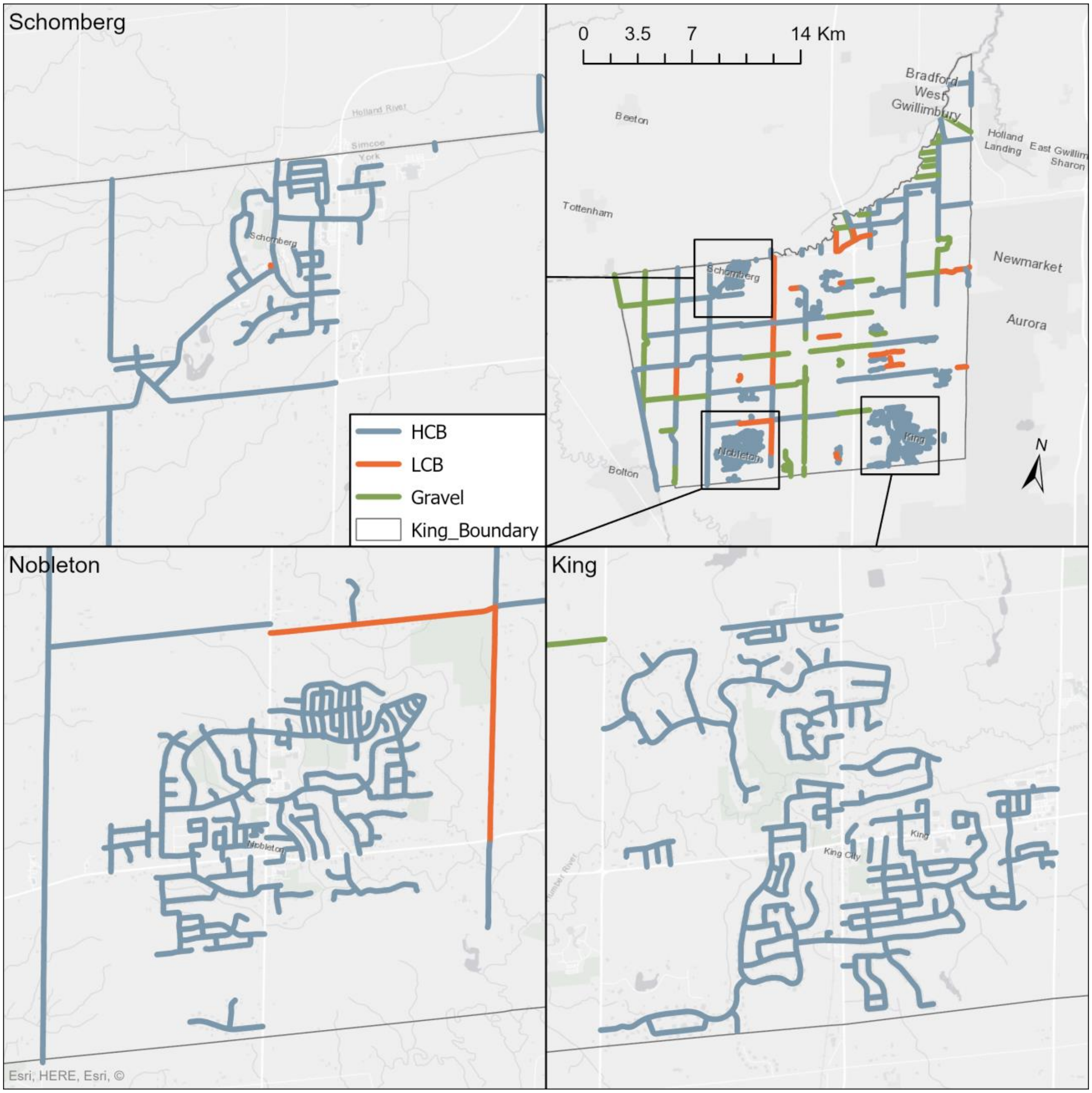
Average Age of Road Surface
(Years)



Replacement Cost
(2021$)



Map 2-1: Roads by Surface Type



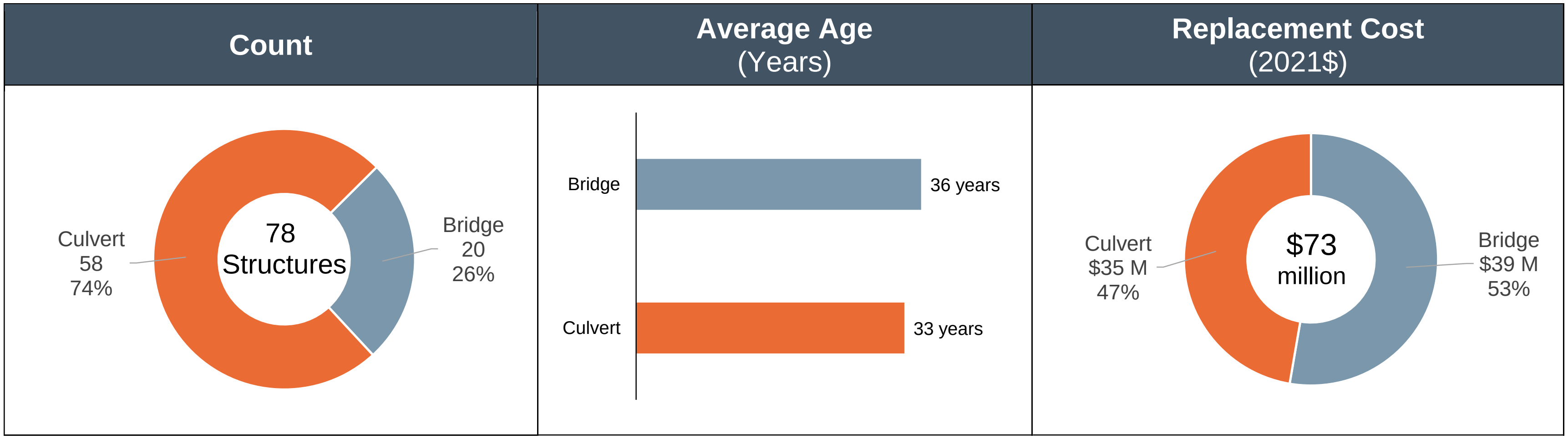
The Township has 20 bridges and 58 structural culverts with an estimated combined replacement cost of $73.4 million. The average age of bridges is 36 years and the average age of structural culverts is 34 years. Table 2-2 provides counts, average ages, and replacement costs for bridges and structural culverts.

Figure 2-2 illustrates the data in Table 2-2 visually. Map 2-2 provides a spatial illustration of the Township's bridges and structural culverts.

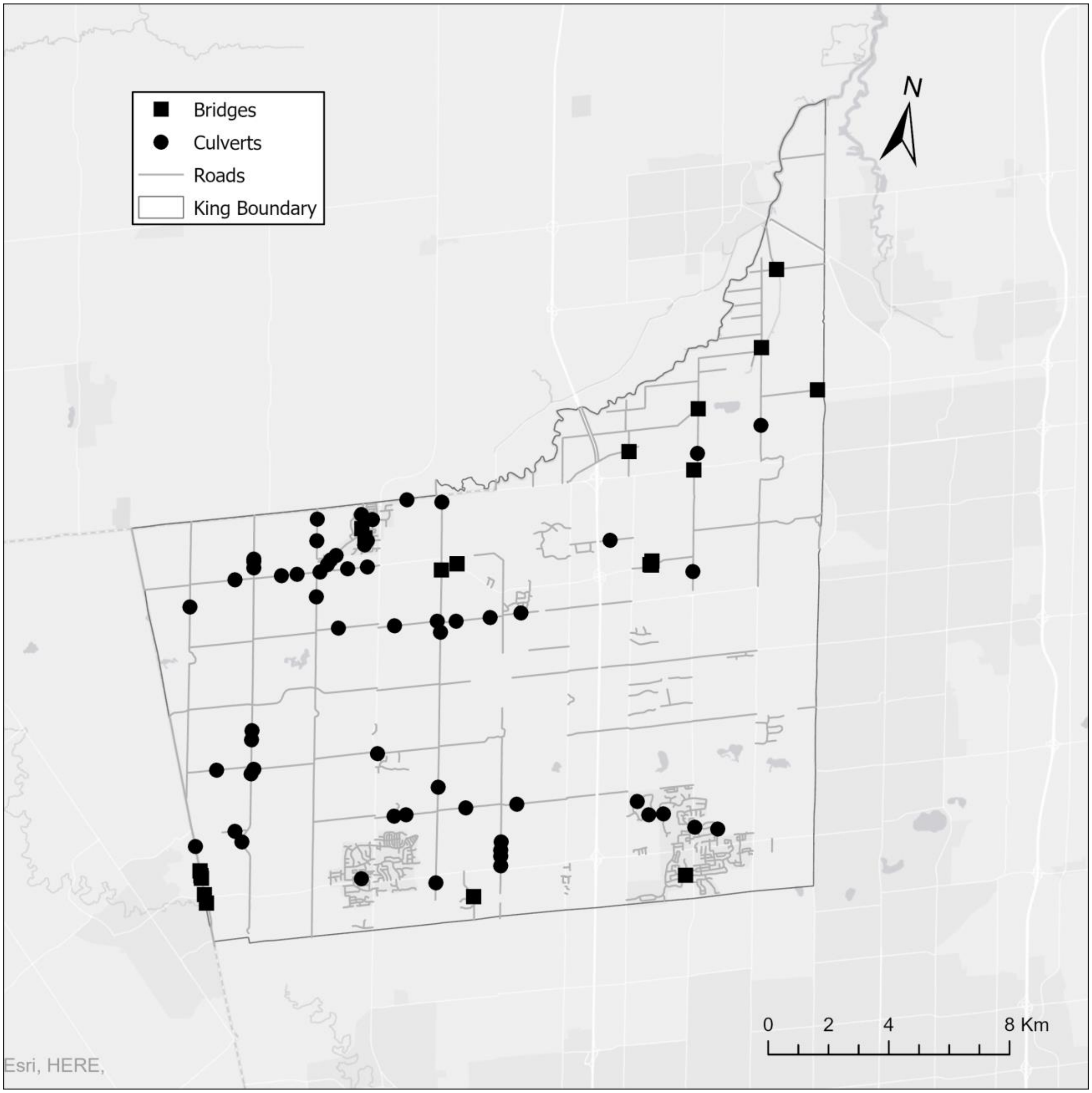
Table 2-2: Bridges and Structural Culverts – Summary of Count, Age, and Replacement Cost by Structure Type

Structure Type	Count	Average Age	Replacement Cost
Bridges	20	36	$38,680,000
Culverts	58	34	$34,730,000
Total	**78**	**35**	**$73,400,000**

Figure 2-2: Bridge and Structural Culvert Summary Information



Map 2-2: Bridges and Structural Culverts



2.2.2 Condition

In this AMP, road condition is reported using the Pavement Condition Index (PCI). PCI is measured on a scale from 0 to 100, with 100 being an asset in as new condition and 0 being a failed asset.

A comprehensive condition assessment of the Township's entire road network was completed in 2015 as part of the development of the Township's 2016 asset management plan. The 2015 assessment used Structural Adequacy (SA) as defined in the Inventory Manual for Municipal Roads (Ontario Ministry of Transportation, 1991). SA is a scale from 0 to 20, with 20 being an asset in as-new condition and 0 being a failed asset. While SA is not measured in the same way as the PCI, an approximate value for the PCI can be obtained by multiplying the SA by 5. This map scales the 0 to 20 SA scale to match the 0 to 100 PCI scale. Watson discussed this approach with Township staff and confirmed that it was an acceptable approximation to use in this AMP.

A portion of the roads were reassessed in 2020 as part of development of the 2020 10 Year Paving Strategy and Pavement Management Plan. Roads assumed by the Township since 2016 were assigned a PCI of 95, reflective of approximately 2 years of deterioration.

To better communicate the condition of the paved road network, the numeric condition ratings for paved roads have been segmented into qualitative condition states. Moreover, descriptions and photos of roads in these condition states are provided to better communicate the condition to the reader. Table 2-3 summarizes the various physical condition ratings and the condition state they represent for road assets.

Table 2-3: Road Condition States Defined with Respect to Pavement Condition Index

PCI Ranges	Condition State	Example Photo	Description[1]
85 < PCI ≤ 100	**Excellent**		A very smooth ride. Pavement is in excellent condition with few cracks.
70 < PCI ≤ 85	**Very Good**		A smooth ride with just a few bumps or depressions. The pavement is in good condition with frequent very slight or slight cracking.
55 < PCI ≤ 70	**Good**		A comfortable ride with intermittent bumps or depressions. The pavement is in fair condition with intermittent moderate and frequent slight cracking, and with intermittent slight or moderate alligatoring and distortion.
40 < PCI ≤ 55	**Fair**		An uncomfortable ride with frequent to extensive bumps or depressions. Cannot maintain the posted speed at lower end of the scale. The pavement is in poor to fair condition with frequent moderate cracking and distortion, and intermittent moderate alligatoring.

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

PCI Ranges	Condition State	Example Photo	Description[1]
25 < PCI ≤ 40	**Poor**		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 is in poor condition with moderate alligatoring and extensive severe cracking and distortion.
10 < PCI ≤ 25	**Very Poor**		The pavement is in poor to very poor condition with extensive severe cracking, alligatoring and distortion.
0 ≤ PCI ≤ 10	**End of Life**		

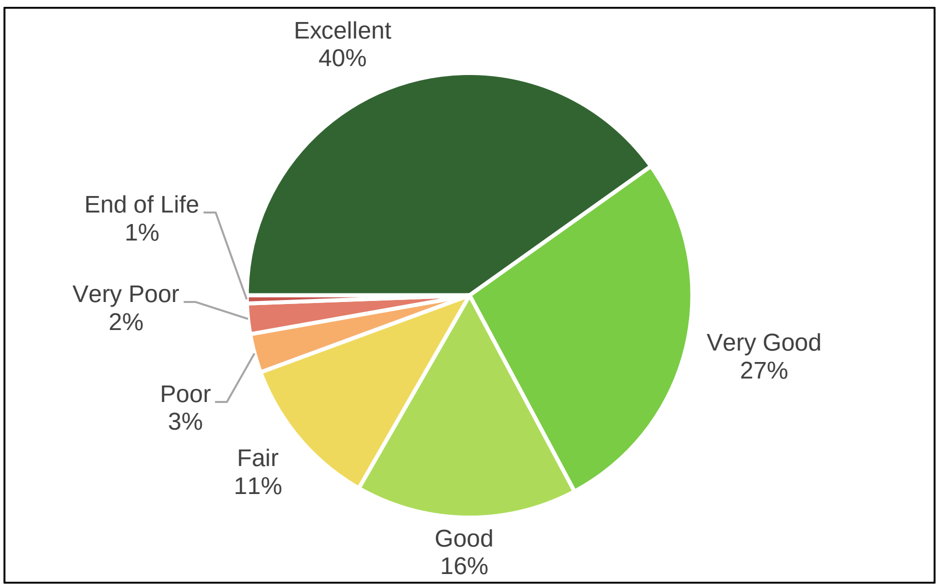
The condition of the Township's gravel roads was assessed by the Township's staff based on their experience and observations. Each segment of gravel roads was assigned a rating on a three-point scale: good (3), fair (2), poor (1). On average, gravel roads are in the Good condition state.

Table 2-4 shows the average condition of paved roads by surface type, which is weighted based on centreline-kilometres. On average, HCB roads are in the Very Good condition state, LCB roads are in the Good condition state. Figure 2-3 shows the overall distribution of paved road condition for the Township.

Table 2-4: Road Condition Analysis – Paved Roads

Road Surface	Centreline Kilometres	Condition (Weighted Average)	Average Condition State
HCB	247.7	78	**Very Good**
LCB	28.3	66	**Good**
Total	**276.0**	**77**	**Very Good**

Figure 2-3: Distribution of Paved Road Centreline Length by Condition State



The condition of the Township's bridges and structural culverts was assessed by R.J. Burnside & Associates Limited in 2021. The assessment was completed as part of the biennial inspections required by O. Reg. 104/97, following the Ontario Structure Inspection Manual (OSIM). Each bridge and 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 bridges and structural culverts have been segmented into qualitative condition states. Photographs and descriptions of these condition states are provided to better communicate the condition to the reader. Table 2-5 summarizes the BCI ratings and the condition state they represent.

Table 2-5: Examples and Descriptions of Bridge and Culvert Condition States

Condition State	Bridge Photos	Culvert Photos	Description[1]
70 < BCI ≤ 100 **Good**			A bridge with a BCI greater than 70 is generally considered to be in good to excellent condition, and repair or rehabilitation work is not usually required within the next five years. Routine maintenance, such as sweeping cleaning, and washing are still recommended.
50 < BCI ≤ 70 **Fair**			A bridge with a BCI between 50 and 70 is generally considered to be in good to fair condition. Repair or rehabilitation work recommended is ideally scheduled to be completed within the next five years. This is the ideal time to schedule major bridge repairs for larger and/or critical structures from an economic perspective. The most effective improvements in a structure's service life can be achieved by completing repairs while in this range.
0 < BCI ≤ 50 **Poor**			A bridge with a BCI rating of less than 50 is generally considered poor with lower numbers representing structures nearing the end of their service life. The repair or rehabilitation of these structures is ideally best scheduled to be completed within approximately one year. However, if it is determined that the replacement of the structure would be a more viable, practical, or economical solution than repairing the structure, the structure can be identified for continued monitoring and scheduled for replacement within a one to ten year range. The lower the BCI the more of a priority within the one to ten year range, the replacement becomes.

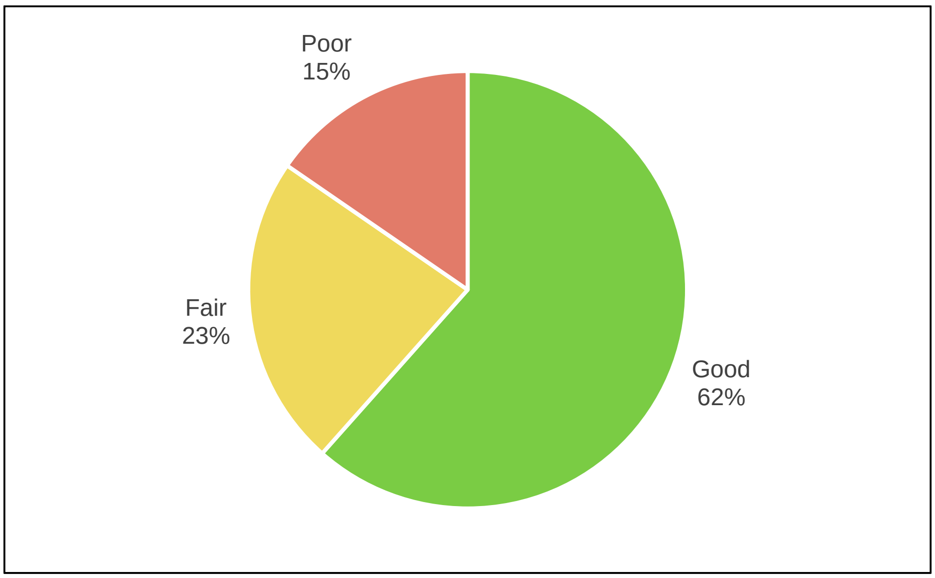
[1] Descriptions are from the Township's 2021 OSIM Bridge Inspection Report

The average BCI ratings and corresponding condition states for bridges and structural culverts are summarized in Table 2-6 below. On average, bridges are in the Good condition state and structural culverts are in the Fair condition state. However, approximately 15% of bridges and culverts are currently in the Poor condition state. The overall distribution of the Township's bridges and structural culverts by condition state is presented in Figure 2-4.

Table 2-6: Bridges and Structural Culverts Condition Analysis

Structure Type	Count	Average Condition	Average Condition State
Bridges	20	76.0	Good
Culverts	58	67.8	Fair
Total	**78**	**69.9**	**Fair**

Figure 2-4: Distribution of Bridges and Structural Culverts by Condition State



2.2.3 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. A levels of service analysis defines the current levels of service that will be tracked over time. In future iterations of the asset management plan, targets will be set for the technical levels of service.

There are prescribed levels of service reporting requirements under O. Reg. 588/17 for some transportation assets (i.e., roads, bridges and culverts). Table 2-7 and Table 2-8 include the prescribed technical levels of service along with additional levels of service developed by the Township. The levels of service measures were developed through identification of service aspects that are of interest to the users of transportation assets.

The tables are structured as follows:

- The Service Attribute headings and columns indicate the high-level attribute being addressed;
- The Community Levels of Service column in Table 2-7 explains the Township's intent in plain language and provides additional information about the service being provided;
- The Performance Measure column in Table 2-8 describes the performance measure(s) connected to the identified service attribute; and
- The 2020 Performance column in Table 2-8 reports current performance for the performance measure.

Table 2-7: Community Levels of Service – Roads and Bridges

Service Attribute	Community Levels of Service
Scope	The Township's transportation assets enable the movement of people and goods within the Township. The assets also support transient traffic passing through the Township. In addition to passenger vehicles, the Township's transportation assets also support public transit, commercial truck traffic, movement of agricultural equipment, products and animals, and reliable emergency vehicle access to all areas of the Township. Transportation assets also support other transportation modes such as walking, cycling, and horseback-riding. The assets support special events such as pilgrimages and filming.
	The scope of the Township's transportation assets is illustrated by Map 2-1 and Map 2-2. The maps show the geographical distribution of transportation assets.
Quality	The Township strives to maintain road and bridge surfaces to a level that supports comfortable passage of vehicles.
	Photos of roads, bridges and structural culverts in different condition states are shown in Table 2-3 and Table 2-5. A general description of how each condition state may affect the use of these assets is also provided in these tables.

Table 2-8: Technical Levels of Service – Roads and Bridges

Service Attribute	Performance Measure	2020 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	0.31 km/km^2
	Number of lane-kilometres of local roads as a proportion of square kilometres of land area of the Township	1.72 km/km^2
	Percentage of bridges in the Township with loading or dimensional restrictions	9%
	Percentage of bridges in the Township with loading restrictions due to poor condition	0%
Quality	For paved roads in the Township, the average pavement condition index value	77
	Lane-kilometres (and %) of paved roads in condition state Fair or better (PCI > 40)	521.0 (94%)
	For unpaved roads in the Township, the average surface condition	Good
	Lane-kilometres of gravel roads as a percentage of total lane-kilometres of roads	18.5%
	For bridges in the Township, the average bridge condition index value	76.0
	Number (and %) of bridges in Poor condition state (BCI < 50)	2 (9.1%)
	For structural culverts in the Township, the average bridge condition index value	67.8
	Number (and %) of culverts in Poor condition state (BCI < 50)	10 (17.9%)
	Lane-kilometres of road assessed for condition in the last five years as a percentage of total lane-kilometres of roads	100%

2.3 Water Distribution

2.3.1 State of Local Infrastructure

The water system provides potable water for residential and business consumption, as well as maintenance operations, recreational facilities, and firefighting. The Township's water service operates under a two-tiered system. The Region of York is responsible for water supply, transmission mains, storage facilities, and booster pumping stations. The Township is responsible for operation and maintenance of local distribution networks. There are large municipal networks in King City, Nobleton, and Schomberg and one small municipal residential network in Ansnorveldt. The water system serves primarily residential customers but also some light commercial and industrial customers. King City is supplied by the York-Peel feeder main from Lake Ontario. The other networks are supplied by wells within the respective communities. The Township's water distribution system is comprised of approximately 117.8 km of mains with an estimated replacement cost of approximately $100.0 million. Asset summary information for the Township's water distribution system, including length, average age, and replacement cost, is presented in Table 2-9. A spatial illustration of the Township's water distribution system and its extent is provided in Map 2-3.

Table 2-9: Water System – Summary of Length, Age, and Replacement Cost

Asset	Main Length (km)	Average Age (Years)	Replacement Cost (2021$)
Water mains	117.8	22.1	$100,020,000

Map 2-3: Water Mains

2.3.2 Condition

The condition of the Township's water mains has not been directly assessed through a physical condition assessment. For the purposes of this asset management plan, water main age has been used as a proxy for the condition state. The measure used is the Useful Life Consumption Percentage (ULC%) based on each water main's age and the average life expectancy for the water main, based on industry best practices and discussions with the Township's staff. A brand-new water main would have a ULC% of 0%, indicating that zero percent of the water main's life expectancy has been utilized. On the other hand, a water main that has reached its life expectancy would have a ULC% of 100%. It is possible for water mains to have a ULC% greater than 100%, which occurs if a water main has exceeded its typical life expectancy but continues to be in service. This is not necessarily a cause for concern; however, it must be recognized that water mains that are near or beyond their typical life expectancy are expected to require replacement in the near term.

To better communicate the condition of the network, the ULC% ratings have been segmented into qualitative condition states as summarized in Table 2-10.   The scale is designed such that if water mains are replaced around the expected useful life, they would have a rating of Fair at time of replacement.[1] The rating of Fair extends to 140% of expected useful life. Beyond 140% of useful life, the probability of failure is assumed to have increased to a point where performance would be characterized as Poor and eventually Very Poor.

Table 2-10: Water Asset Condition States Defined with Respect to ULC%

ULC%	Condition State
0% ≤ ULC% ≤ 45%	**Very Good**
45% < ULC% ≤ 90%	**Good**
90% < ULC% ≤ 140%	**Fair**
140% < ULC% ≤ 200%	**Poor**
200% < ULC%	**Very Poor**

The average condition state for the water mains is presented below in Table 2-11. The table shows that, on average, the water mains are in the Very Good condition state.

[1] Scale is based on guidance in the International Infrastructure Management Manual (Institute of Public Works Engineering Australasia, 2015).

Table 2-11: Water Main Condition Analysis – Age Based

Water System	Main Length (km)	Average ULC%	Average Condition State
Mains	117.8	25%	**Very Good**

2.3.3 Current Levels of Service

The levels of service currently provided by the Township's water system are, in part, a result of the state of local infrastructure identified above. A levels of service analysis defines the current levels of service that will be tracked over time. In future iterations of the asset management plan, targets will be set for the technical levels of service.

Water assets have prescribed levels of service reporting requirements under O. Reg. 588/17. These requirements include levels of service reporting at 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 customers' expectations with respect to the scope, reliability, affordability, and efficiency of the water systems. Technical levels of service describe these aspects of the Township's water system through performance measures that can be quantified and evaluated. In the future, these performance measures can be used to assess how effectively the Township is achieving its established targets.

Table 2-12 and Table 2-13 present the current levels of service for the water system. They include the requirements mandated by O. Reg. 588/17 and additional performance measures of interest to the Township.

Table 2-12: Community Levels of Service – Water Distribution

Service Attribute	Community Levels of Service
Scope	The water system provides potable water for residential and business consumption, as well as maintenance operations, recreational facilities, and firefighting. Fire flow is available to all properties in King City, Nobleton, and Schomberg.
	The scope of the Township's water distribution system is illustrated by Map 2-3. The map shows the geographical distribution of municipal water system within the Township.
Reliability	The water distribution system is managed with the goal of providing safe and reliable delivery of water, minimizing service interruptions and occurrences of adverse water quality events (measured by occurrences of boil water advisories).
	The Township endeavors to maintain acceptable water pressure for all customers.
Quality	The water system supplies potable water with acceptable odor, taste, and appearance.
Efficiency	The Township strives to deliver water services efficiently and sustainably.

Table 2-13: Technical Levels of Service – Water Distribution Service

Service Attribute	Performance Measure	2020 Performance
Scope	Percentage of properties connected to the municipal water system	46%
	Percentage of properties where fire flow is available	46%
Reliability	The number of connection-days per year where a boil water advisory notice is in place compared to the total number of properties connected to the municipal water system	0 connection-days/ connection
	The number of connection-days per year lost due to water main breaks compared to the total number of properties connected to the municipal water system	0.0083 connection-days/ connection
	Percentage of fire hydrants with adequate fire flow	100%
Quality	Number of confirmed water pressure complaints received	60
	Number of water colour complaints received	27
	Number of water taste/odour complaints received	9
	Number of adverse water quality incidents	7
Efficiency	Percentage of water loss (% of total water purchased form York Region)	27%
	Average daily residential water consumption per capita	176 litres/day

2.4 Wastewater Collection

2.4.1 State of Local Infrastructure

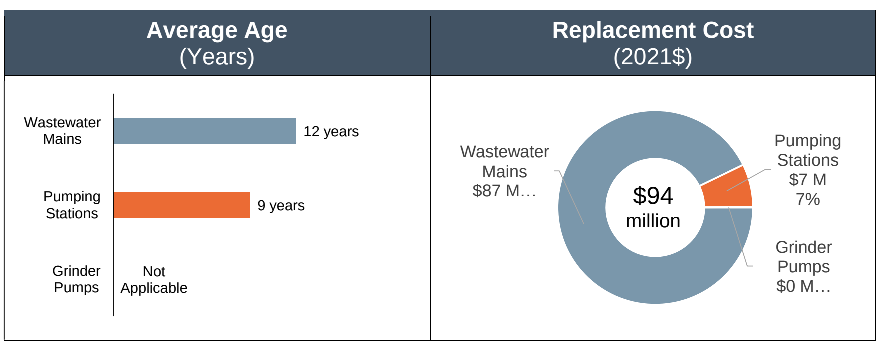
The Township's wastewater service operates under a two-tiered system. The Region of York is responsible for wastewater treatment and trunk collection systems. The Township is responsible for operation and maintenance of local collection networks. King City, Nobleton and Schomberg have municipal sewer connections within the current serviced areas. All water customers have wastewater service except for water customers in Ansnorveldt. Nobleton and Schomberg have individual treatment plants for each system operated by York Region. King City is connected to the York-Durham system.

The wastewater collection system that the Township is responsible for is comprised of approximately 99.1 km of mains, eight pumping stations, and 14 grinder pumps. The 2021 replacement cost of the system is approximately $94.0 million. Asset summary information for the Township's wastewater system, including quantities, average age, and replacement cost, is presented in Table 2-14. A visual rendering of the data presented in these tables is provided in Figure 2-5. A spatial illustration of the Township's wastewater collection system and its extent is provided in Map 2-4.

Table 2-14: Wastewater Systems – Replacement Costs (2021$)

Asset Class	Quantity	Units	Average Age (years)	Replacement Cost (2021$)
Wastewater Mains	99.1	Km	11.7	$87,170,000
Pumping Stations	8	Count	8.8	$6,765,000
Grinder Pumps	14	Count	Not Available	$28,000
Total			**11.5**[1]	**$93,963,000**

Figure 2-5: Wastewater Collection Summary Information



[1] Average does not include grinder pumps because age data is not available.

Map 2-4: Wastewater Assets

2.4.2 Condition

The condition of the Township's wastewater assets has not been directly assessed through a physical condition assessment. For the purposes of this asset management plan, ULC% has been used as a proxy for the condition state for the mains and pumping stations in the same way as for water mains. Refer back to Table 2-10 to see how the ULC% ratings have been segmented into qualitative condition states.

Average condition states for the wastewater mains and pumping stations are presented in Table 2-15. The table shows that, on average, all assets are in the Very Good condition state. ULC% is not reported for grinder pumps because age information is not available.

Table 2-15: Wastewater Main Condition Analysis – Age Based

Wastewater System	Average ULC%	System - Condition State
Wastewater Mains	13%	**Very Good**
Pumping Stations	16%	**Very Good**
Total	13%	**Very Good**

2.4.3 Current Levels of Service

The levels of service currently provided by the Township's wastewater systems are, in part, a result of the state of local infrastructure identified above. A levels of service analysis defines the current levels of service that will be tracked over time. In future iterations of the asset management plan, targets will be set for the technical levels of service.

Wastewater assets have prescribed levels of service reporting requirements under O. Reg. 588/17. These requirements include levels of service reporting at 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 customers' expectations with respect to the scope, reliability, affordability, and efficiency of the wastewater systems. Technical levels of service describe these aspects of the Township's wastewater systems through performance measures that can be quantified and evaluated. These performance measures can be used to assess how effectively a municipality is achieving its established targets.

Table 2-16 and Table 2-17 present the current levels of service for wastewater. They include the requirements mandated by O. Reg. 588/17 and additional performance measures of interest to the Township.

Table 2-16: Community Levels of Service – Wastewater Collection Service

Service Attribute	Community Levels of Service
Scope	The wastewater collection system serves the communities of King City, Nobleton, and Schomberg. The scope of the wastewater collection system is illustrated by Map 2-4. The map shows the geographical distribution of municipal wastewater mains (including gravity and force mains).
Reliability	The wastewater collection system is separated, meaning that sanitary and stormwater flows are carried in different mains with different destinations. Despite this, stormwater can enter the wastewater system through numerous sources. The Township is working to reduce the amount of stormwater entering the wastewater system. Through York Region, a pick-hole plugging program was conducted and completed to attempt to reduce surface infiltration. Some rehabilitation work was done in Nobleton a few years ago in response to an inflow and infiltration study by Civica. The Township is in the process of developing other programs such as wet CCTV inspection, sump pump diversions and possibly smoke testing.

Table 2-17: Technical Levels of Service – Wastewater Collection Service

Service Attribute	Performance Measure	2020 Performance
Scope	Percentage of properties connected to the municipal wastewater systems	43%
Reliability	The number of connection-days lost per year due to wastewater backups compared to the total number of properties connected to the municipal wastewater collection systems	0.00081 Connection-days/connection
	Number of wastewater main breaks	0
	Percentage of the wastewater mains flushed and inspected via CCTV in the past 7 years	12%

2.5 Stormwater Collection

2.5.1 State of Local Infrastructure

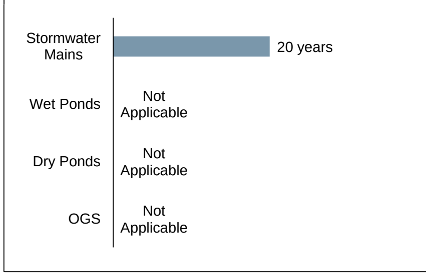
The stormwater management system provides for the collection of stormwater in order to protect properties and roads from flooding, to manage the discharge rate into the environment, and to remove contaminants.

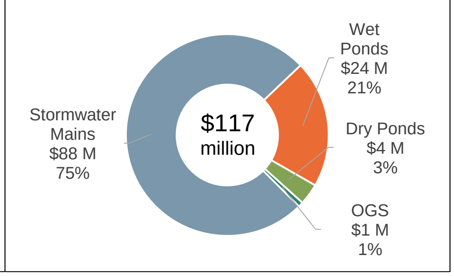
The stormwater collection system that the Township is responsible for is comprised of approximately 89.5 km of mains, 24 wet ponds, four dry ponds, and 13 Oil and Grit Separators (OGS). The 2021 replacement cost of the system is approximately $117.3 million. Asset summary information for the Township's stormwater system, including quantities, average age, and replacement cost, is presented in Table 2-18. The distribution of replacement cost by asset class is shown in Figure 2-6. A spatial illustration of the Township's stormwater collection system and its extent is provided in Map 2-5.

Table 2-18: Stormwater System – Summary of Quantity, Age, and Replacement Cost

Asset Class	Quantity	Units	Average Age	Replacement Cost (2021$)
Stormwater Mains	89.5	Km	20.1	$88,410,000
Wet Ponds	24	Count	Not Available	$24,000,000
Dry Ponds	4	Count	Not Available	$4,000,000
OGSs	13	Count	Not Available	$910,000
Total				**$117,320,000**

Figure 2-6: Stormwater Collection Summary Information

Average Age (Years)	Replacement Cost (2021$)




Map 2-5: Stormwater Mains

2.5.2 Condition

The condition of the Township's stormwater mains has not been directly assessed through a physical condition assessment. For the purposes of this asset management plan, stormwater main ULC% has been used as a proxy for the condition state in the same way as for water mains. Refer back to Table 2-10 to see how the ULC% ratings have been segmented into qualitative condition states.

Average condition states for the stormwater mains of the stormwater systems are presented below in Table 2-15. The table shows that, on average, stormwater mains are in a Very Good condition state.

Table 2-19: Stormwater Main Condition Analysis – Age Based

Water System	Main Length (km)	Average ULC%	Condition State
King City	40.3	22%	**Very Good**
Nobleton	35.9	21%	**Very Good**
Schomberg	10.5	24%	**Very Good**
Other/Rural	2.8	39%	**Very Good**
Total	**89.5**	**22%**	**Very Good**

The condition of the stormwater ponds and OGSs has not been assessed and cannot be estimated based on ULC% because the age data is incomplete.

2.5.3 Current Levels of Service

The levels of service currently provided by the Township's stormwater system are, in part, a result of the state of local infrastructure identified above. A levels of service analysis defines the current levels of service that will be tracked over time. In future iterations of the asset management plan, targets will be set for the technical levels of service.

Stormwater assets have prescribed levels of service reporting requirements under O. Reg. 588/17. These requirements include levels of service reporting at 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 customers' expectations with respect to the scope and reliability of the stormwater system. Technical levels of service describe these aspects of the Township's stormwater system through performance measures that can be quantified and evaluated. These performance measures can be used to assess how effectively a municipality is achieving its established targets.

Table 2-20 and Table 2-21 present the current levels of service for stormwater. They include the requirements mandated by O. Reg. 588/17 and an additional performance measure of interest to the Township.

Table 2-20: Community Levels of Service – Stormwater Collection Service

Service Attribute	Community Levels of Service
Scope	The stormwater management system provides for the collection of stormwater in order to protect properties and roads from flooding, to manage the discharge rate into the environment, and to remove contaminants.
	The stormwater collection system primarily serves the communities of King City, Nobleton, and Schomberg. There are some smaller works in rural areas. The scope of the Township's stormwater system is illustrated by the map in Figure 4. The map shows the geographical distribution of municipal stormwater mains.
Capacity	The stormwater management system is resilient to 5-year storms and ensures most properties in serviced areas are resilient to 100-year storms.
Reliability	The Township inspects and maintains the stormwater system to ensure that it functions as intended.

Table 2-21: Technical Levels of Service – Stormwater Collection Service

Service Attribute	Performance Measure	2020 Performance
Scope	Percentage of properties in the Township resilient to a 100-year storm	55%
	Percentage of the municipal stormwater management system resilient to a 5-year storm	94%
Capacity	Number of road closures due to storm overflows	Not Available
Reliability	Percentage of catch basins cleaned out at least once within previous three years	68%
	Number of stormwater ponds with sedimentation level within 50% of rated capacity	1
	Percentage of the stormwater system flushed and inspected via CCTV in the past 7 years	0%

2.6 Population and Employment Growth

Based on the Township's 2019 Official Plan, in 2016 the Township had a population of approximately 25,400. The Township's population is anticipated to reach 34,900 by 2031.

This population growth is expected to result in incremental service demands that may impact the current level of service. To understand service pressures resulting from growth, the Township has undertaken a number of master planning studies which identify the need for new infrastructure and infrastructure upgrades. These growth-related needs are summarized in the Township's 2020 Development Charges Study and are funded through development charges imposed on new development. Utilizing development charges helps ensure that the effects of future population and employment growth do not increase the cost of maintaining levels of service for existing tax and rate payers.

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 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 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. The Township did detailed work on lifecycle management strategies as part of developing its 2016 asset management plan. These lifecycle management strategies have been reviewed and have been adopted in this asset management plan. The unit costs have been updated to 2021 using costing data where available and the non-residential building construction price index otherwise.

Asset management plans must include a ten-year capital plan that forecasts the lifecycle activities resulting from the lifecycle management strategy. Where required data is available, the lifecycle management strategies have been modelled in Assetic Predictor, an asset management application from Dude Solutions. The software forecasts when lifecycle activities occur and their expected impact on asset condition. What follows are the lifecycle management strategies for all assets contained within this asset management plan, with each section focusing on an individual service.

3.2 Transportation

This section presents lifecycle management strategies for roads, bridges, and structural culverts, beginning with a generalized lifecycle model for roads. Gravel roads do not

[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.

require capital investments because they are maintained indefinitely by operating activities alone. The strategy for HCB roads is to do two resurfacings over the life of a section and then reconstruct it to restore it to as-new condition. If a resurfacing cannot be done when needed because of funding constraints, bituminous surface treatments and slurry seals can be used as holding strategies. The strategy for LCB roads is to upgrade them to HCB when the surface condition requires action to be taken. Table 3-1 and Table 3-2 provide the detailed assumptions underlying the lifecycle models used to forecast future lifecycle activities, their cost, and expected road condition.

Table 3-1: Cost of Lifecycle Treatments – Roads

Treatment	Cost/m²
R – Resurface (mill and pave or pulverize and pave)	$21.48
BST - Bit Surface Treatment	$30.83
SS - Slurry Seal	$22.22
REC Urban - Reconstruction	$103.10
REC Rural - Reconstruction	$80.23
Convert LCB to HCB - Urban	$103.10
Convert LCB to HCB - Rural	$80.23
HCB Urban – Full-depth Construction	$170.93
HCB Rural – Full-depth Construction	$148.06
LCB – Full-depth Construction	$95.32
Gravel – Full-depth Construction	$67.83

Table 3-2: Assumptions for Lifecycle Treatments – Roads

Treatment	Max #	Criteria	Effect
R – Resurface (mill and pave or pulverize and pave)	2	HCB road surface; PCI between 36 and 55	Increase PCI to 95
BST - Bit Surface Treatment	1	HCB road; At most 1 prior resurfacing; PCI between 36 and 55	Increase PCI by 20
SS - Slurry Seal	1	HCB road; PCI between 0 and 35	Increase PCI by 20
REC Urban - Reconstruction		Urban HCB road; PCI between 0 and 35	Increase PCI to 100
REC Rural - Reconstruction		Rural HCB road; PCI between 0 and 35	Increase PCI to 100
Convert LCB to HCB - Urban		Urban LCB road; PCI between 0 and 35	Increase PCI to 100
Convert LCB to HCB - Rural		Rural LCB road; PCI between 0 and 35	Increase PCI to 100

With these assumptions, the average annual lifecycle cost over the next 100 years is $3,740,000. Figure 3-1 shows the forecasted distribution of these costs.

Figure 3-1: Distribution of Costs of Forecasted Lifecycle Activities for Roads – No Funding Constraint (2021$)

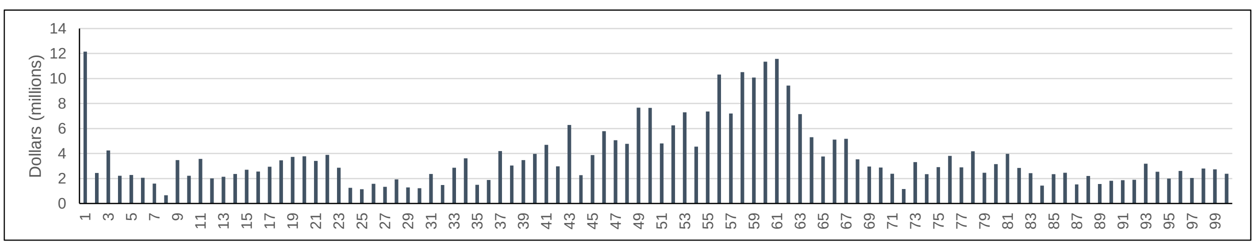


Figure 3-2 and Figure 3-3 show how condition evolves over time if funding is constrained to the 100-year average of the unconstrained scenario. With this funding level, average PCI is maintained between 65 and 80.

Figure 3-2: Condition Profile Forecast for Roads (Constrained) - $3.74 Million (2021$)

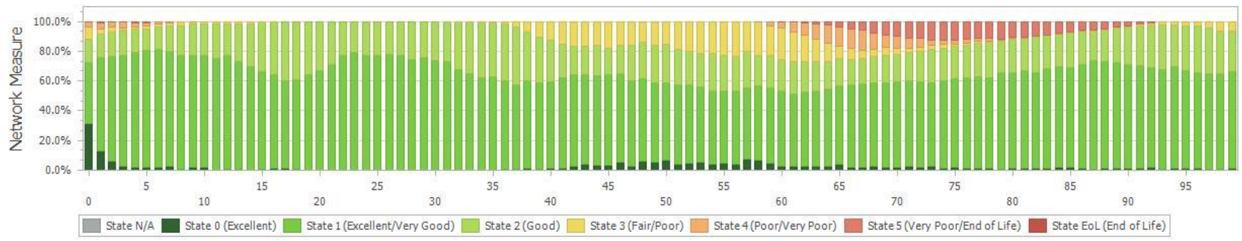
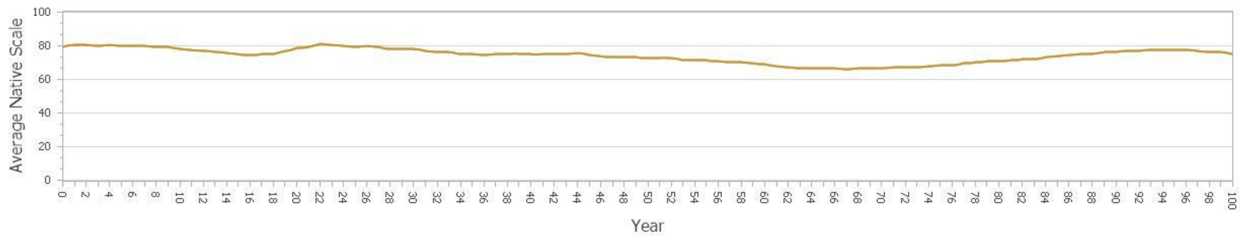


Figure 3-3: Forecast of Average PCI for Roads (Constrained) - $3.74 Million (2021$)



Expenditures for roads in the Township's current 10-year capital plan average $2,680,000 per year. Figure 3-4 and Figure 3-5 show how condition evolves over time if funding is constrained to this level over the next 100 years, adjusting only for inflation. Average PCI falls as low as 47 for several years, recovering to 51 by the end of the forecast period.

Figure 3-4: Condition Profile Forecast for Roads (Constrained) - $2.68 Million (2021$)

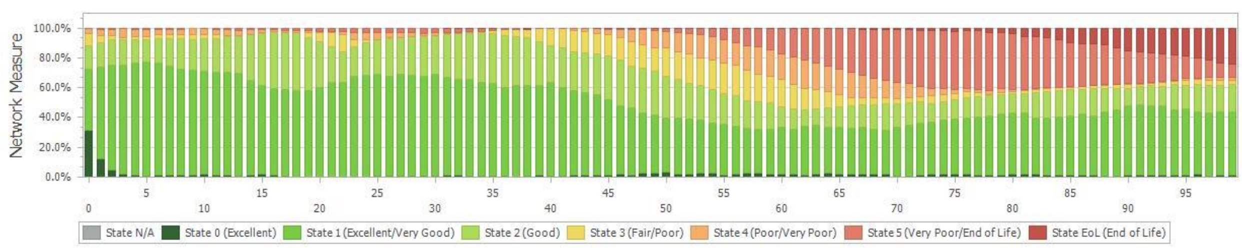
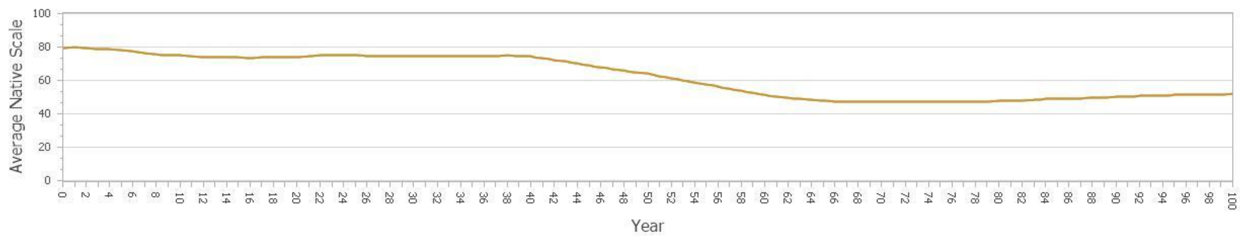


Figure 3-5: Forecast of Average PCI for Roads (Constrained) - $2.68 Million (2021$)



Moving on to bridges and structural culverts, minor rehabilitation, major rehabilitation, and reconstruction have been included in the generalized lifecycle model for these assets. For all structures, the sequence of lifecycle events is: minor rehabilitation, major rehabilitation, minor rehabilitation, and finally reconstruction.

The replacement cost estimates used for bridges and structural culverts are from the 2021 OSIM Bridge Inspection Report. These estimates include design and contingency costs. Table 3-3 and Table 3-4 provide the detailed assumptions used to forecast future lifecycle activities, their cost, and expected road condition. Costs for lifecycle activities are expressed as percentages of replacement costs in Table 3-3.

Table 3-3: Cost of Lifecycle Treatments – Bridges and Structural Culverts

Lifecycle Activity	Bridge (Vehicle)	Bridge (Pedestrian)	Culvert (Vehicle)
Minor Rehabilitation	12.5%	17.9%	10.4%
Major Rehabilitation	37.5%	53.6%	31.3%
Reconstruction	100%	100%	100%

Table 3-4: Assumptions for Lifecycle Treatments – Bridges and Structural Culverts

Treatment	Max #	Criteria	Effect
Minor Rehabilitation	2	BCI from 71 to 80 for first treatment and from 41 to 60 for second treatment	Increase BCI by 17 for first treatment and by 10 for second treatment
Major Rehabilitation	1	BCI from 61 to 70	Increase BCI by 10
Replacement		BCI from 0 to 40	New

With these assumptions, the average annual lifecycle cost over the next 100 years is $1,820,000. Figure 3-6 shows the forecasted distribution of these costs.

Figure 3-6: Distribution of Costs of Forecasted Lifecycle Activities for Bridges and Structural Culverts – No Funding Constraint (2021$)

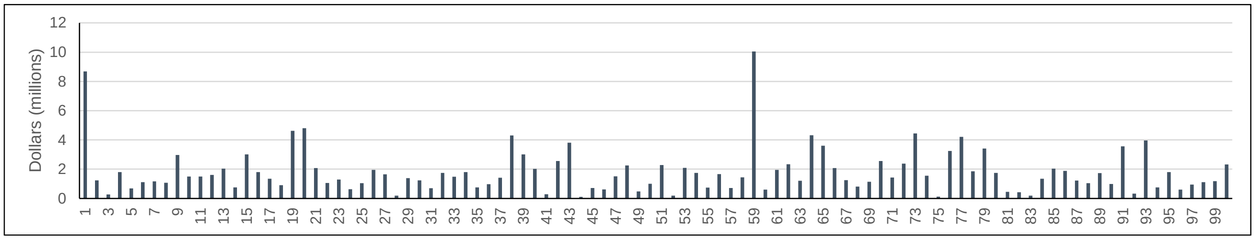


Figure 3-7 and Figure 3-8 show how condition evolves over time if funding is constrained to the 100-year average of the unconstrained scenario. With this funding level, average BCI is maintained between 70 and 81.

Figure 3-7: Condition Profile Forecast for Bridges and Structural Culverts (Constrained) - $1.82 Million (2021$)

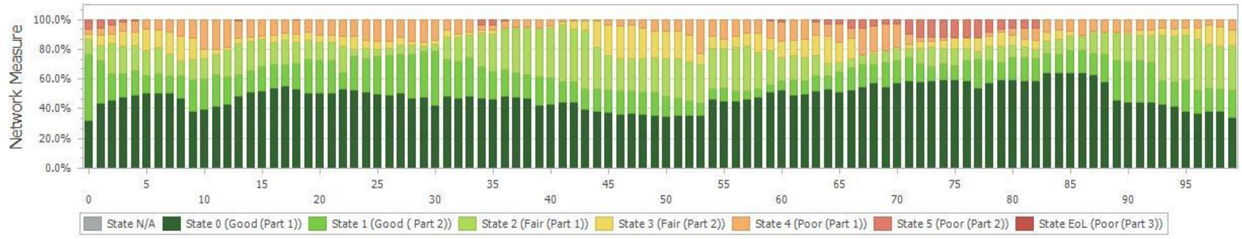
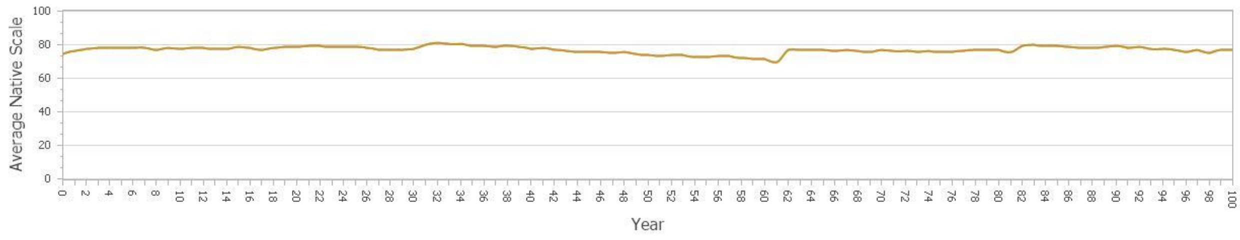


Figure 3-8: Forecast of Average BCI for Bridges and Structural Culverts (Constrained) - $1.82 Million (2021$)



Expenditures for bridges and structural culverts in the Township's current 10-year capital plan average $1,430,000 per year. Figure 3-9 and Figure 3-10 show how condition evolves over time if funding is constrained to this level over the next 100 years, adjusting only for inflation. Average BCI falls to 61 by the end of the forecast period.

Figure 3-9: Condition Profile Forecast for Bridges and Structural Culverts (Constrained) - $1.43 Million (2021$)

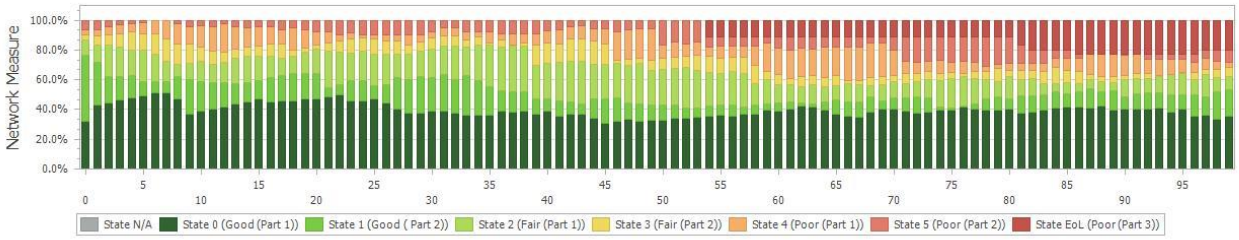
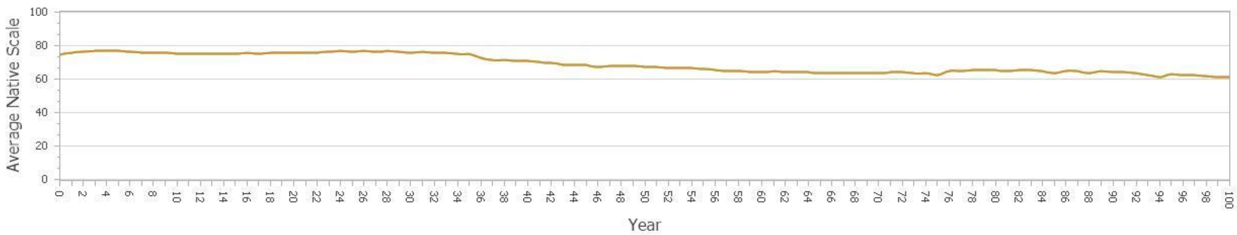


Figure 3-10: Forecast of Average BCI for Bridges and Structural Culverts (Constrained) - $1.43 Million (2021$)



3.3 Water

3.3.1 Lifecycle Activities

The Township's current plan is to replace water mains at the end of their useful lives. With the exception of copper mains, mains are replaced with PVC regardless of the current material. Copper mains are replaced like-for-like. Hydrants, valves, sample stations, and laterals are replaced together with the mains. The cost of replacing these components is included in the replacement cost of the main. The replacement cost of water mains is shown in Table 3-5. Table 3-6 presents the lifespans used for various water main materials.

Table 3-5: Watermain Replacement Costs per Metre (2021$)

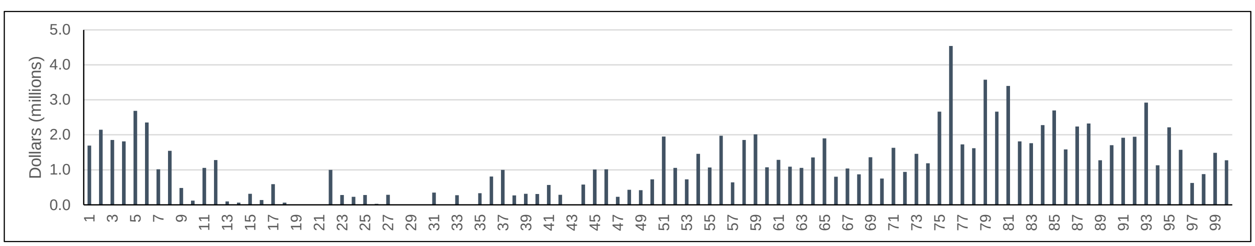
Main Material and Size Range	Cost / m
Copper <=50 mm	$360
PVC <=100 mm	$415
PVC 100 - 300 mm	$850
PVC 400 mm	$1,320
PVC 600 mm	$1,805

Table 3-6: Lifespan of Water Main by Material

Water Main Material	Lifespan (Years)
Ductile Iron[1]	48
Unknown	60
Cast Iron, AC, DI, CP, Copper	75
HDPE, PVC	90

With these assumptions, the average annual lifecycle cost over the next 100 years for water mains is $1,150,000. Figure 3-11 shows the forecasted distribution of these costs.

Figure 3-11: Distribution of Costs of Forecasted Lifecycle Activities for Water Mains – No Funding Constraint (2021$)



[1] The lifespan of ductile iron mains was reduced to 48 years from 60 years used in the 2016 asset management plan to reflect the fact that much of the ductile iron mains are being replaced over the next ten years.

Expenditures for water mains in the Township's current 10-year capital plan average $1,780,000 per year, which is higher than the forecasted 100-year average. Figure 3-12 and Figure 3-13 show how condition of water mains evolves over time if funding is constrained to the average of the 10-year capital plan for the first 10 years and then the 100-year average of the unconstrained scenario for the rest of the forecast period, adjusting only for inflation. With these funding levels, average ULC% increases to 63% and then starts a gradual decline to 58% at the end of the forecast period.

Figure 3-12: Condition Profile Forecast for Water Mains (Constrained) - $1.78 Million Years 1 to 10; $1.15 Million Years 11 to 100 (2021$)

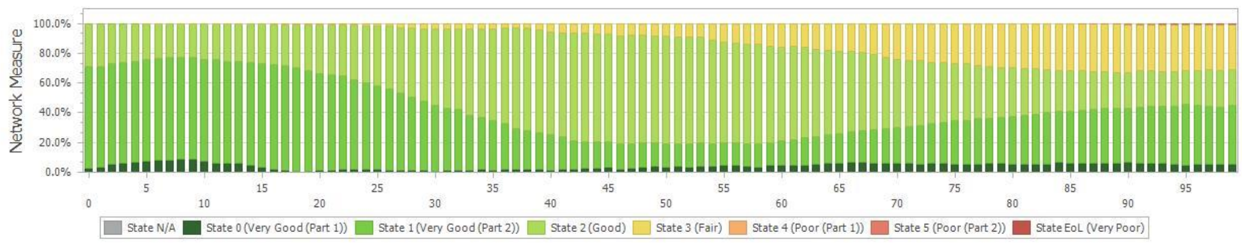
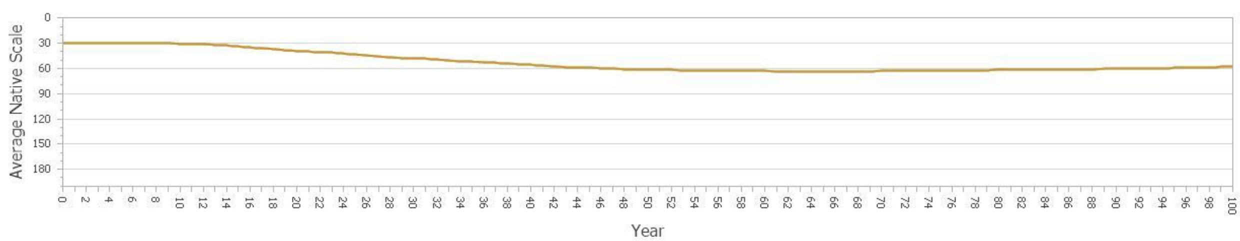


Figure 3-13: Forecast of Average ULC% for Water Mains (Constrained) - $1.78 Million Years 1 to 10; $1.15 Million Years 11 to 100 (2021$)



3.4 Wastewater

3.4.1 Linear Infrastructure

The Township's current plan is to replace wastewater mains at the end of their useful lives. Mains with a diameter less than or equal to 450 mm are assumed to be replaced with PVC mains. Larger diameter mains are assumed to be replaced with concrete mains. Manholes are replaced with the mains with the cost included in the replacement cost of the main. The replacement cost of wastewater mains is shown in Table 3-7. Table 3-8 presents the lifespans used for various wastewater main materials.

Table 3-7: Wastewater Main Replacement Costs per Metre (2021$)

Main Size Range	Cost / m
<=200 mm	$785
250 - 300 mm	$965
350 - 375 mm	$1,325
450 mm	$1,390
600 mm	$1,810
675 mm	$2,175
750 mm	$2,295

Table 3-8: Lifespan of Wastewater Main by Material

Main Material	Lifespan (Years)
Unknown	75
CP; HDPE; PVC	90

With these assumptions, the average annual lifecycle cost over the next 100 years for wastewater mains is $860,000. Figure 3-14 shows the forecasted distribution of these costs.

Figure 3-14: Distribution of Costs of Forecasted Lifecycle Activities for Wastewater Mains – No Funding Constraint (2021$)

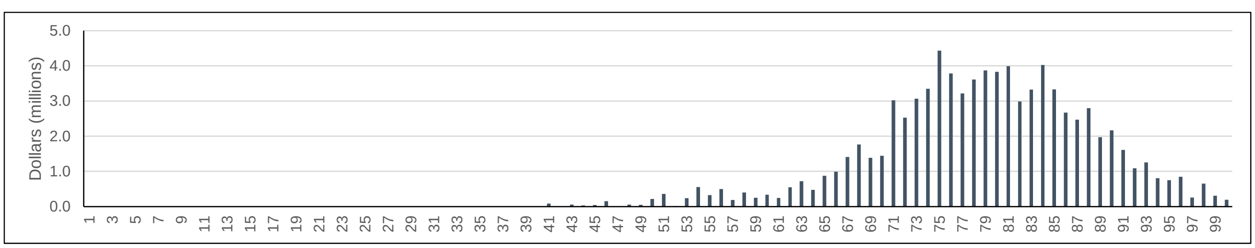
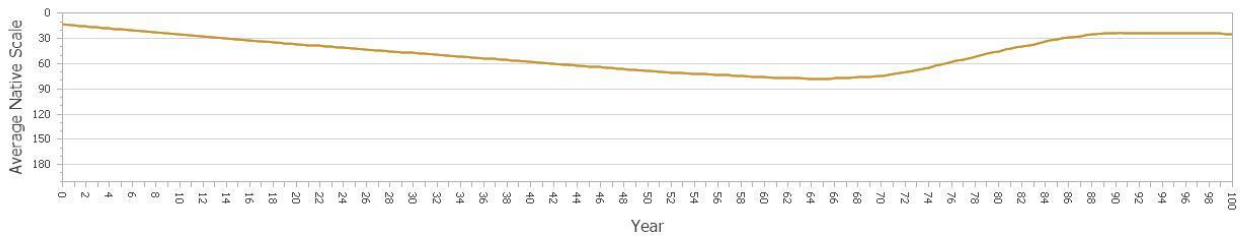


Figure 3-15 and Figure 3-16 show how condition evolves over time if funding is constrained to the 100-year average of the unconstrained scenario. With this funding level, average ULC% increases to 78% about two-thirds of the way through the forecast period. The major reinvestment that is forecasted then reduces the ULC% to 24% at the end of the forecast period.

Figure 3-15: Condition Profile Forecast for Wastewater Mains (Constrained) - $0.86 Million (2021$)

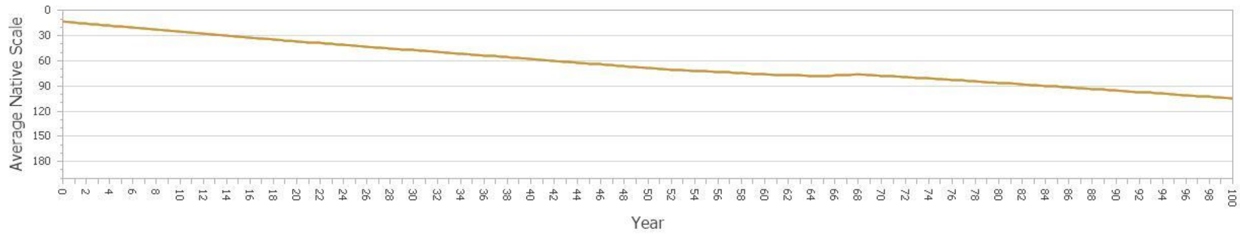
Figure 3-16: Forecast of Average ULC% for Wastewater Mains (Constrained) - $0.86 Million (2021$)



Expenditures for wastewater mains in the Township's current 10-year capital plan average $160,000 per year. Figure 3-17 and Figure 3-18 show how condition evolves over time if funding is constrained to this level over the next 100 years, adjusting only for inflation. Average ULC% rises to 105% by the end of the forecast period.

Figure 3-17: Condition Profile Forecast for Wastewater Mains (Constrained) - $0.16 Million (2021$)

Figure 3-18: Forecast of Average ULC% for Wastewater Mains (Constrained) - $0.16 Million (2021$)

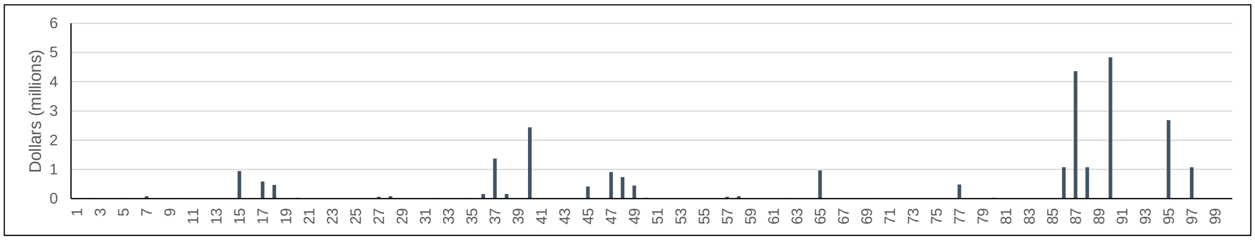


3.4.2 Pumping Stations and Grinder Pumps

A detailed Wastewater Pump Station Review of the Township's eight wastewater pump stations was completed in 2020 by Ainley Consulting. This review estimated the expected replacement dates and costs for the pump station components. The types of components evaluated include: pumps, standby power, HVAC, electrical, roofs, and sump pumps. A cost for the full reconstruction of the pump stations at the end of their useful lives was also provided. Details on the assumed lifespans and replacement dates of components were provided in the report and will not be duplicated here.

The average of the 100-year forecast of capital costs in the study is $240,000 (updated to 2021$). Current average annual funding for wastewater pump stations from the Township's 10-year capital plan is approximately $80,000.

Figure 3-19: Distribution of Costs of Forecasted Lifecycle Activities for Pumping Stations –



The grinder pumps are assumed to have a lifespan of 10 years. With this assumption, the average annual lifecycle cost for grinder pumps is $2,800 which rounds to zero when reporting figures rounded to the nearest $10,000.

3.5 Stormwater

3.5.1 Linear Infrastructure

The Township's current plan is to replace stormwater mains at the end of their useful lives. Mains with a diameter less than or equal to 450 mm are assumed to be replaced with PVC mains. Larger diameter mains are assumed to be replaced with concrete mains. Manholes and catch basins are replaced together with the mains and therefore their replacement costs are included in the replacement cost of the main. The replacement cost of stormwater mains by main diameter is shown in Figure 3-9. Figure 3-10 presents the lifespans used for various stormwater main materials.

Table 3-9: Stormwater Main Replacement Costs per Metre (2021$)

Main Size Range	Cost / m
<=200 mm	$600
250 - 380 mm	$700
450 - 525 mm	$900
600 - 1050 mm	$1,200
1090 - 1500 mm	$2,200
1650 - 2100 mm	$3,600
>2100 mm	$7,000

Table 3-10: Lifespan of Stormwater Main by Material

Main Material	Lifespan (Years)
Unknown	75
CP; HDPE; PV; PVC	90

With these assumptions, the average annual lifecycle cost over the next 100 years for stormwater mains is $880,000. Figure 3-20 shows the forecasted distribution of these costs.

Figure 3-20: Distribution of Costs of Forecasted Lifecycle Activities for Stormwater Mains – No Funding Constraint (2021$)

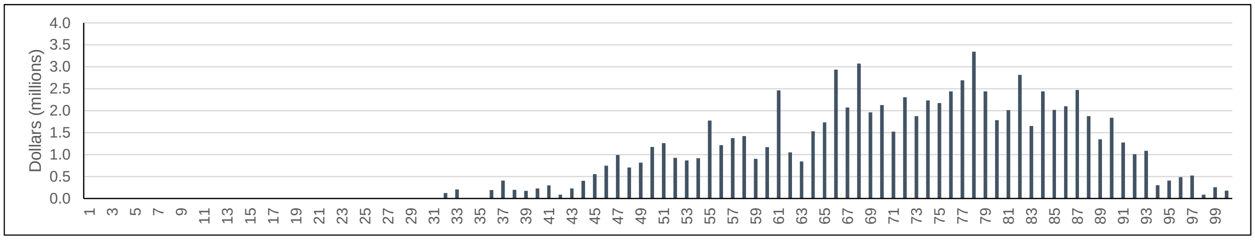


Figure 3-21 and Figure 3-22 show how condition evolves over time if funding is constrained to the 100-year average of the unconstrained scenario. With this funding level, average ULC% increases to 68% about half-way through the forecast period. The reinvestment that is forecasted then reduces the ULC% to 32% at the end of the forecast period.

Figure 3-21: Condition Profile Forecast for Stormwater Mains (Constrained) - $0.88 Million (2021$)

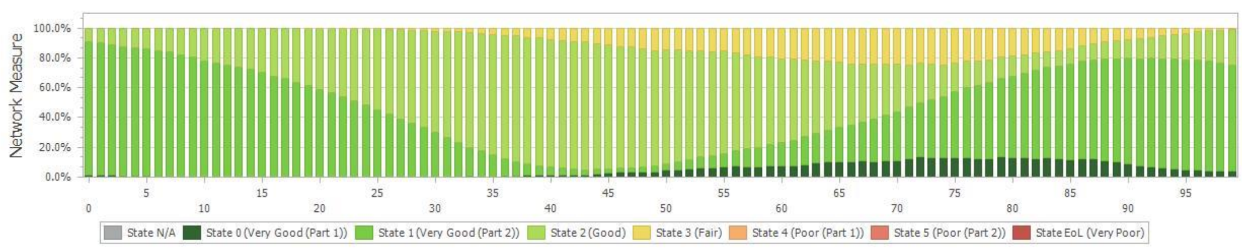
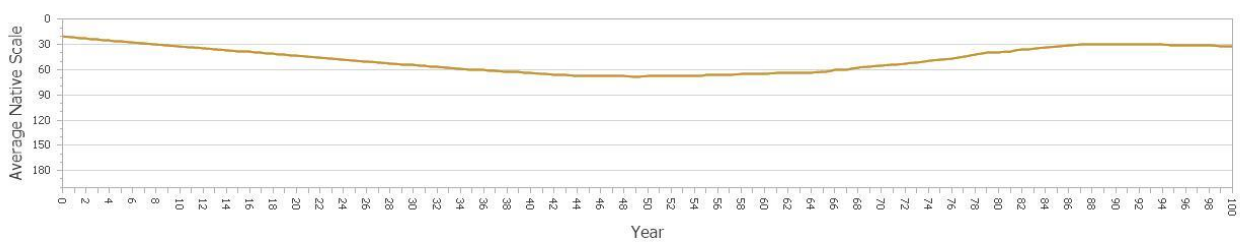


Figure 3-22: Forecast of Average ULC% for Stormwater Mains (Constrained) - $0.88 Million (2021$)



The Township's current 10-year capital plan does not include any replacement forecasts for stormwater mains. Figure 3-23 and Figure 3-24 show how condition evolves over time if no funding is available over the next 100 years. Average ULC% rises to 133% by the end of the forecast period.

Figure 3-23: Condition Profile Forecast for Stormwater Mains (Constrained) – No Funding

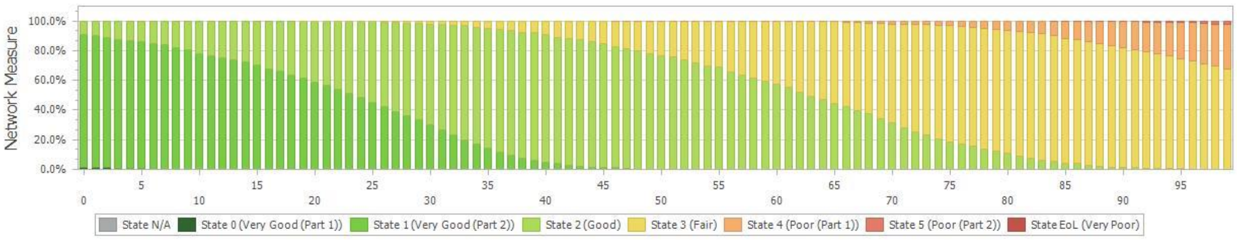
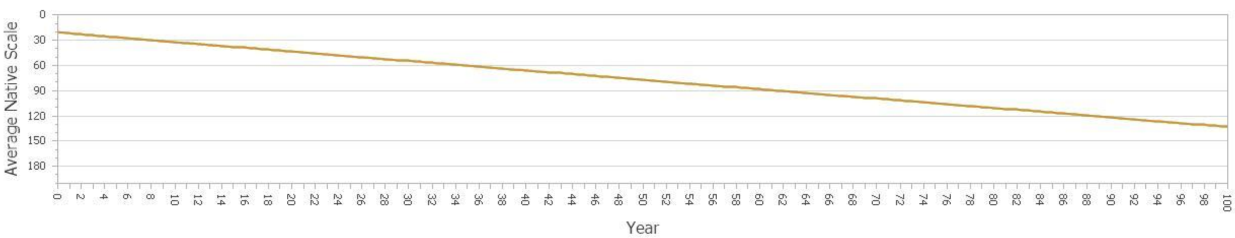


Figure 3-24: Forecast of ULC% for Stormwater Mains (Constrained) – No Funding



3.5.2 *Stormwater Ponds and Oil and Grit Separators*

Stormwater ponds are not replaced in their entirety. Minor components are replaced as needed. The only major capital cost is for cleanouts of wet ponds, where built up sedimentation is removed. The timing of cleanouts will depend on the quality of the incoming stormwater and could change over time. At present, information on the rate of sediment build up is not available. For the purposes of this asset management plan, it has been assumed that wet ponds are cleaned out every 15 years. Dry ponds are assumed not to have any capital costs associated with them.

The cost of a cleanout depends on the volume of sediment that needs to be removed. Where storage capacity for wet ponds is available, the cleanout costs have been estimated assuming the pond is at 50% capacity at the time of cleanout and that the cost of sediment removal is $1,000 per cubic meter. Where pond size data is not available, it has been assumed that the cleanout cost is $400,000.

Based on these assumptions and available inventory data, the average annual cost of cleanouts is expected to be approximately $2.2 million. The 10-year capital plan has funding for stormwater pond cleanouts averaging $490,000 annually.

No age or condition data is available for OGSs. To create a high-level estimate of funding needs, a lifespan of 50 years has been assumed with the OGSs being replaced at the end of their useful life. With this assumption, the average annual lifecycle cost is approximately $20,000

Chapter 4
Financial Summary

4. Financial Summary

4.1 Introduction

This chapter details the forecasted funding necessary to sustainably finance the lifecycle management strategies presented in Chapter 3 and examines the relationship between these funding needs and the Township's planned level of capital investment over the next 10 years.

An annual lifecycle funding target is the amount of funding that would be required annually to fully finance a lifecycle management strategy over the long-term. By planning to achieve this annual funding level, the Township would theoretically be able to fully fund capital works as they arise. In practice, capital needs are often "lumpy" in nature due to the value of works being undertaken changing year-to-year. By planning to achieve this level of funding over the long-term, the periods of relatively low capital needs would allow for the building up of lifecycle reserve funds that could be drawn upon in times of relatively high capital needs.

4.2 Lifecycle Funding Target and Planned Expenditures

Based on the lifecycle management strategies presented in Chapter 3, the annual lifecycle funding target for the Township's core assets is approximately $10.93 million. The Township is currently planning for average annual expenditures of approximately $7.24 million, as detailed in its 10-year capital plan. A breakdown of the lifecycle funding targets and planned capital expenditures, by asset class, is presented in Table 4-1.

Planned investment in water assets is currently higher than the annual lifecycle funding target because of a planned replacement program for ductile iron mains. Planned investments in transportation, wastewater, and storm water infrastructure are below the respective annual lifecycle targets.

Given that planned capital expenditures are generally below long-run average annual lifecycle funding targets, the Township should plan for making contributions to lifecycle reserves to help offset higher capital expenditures in years beyond the 10-year capital forecast.

Table 4-1: Summary of 100-year Average Annual Funding Need and Average Annual Funding in 10-year Capital Plan by Asset Class (2021$)

Asset Class	100-year Average Annual Funding Required	Average Annual Expenditures in Current 10-year Capital Plan	Average Expenditures as a Percentage of Funding Required
Tax Supported			
Roads	$3,740,000	$2,680,000[1]	67%
Bridges and Structural Culverts	$1,820,000	$1,430,000	79%
Stormwater	$3,120,000	$490,000	16%
Sub-total: Tax Supported	$8,680,000	$4,600.000	53%
Rate Supported			
Water	$1,150,000	$1,780,000	155%
Wastewater	$1,100,000	$850,000	77%
Sub-total: Rate Supported	$2,250,000	$2,630,000	117%
Total	**$10,930,000**	**$7,240,000**	**66%**

4.3 Future Improvements

The analysis presented herein does not represent a comprehensive financial strategy. Sources of funding for the planned capital expenditures have not been analyzed in this iteration of the asset management plan. Furthermore, this plan does not attempt to quantify the increase to the lifecycle funding target that naturally arises due to the acquisition and expansion of infrastructure. These costs should be explored and implemented in a comprehensive financing strategy in the future. Examining these growth-related capital needs and their impacts on the financing strategy will provide for a comprehensive assessment of the sustainability of the Township's overall asset management system.

[1] Based on the 10 Year Paving Strategy and Pavement Management Plan Final Report (2020)

Once a comprehensive capital needs forecast, including all of the Township's assets, has been developed through future expansions of this asset management plan, a full financing strategy can be developed. It is noted that the Township will be required to include a comprehensive financing strategy will in the asset management plan by July 1, 2025.