Asset Management Plan Update – Core Assets

Town of Kingsville

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List of Acronyms and Abbreviations

B.C.I.	Bridge Condition Index
C.I.R.C.	Canadian Infrastructure Report Card
E.C.A.	Environmental Compliance Approvals
I.J.P.A.	Infrastructure for Jobs and Prosperity Act
O. Reg. 588/17	Ontario Regulation 588/17
O.S.I.M.	Ontario Structure Inspection Manual
P.C.I.	Pavement Condition Index
P.S.A.B.	Public Sector Accounting Board
U.L.C.%	Useful Life Consumed 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 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 Town of Kingsville (Town) retained Watson & Associates Economists Ltd. (Watson) to assist in updating its 2023 Asset Management Plan for core infrastructure assets. The main purpose of this update is to incorporate non-core Transportation assets such as streetlights, traffic signals, sidewalks, and pedestrian crossings into the Town's asset management plan, in order to bring the Town into compliance with the July 1, 2024 requirements of Ontario Regulation 588/17. Additionally, this asset management plan update also provides updated replacement cost valuations, updated information on current levels of service, and identifies proposed levels of service. Following the completion of this asset management plan, the Town will need to shift its focus to developing a financial strategy to meet the July 1, 2025 requirements of O. Reg. 588/17.

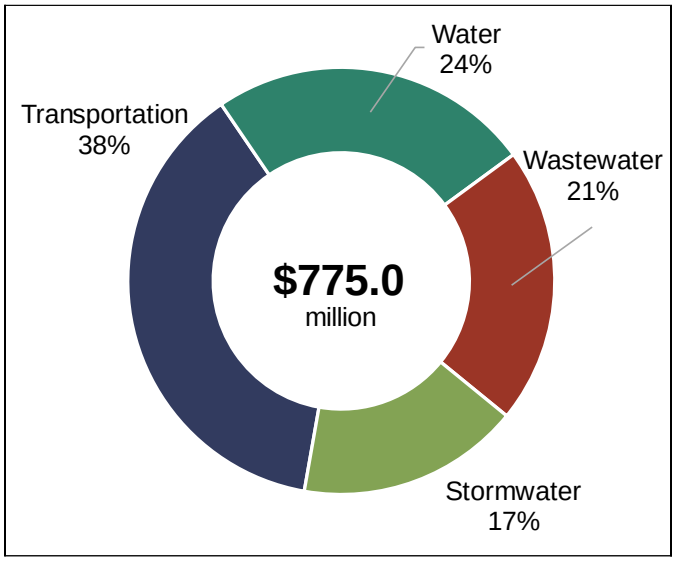
The total current replacement cost of the assets covered by this plan is estimated to be approximately $775 million. Transportation assets comprise the largest share of this replacement cost at approximately $292.3 million (38%), followed by water assets at approximately $189.4 million (24%), wastewater assets at approximately $162.4 million (21%), and lastly, stormwater assets at approximately $130.9 million (17%).

A breakdown of the replacement cost by asset class is provided in Table 1-1 and is further illustrated in Figure 1-1.

Table 1-1: Distribution of Replacement Cost by Asset Class

Asset Class	Current Replacement Cost
Transportation	$292,275,000
Water	$189,396,000
Wastewater	$162,424,000
Stormwater	$130,885,000
Total	**$774,980,000**

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



1.2 Legislative Context for the Asset Management Plan

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

Prior to 2009, it was common municipal practice to expense capital assets in the year of their acquisition or construction. Consequently, this meant that many municipalities did not have appropriate tracking of their capital assets, especially with respect to any changes that capital assets may have undergone (i.e. betterments, disposals, etc.). Furthermore, this also meant that many municipalities had not yet established inventories of their capital assets, both in their accounting structures and financial statements. As a result of revisions to *Section 3150 – Tangible Capital Assets* of the *Public Sector Accounting Board* (PSAB) handbook, which came into effect for the 2009

fiscal year, municipalities were forced to change this long-standing practice and capitalize their tangible capital assets over the term of the asset's expected useful service life. In order to comply with this revision, municipalities needed to establish asset inventories, if none previously existed.

In 2012, the Province launched the Municipal Infrastructure Strategy, which required municipalities and local service boards seeking provincial funding to demonstrate how any proposed project fits within a broader 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 municipal asset management plans, the Province produced a document entitled *Building Together: Guide for Municipal Asset Management Plans*. This document outlined the information and analyses 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 requires that asset management plans be developed that define levels of service, identify the lifecycle activities that will be undertaken to achieve those levels of service, and provide a financial strategy to support the levels of service and lifecycle activities.

As noted earlier, this update of the Town's 2023 Asset Management Plan for core infrastructure assets has been completed to bring the Town's road-related assets into its scope. This update also identifies proposed levels of service for all assets within the scope of the Town's core asset management plan. Over the coming months the Town will be undertaking the final phase of its asset management plan, which will entail developing a financial strategy. The final phase of the asset management plan will bring the Town into full compliance with the 2025 requirements of O. Reg. 588/17.

1.3 Asset Management Plan Development

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

The preparation of this update to the Town's asset management plan was based on the steps summarized below:

1. Compile asset information into complete inventories that contain relevant asset attributes such as size, quantity, age, useful service life expectations, and replacement cost. As part of this step, replacement costs were updated, where required, using a combination of the Town's recent procurement data and/or applicable inflationary indices.

2. Define and assess the current condition of assets using a combination of staff input, existing background reports and studies (e.g. Road Needs Study, OSIM Bridge Inspections), and age-based condition analysis.

3. Update current levels of service based on analyses of available data and review of various background reports.

4. Update lifecycle management strategies that identify the activities required to maintain the current levels of service. The outputs of these strategies were utilized to develop forecasts of annual capital and significant operating expenditures for each asset class.

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 summary information on the Town'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, with each section focusing on an individual asset class.

2.2 Transportation

2.2.1 State of Local Infrastructure

The Town 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 Town. The Town's transportation assets comprise roadways, bridges, structural culverts, and road-related assets such as sidewalks, pedestrian crossings, traffic signals, and streetlights. The estimated current replacement cost of these assets is approximately $292.3 million.

The road network consists of paved and gravel roads with an estimated combined replacement cost of approximately $209.8 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. A spatial illustration of the Town's road network and its extent is provided in Map 2-1.

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

Surface Type	Quantity	Average Age	Replacement Cost (2024$)
Paved	235.1 km	17 years	$205,059,000
Gravel	19.7 km	23 years	$4,764,000
Total	**254.8 km**		**$209,823,000**

The Town owns and maintains 63 structures comprising 44 vehicular bridges, 4 pedestrian bridges, and 15 structural culverts (diameter ≥ 3m) with an estimated combined replacement cost of approximately $59.8 million. Table 2-2 provides a breakdown of the quantities, average ages, and replacement costs by structure type. A visual rendering of the data presented in Table 2-2 is provided in Figure 2-2 and a spatial illustration is provided in Map 2-1.

Table 2-2: Summary of Quantity, Age, and Replacement Cost by Structure Type – Structures

Structure Type	Quantity	Average Age	Replacement Cost (2024$)
Vehicular Bridges	44	40 years	$36,875,000
Pedestrian Bridges	4	43 years	$1,234,000
Structural Culverts	15	23 years	$21,733,000
Total	**63**		**$59,842,000**

The Town also owns and maintains a variety of road-related assets comprising six pedestrian crossings, traffic signals at six intersections, approximately 51.4 kilometres of sidewalks, and 1,756 streetlights. The estimated combined replacement cost of the Town's road-related assets is approximately $22.6 million. Table 2-3 provides a breakdown of the quantities and replacement costs by asset. With the exception of streetlights, there is currently insufficient data available to report the average age of the

Town's road-related assets. The Town's streetlights are estimated to be approximately nine years old on average.[1]

Table 2-3: Summary of Quantity and Replacement Cost of Road-related Assets

Asset Type	Quantity	Replacement Cost (2024$)
Streetlights	1,756	$9,658,000
Traffic Signals	6 signalized intersections	$1,800,000
Sidewalks	51.4 km	$10,642,000
Pedestrian Crossings	6	$510,000
Total		**$22,610,000**

[1] Approximately 90% (1,568 out of 1,756) of the Town's streetlights were put in service in 2016 when the Town completed an LED conversion program. The remaining 10% of streetlights have come into service since 2016.

Figure 2-1: Summary Information – Road Network

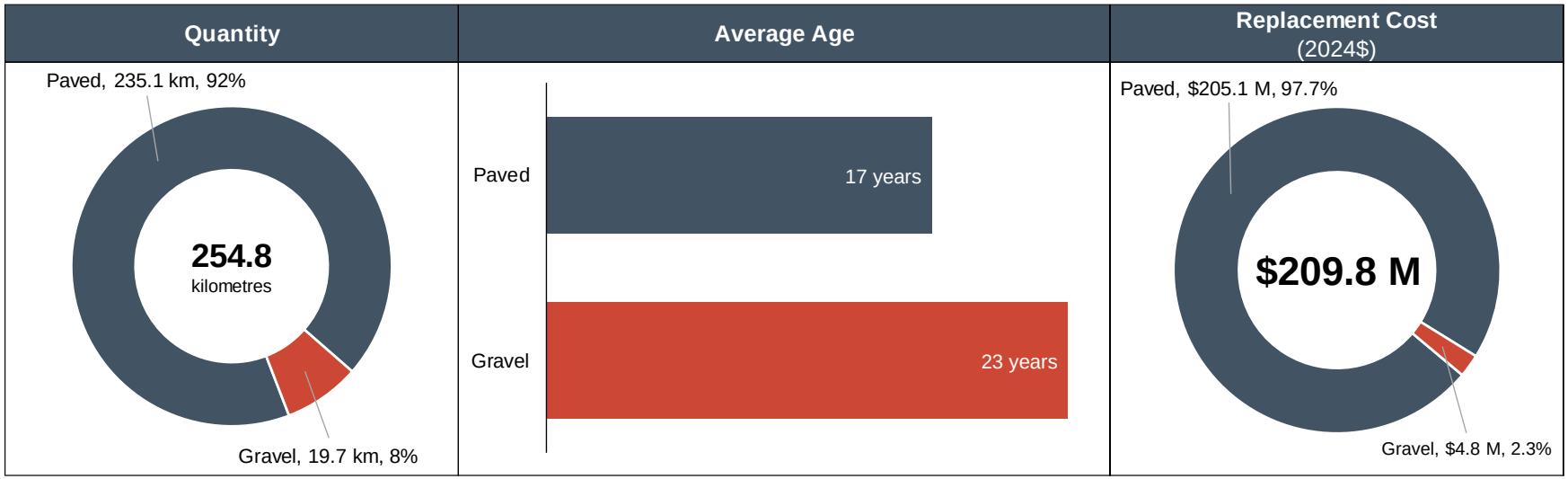
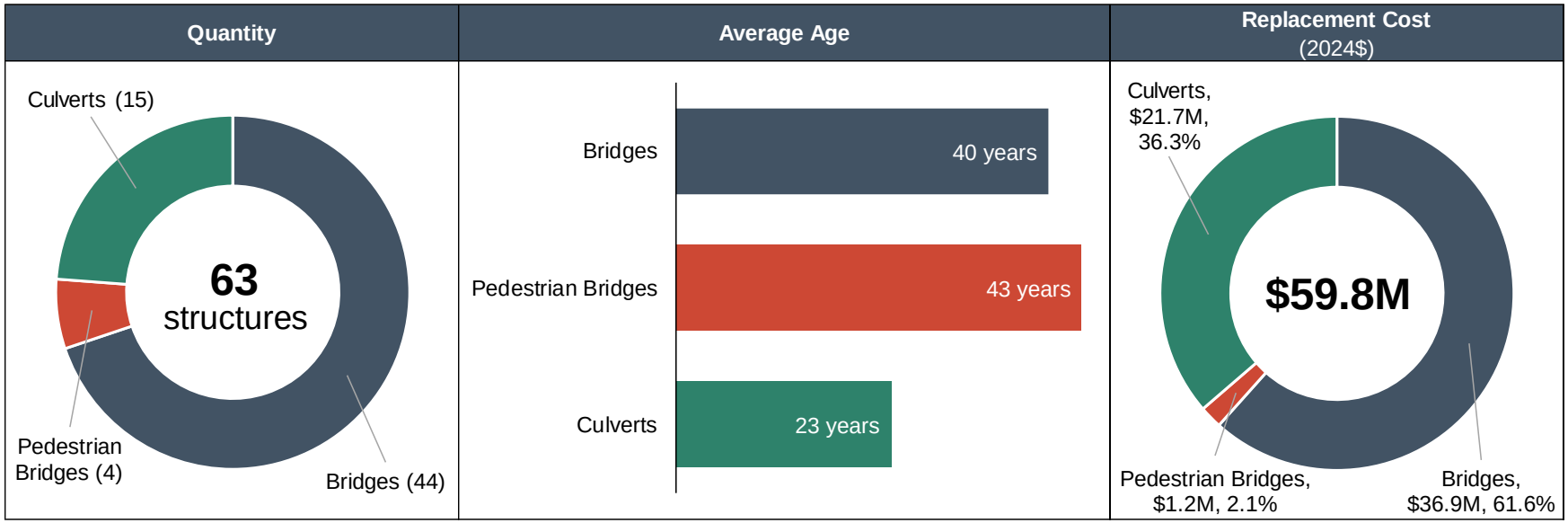
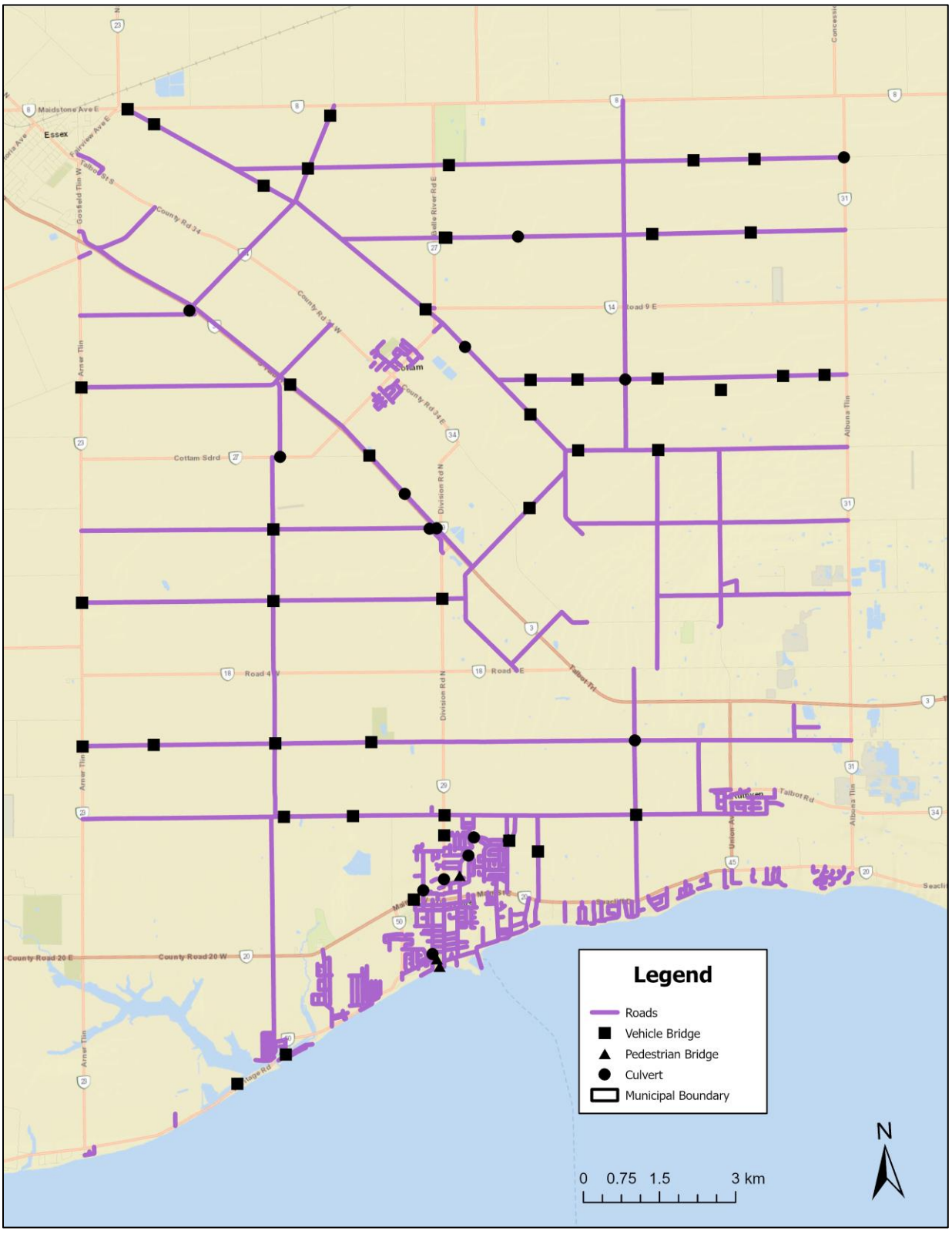


Figure 2-2: Summary Information – Structures



Map 2-1: Roads and Structures



2.2.2 Condition

The Town completes regular condition assessments of the road network. Roads are assessed using the Pavement Condition Index (P.C.I.). The P.C.I. is measured on a scale from 0 to 100, with 100 being an asset in as-new condition and 0 being a failed asset. To better communicate the condition of the paved road network, the numeric condition ratings for paved roads have been segmented into qualitative condition states as shown in Table 2-4. Moreover, descriptions of roads in these condition states are provided to better communicate the condition to the reader. Based on the most recent assessment, the average condition of paved roads is a P.C.I. of 71. The distribution of road network length by P.C.I. rating range is illustrated in Figure 2-3.

The condition of the Town's gravel roads has not been formally assessed, however, based on current maintenance practices it is estimated that gravel roads are on average in fair condition.

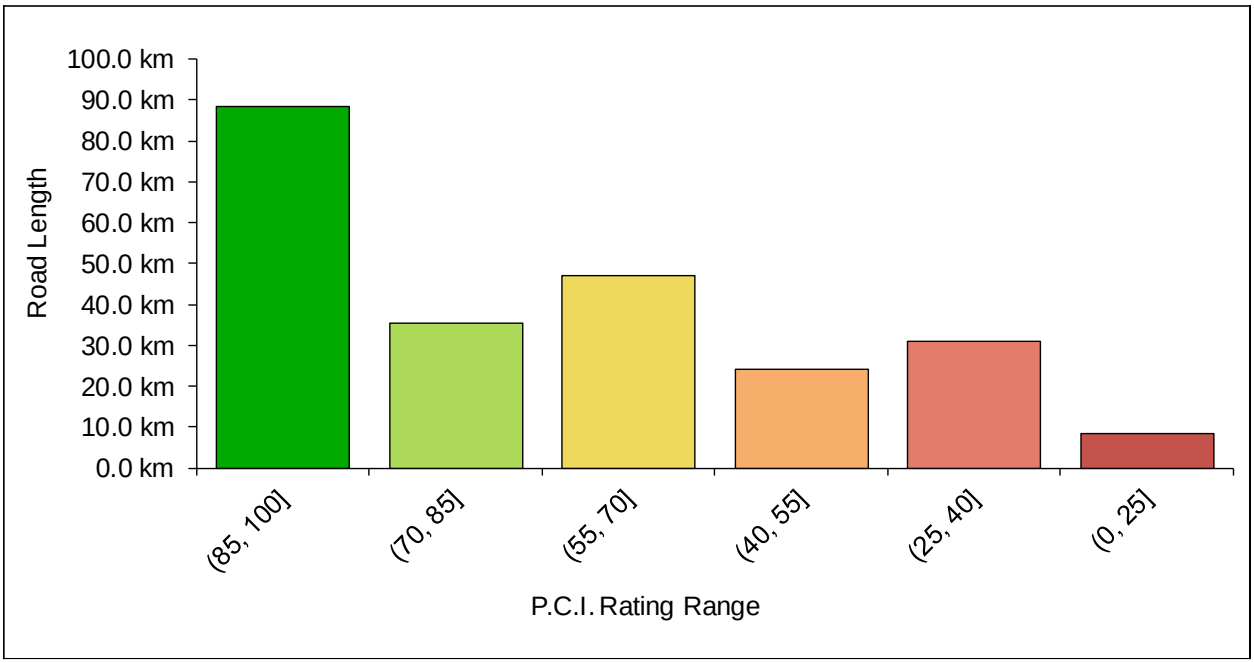
Table 2-4: Road Condition States Defined with Respect to Pavement Condition Index

P.C.I. Range	Condition State	Description[1]
85 < P.C.I. ≤ 100	**Good**	A very smooth ride. Pavement is in good condition with few cracks.
70 < P.C.I. ≤ 85	**Satisfactory**	A smooth ride with just a few bumps or depressions. The pavement is in satisfactory condition with frequent very slight or slight cracking.
55 < P.C.I. ≤ 70	**Fair**	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 < P.C.I. ≤ 55	**Poor**	An uncomfortable ride with frequent to extensive bumps or depressions. Cannot maintain the posted speed at the 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 adapted from "SP-024 Manual for Condition Rating of Flexible Pavements" (Ontario Ministry of Transportation, 2016).

P.C.I. Range	Condition State	Description[1]
25 < P.C.I. ≤ 40	**Very 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 very poor condition with moderate alligatoring and extensive severe cracking and distortion.
0 ≤ P.C.I. ≤ 25	**End of Life**	The pavement is in serious condition with extensive severe cracking, alligatoring and distortion.

Figure 2-3: Distribution of Road Network Length by P.C.I. Rating Range



In accordance with O. Reg. 104/97, the Town completes biennial inspections of its bridges and structural culverts following the O.S.I.M. The most recent inspections were completed by AMTEC Engineering Ltd. in 2023. Each structure was assigned a Bridge Condition Index (B.C.I.). The B.C.I. 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 structures have been segmented into qualitative condition states. Photographs and descriptions of these condition states are provided in Table 2-5 to better communicate the condition to the reader.

Table 2-5: Examples and Descriptions of Structure Condition States

Condition State	B.C.I. Range	Bridge Photos[1]	Structural Culvert Photos[1]	Description
Good	70 < B.C.I. ≤ 100			Repair/maintenance work is not usually required within the next five years.
Fair	60 < B.C.I. ≤ 70			Repair/maintenance work is usually scheduled within the next five years. This may represent an ideal time to schedule major rehabilitation, from an economic perspective.
Poor	0 ≤ B.C.I. ≤ 60			Repair/maintenance work is usually scheduled within approximately one year.

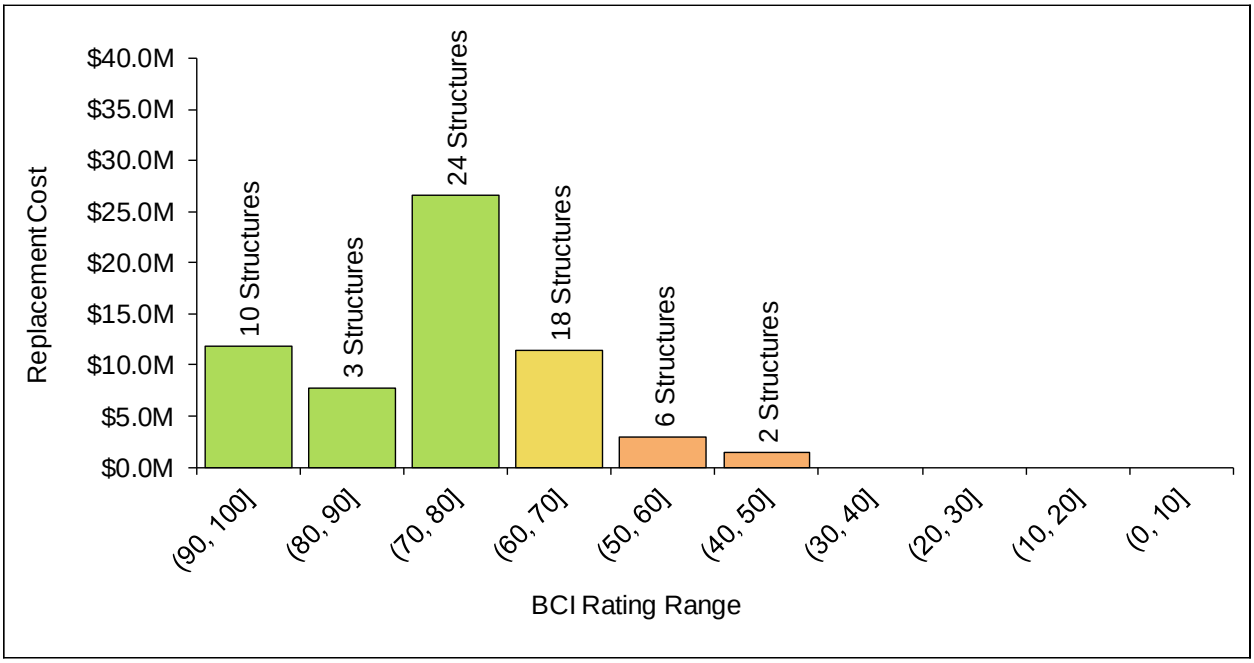
[1] Photos are reproduced from the Town's Bridge and Culvert Inspections Report (AMTEC Engineering Ltd., Nov. 2021)

The average B.C.I. ratings and corresponding condition states for structures are summarized in Table 2-6 below. On average (weighted by replacement cost), vehicular bridges are in a Good condition state, pedestrian bridges are in a Fair condition state, and structural culverts are in a Good condition state. The distribution of structure condition (as measured by B.C.I.) by structure replacement value by is presented in Figure 2-4.

Table 2-6: Structure Condition Analysis

Structure Type	Quantity	Condition (Weighted Average B.C.I.)	Average Condition State
Vehicular Bridges	44	75	**Good**
Pedestrian Bridges	4	69	**Fair**
Structural Culverts	15	82	**Good**

Figure 2-4: Distribution of Replacement Cost of Structures by B.C.I. Rating Range



The Town completes regular inspections of its sidewalks to identify tripping hazards and other deficiencies. However, these inspections do not result in a formal condition rating. In the future, the Town may wish to expand its already established road network condition assessment program to include sidewalks. To date, the Town has not formally assessed the condition of pedestrian crossings, streetlights, and traffic signals.

2.2.3 Levels of Service

The levels of service currently provided by the Town's transportation system are, in part, a result of the state of local infrastructure identified above. The levels of service framework defines the performance measures that will be tracked over time, and identifies the current and proposed levels of service. There are prescribed levels of service reporting requirements under O. Reg. 588/17 for core transportation assets (i.e., roads and structures). Table 2-7 and Table 2-8 include the prescribed 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 transportation assets provide. 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 2-7 explains the Town'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;
- The '2024 Performance' column in Table 2-8 reports current performance for the performance measure;
- The 'Proposed Performance' column in Table 2-8 identifies the proposed performance for each performance measure; and
- The 'Explanation of Proposed Performance' column in Table 2-8 provides further details on the proposed performance, including why the proposed level of service is appropriate for the Town.

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

Service Attribute	Community Levels of Service
Scope	The Town's transportation assets enable the movement of people and goods within the Town and provide connectivity to regional roads. The Town's transportation assets are used by pedestrians, cyclists, passenger vehicles, commercial truck traffic, and emergency vehicles.
	The scope of the Town's transportation network, including roads and structures, is illustrated by Map 2-1. This map shows the geographical distribution of the Town's roads and locations of structures.
Quality	To aid in interpreting condition states, descriptions of roads, and structures in different condition states are provided in Table 2-4 and Table 2-5, respectively. Table 2-5 also includes photos of structures in different condition states.

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

Service Attribute	Performance Measure	2024 Performance	Proposed Performance	Explanation of Proposed Performance
Scope	Number of lane-kilometres of arterial roads as a proportion of square kilometres of land area of the Town.	0.08 km/km²	0.08 km/km²	The Town's Transportation Master Plan indicates that traffic operations are expected to continue operating at acceptable levels of service until year 2037. The Town is not planning to construct any new arterial roads over the next ten years.
	Number of lane-kilometres of collector roads as a proportion of square kilometres of land area of the Town.	0.06 km/km²	0.07 km/km²	The Town's Transportation Master Plan recommends the construction of a new 1.8 km collector road to maintain adequate service levels. This new collector road is proposed to be constructed in 2026.
	Number of lane-kilometres of local roads as a proportion of square kilometres of land area of the Town.	0.81 km/km²	N/A	The Town is not setting an explicit target for this performance measure. It is noted that this metric is expected to increase over time as new local roads are emplaced to service new developments (e.g., local roads within new subdivisions).
	Percentage of bridges in the Town with loading or dimensional restrictions.	0%	0%	The Town intends to maintain the current levels of service – i.e., ensuring that no bridges have loading or dimensional restrictions.
Quality	For paved roads in the Town, the average pavement condition index value.	71	70	The Town has maintained an average P.C.I. of around 70 for the past five years. Maintaining the road network at an average P.C.I. of 70 has generated minimal complaints from residents regarding road conditions.
	For unpaved roads in the Town, the average surface condition.	Fair	Fair	The Town has a relatively small network of gravel roads and maintains these roads in accordance with the Minimum Maintenance Standards Ontario Reg 239/02.
	For bridges in the Town, the average bridge condition index value.	75[1]	70	The Town has historically maintained its bridges at an average B.C.I. above 70. The intent is to keep bridges at this condition or better. However, a more relevant metric is deemed to be the percentage of bridges maintained at a condition of “Fair” or better (i.e., B.C.I. > 60), as reported below.
	For structural culverts in the Town, the average bridge condition index value.	82	70	The Town has historically maintained its structural culverts at an average B.C.I. above 70. The intent is to keep bridges at this condition or better. However, a more relevant metric is deemed to be the percentage of structural maintained at a condition of “Fair” or better (i.e., B.C.I. > 60), as reported below.
	Percentage of vehicular bridges (by replacement cost) in “Fair” or better condition.	90%	100%	The Town proposes to keep all bridges in a condition of “Fair” or better (i.e., B.C.I. > 60).
	Percentage of pedestrian bridges (by replacement cost) in “Fair” or better condition.	34%	100%	The Town proposes to keep all pedestrian bridges in a condition of “Fair” or better (i.e., B.C.I. > 60).
	Percentage of structural culverts (by replacement cost) in “Fair” or better condition.	100%	100%	The Town proposes to keep all structural culverts in a condition of “Fair” or better (i.e., B.C.I. > 60).

[1] Average excludes pedestrian bridges.

2.3 Water

2.3.1 State of Local Infrastructure

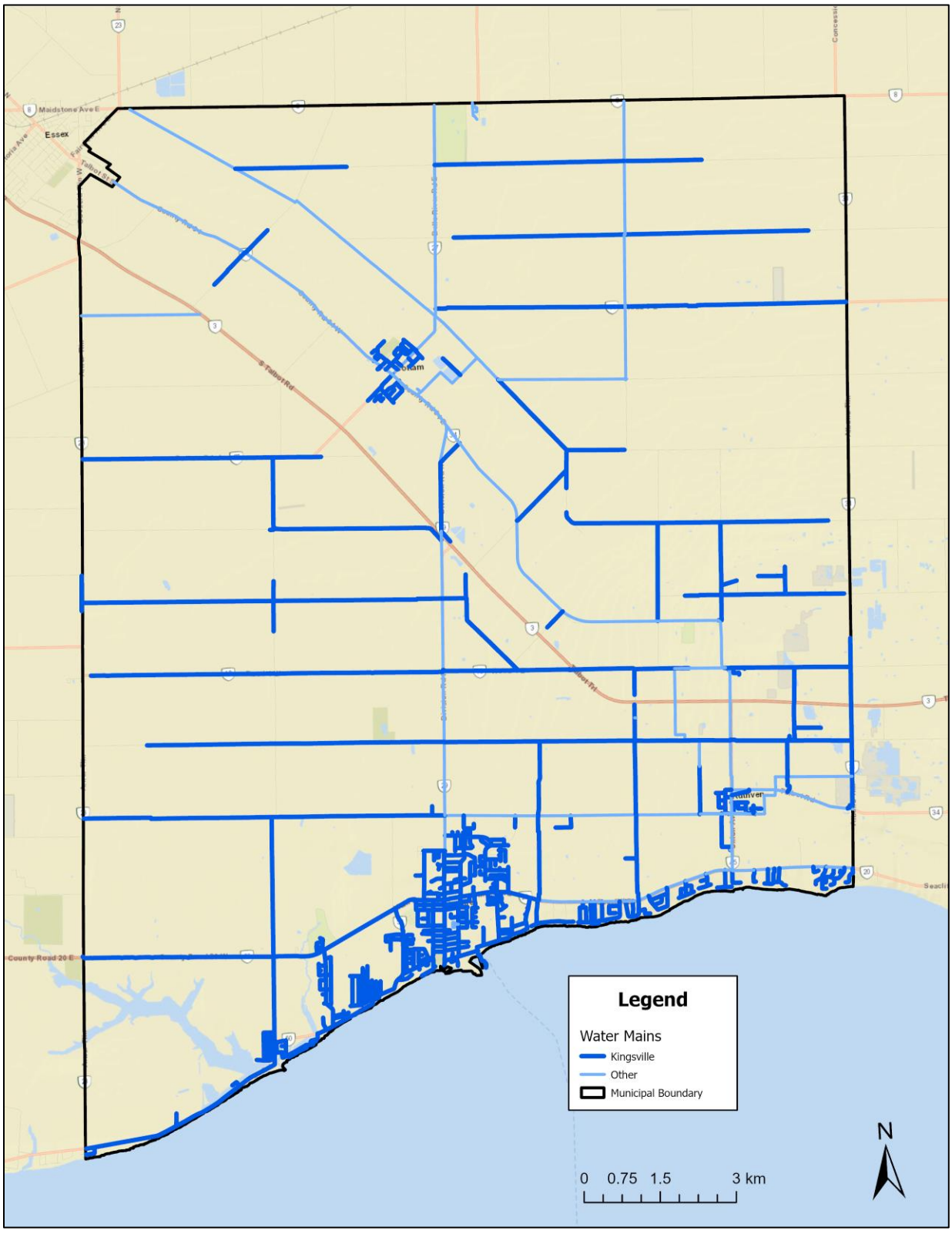
The Town's water distribution system supplies water to the majority of properties in the municipality from the Union Area Water Supply System. A spatial illustration of the extent of the Town's water distribution system is provided in Map 2-2. The Town's water infrastructure comprises approximately 234.4 kilometres of water mains (including several thousand appurtenances directly related to the mains such as valves, fire hydrants, and service connections), and over 8,800 water meters. The combined replacement cost of this infrastructure is estimated at $189.4 million. Table 2-9 provides summary information for the Town's water infrastructure, including quantities, average ages, and replacement costs by asset category.

Table 2-9: Water Infrastructure – Quantity, Age, and Replacement Cost by Asset Category

Asset Category	Quantity	Average Age	Replacement Cost (2024$)
Water Mains	234.4 km	32 years	$184,916,000
Valves	1,206		Included above
Service Connections	~8,500		Included above
Isolation Valves	1,004		Included above
Hydrants	1,095		Included above
Water Meters	8,831	<1 year[1]	$4,480,000
Total			**$189,396,000**

[1] Approximately 85% of the water meters were replaced in 2024.

Map 2-2: Water Distribution System



2.3.2 Condition

The condition of the Town's water assets has not been directly assessed through a physical condition assessment. In this asset management plan, the condition of the water assets is evaluated based on age relative to the expected useful life (i.e., based on the percentage of useful life consumed (U.L.C.%)). Useful lives were assigned to individual pipe segments based on material, and range from 80 to 100 years. A brand-new asset would have a U.L.C.% of 0%, indicating that zero percent of the asset's life expectancy has been utilized. Conversely, an asset that has reached its life expectancy would have a U.L.C.% of 100%. It is possible for assets to have a U.L.C.% greater than 100%, which occurs if an asset 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 assets that are near or beyond their typical life expectancy are likely to require replacement or rehabilitation in the near term.

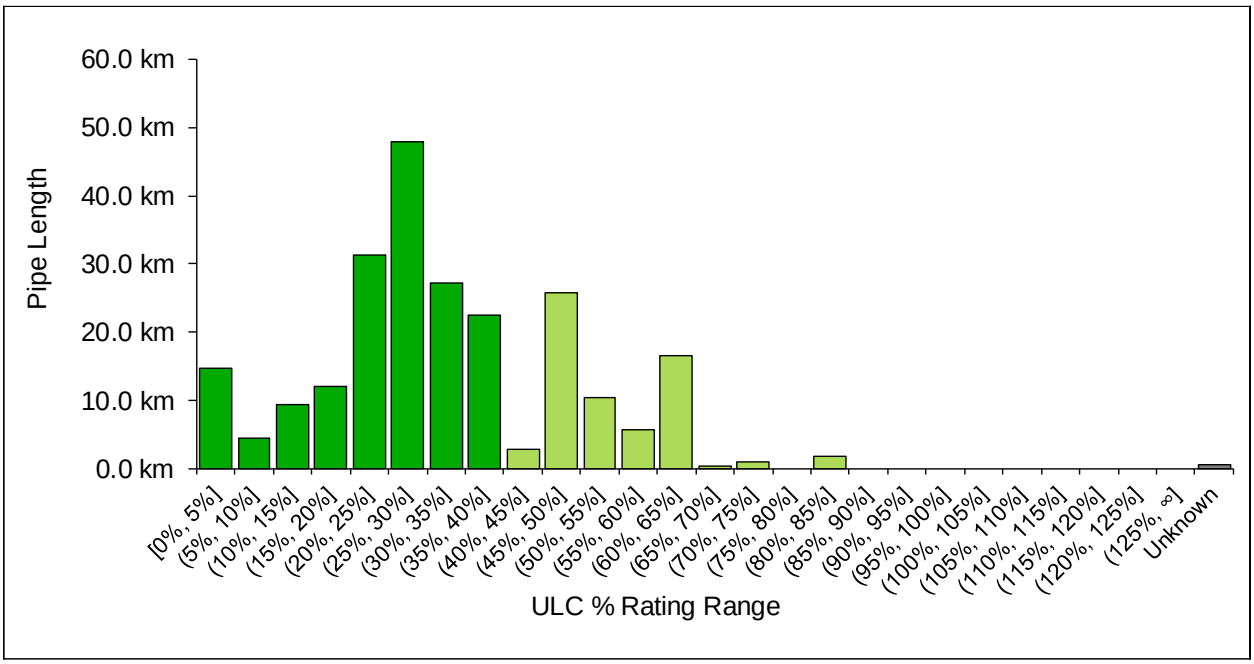
To better communicate the condition of water and other assets where U.L.C.% will be used, the U.L.C.% ratings have been segmented into qualitative condition states as summarized in Table 2-10. The scale is set to show that if assets are replaced around the expected useful life, they would be in the Fair condition state. The Fair condition state extends to 100% of expected useful life. Beyond 100% of useful life, the probability of failure is assumed to have increased to a point where performance would be characterized as Poor or Very Poor.

Table 2-10: Condition States Defined with Respect to U.L.C.% – Water Assets

Condition State	U.L.C.%
Very Good	0% ≤ U.L.C.% ≤ 45%
Good	45% < U.L.C.% ≤ 90%
Fair	90% < U.L.C.% ≤ 100%
Poor	100% < U.L.C.% ≤ 125%
Very Poor	125% < U.L.C.%

Figure 2-5 shows the distribution of water main length by condition (as measured by U.L.C.%). On average, Town's water mains are in the Very Good condition state.

Figure 2-5: Distribution of Water Mains by U.L.C.%



2.3.3 Levels of Service

This section provides an overview of the Town's level of service framework for water services.

Table 2-11: Community Levels of Service – Water

Service Attribute	Community Levels of Service
Scope	Water service is provided to customers in most areas of the Town, as illustrated in Map 2-2.
Reliability	The Town is committed to providing safe drinking water to its customers. The Town's Environmental Services Department: • Operates and maintains the drinking water supply system following all applicable legislation and regulations. • Ensures that all staff are well trained, competent to undertake the duties assigned them and certified appropriately. • Maintains and continually improves the Quality Management System. Boil water advisories can be triggered by adverse water quality test results or other problems in the water distribution system. Service interruptions can occur as a result of routine water system maintenance or asset failure. Both boil water advisories and service interruptions are handled in accordance with the Town's Quality Management System.

Table 2-12: Technical Levels of Service – Water

Service Attribute	Performance Measure	2024 Performance	Proposed Performance	Explanation of Proposed Performance
Scope	Percentage of properties connected to the Town water system.	86%[1]	N/A	The Town is not setting an explicit target for this performance measure. It is noted that the Town is in the process of expanding its Water network in the South West Service area. This expansion will enable the development of approximately 2,946 additional housing units. Furthermore, the Town will be undertaking a master servicing plan in 2025 for water and wastewater which will inform potential additional future system expansions. As development occurs and existing properties get subdivided, the number of properties connected to the Town's water system is expected to increase.
	Percentage of properties where fire flow is available.	83%[2]	N/A	The Town is not setting an explicit target for this performance measure. As noted above, the Town is in the process of expanding its Water network in the South West Service area. This expansion will enable the development of approximately 2,946 additional housing units. Furthermore, the Town will be undertaking a master servicing plan in 2025 for water and wastewater which will inform potential additional future system expansions. As development occurs and existing properties get subdivided, the number of properties where fire flow is available is expected to increase.
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 Town water system.	0 connection days / connection	0 connection days / connection	The Town manages its water system in accordance with strict regulatory requirements and strives for the highest level of service achievable – i.e., zero water boil advisories.
	The number of connection-days per year lost due to water main breaks compared to the total number of properties connected to the Town water system.	0.00581 connection days / connection	Minimize	The Town intends to minimize occurrences of watermain breaks.

[1] Estimated based on number of water meters relative to number of properties.
[2] Percentage of properties where fire flow is available is lower than the percentage of properties connected to the Town's water system because watermains with a diameter ≤ 4" do not support fire flow.

2.4 Wastewater

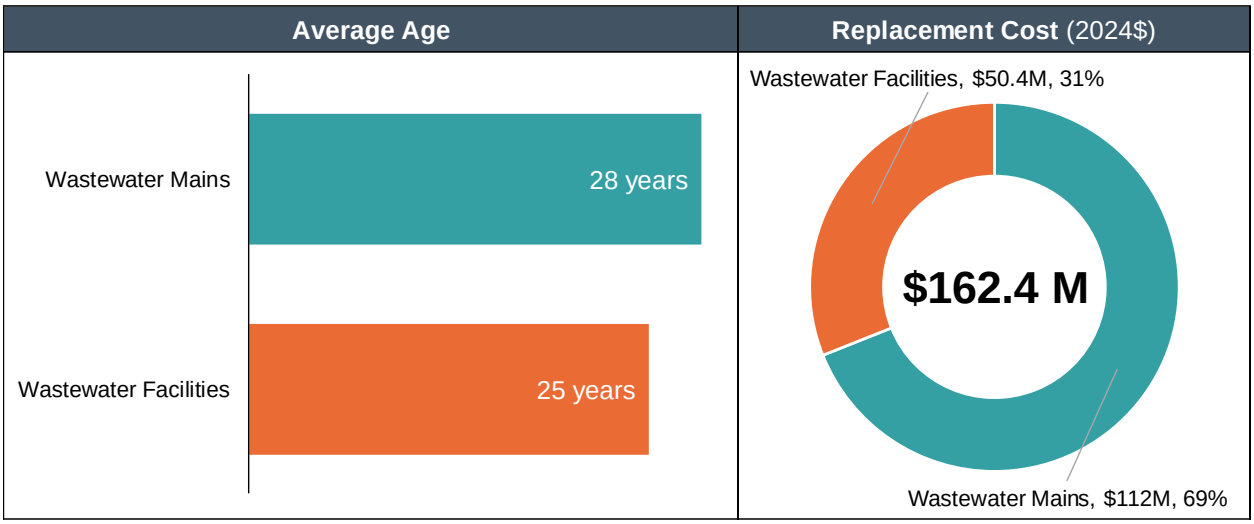
2.4.1 State of Local Infrastructure

The Town owns a wastewater system servicing customers in Cottam, Kingsville/Lakeshore West, and Ruthven. A spatial illustration of the extent of the Town's wastewater collection system is provided in Map 2-3. The Town's wastewater infrastructure comprises approximately 118.3 kilometres of wastewater mains, 1,327 maintenance holes, 824 sanitary cleanouts, and several facilities including a wastewater treatment plant, two facultative lagoons, 13 pump stations, a blower building and a sludge dewatering building. The combined replacement cost of this infrastructure is estimated at $162.4 million. Table 2-13 provides summary information for the Town's wastewater infrastructure, including quantities, average ages, and replacement costs by asset category. A visual rendering of the data presented in Table 2-13 is provided in Figure 2-6.

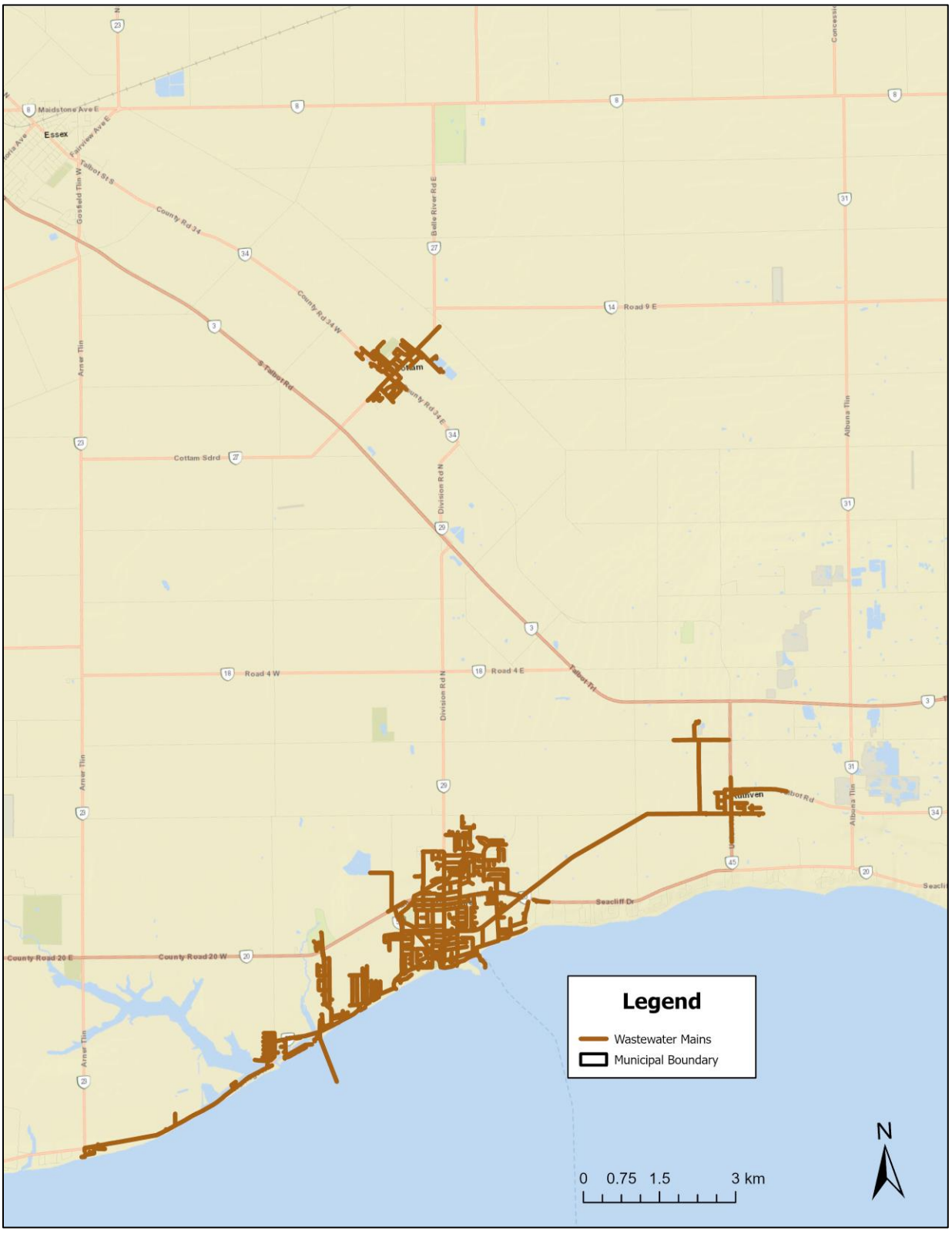
Table 2-13: Wastewater Infrastructure – Summary of Quantity, Age, and Replacement Cost by Asset Category

Asset Category	Quantity	Average Age	Replacement Cost (2024$)
Wastewater Mains	118.3 km	28 years	$112,003,000
Maintenance Holes	1,327		Included above
Sanitary Cleanouts	824		Included above
Wastewater Facilities	1 Wastewater Treatment Plant 2 Facultative Lagoons 13 Pump Stations 1 Blower Building 1 Sludge Dewatering Building	25 years	$50,421,000
Total			**$162,424,000**

Figure 2-6: Summary Information – Wastewater



Map 2-3: Wastewater Service Area



2.4.2 Condition

The condition of the Town's wastewater assets has not been directly assessed through a physical condition assessment. In this asset management plan, the condition of the wastewater assets is evaluated based on age relative to the expected useful life (i.e., based on the percentage of useful life consumed (ULC%)) as described for water assets in subsection 2.3.2.

Figure 2-7 shows the distribution of wastewater main length by condition (U.L.C.%) range. Figure 2-8 depicts the distribution of wastewater facilities by condition (U.L.C.%) range. On average, the Town's wastewater mains and wastewater facilities are in the Very Good condition state.

Figure 2-7: Distribution of Wastewater Mains by Condition

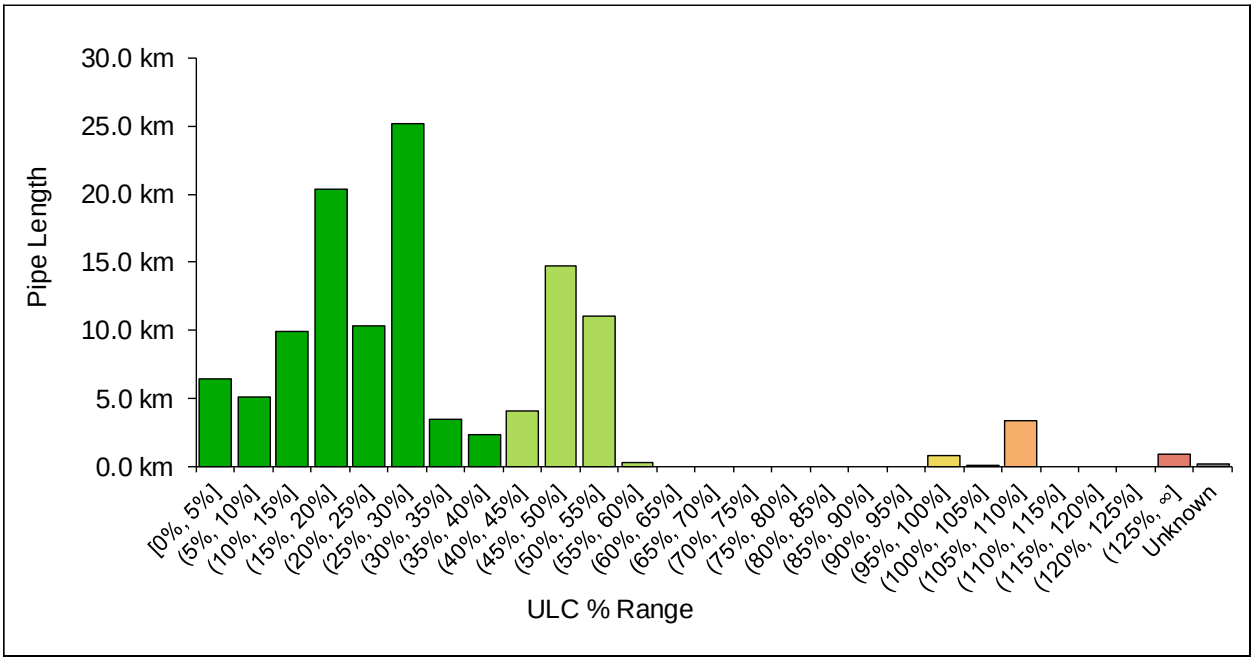
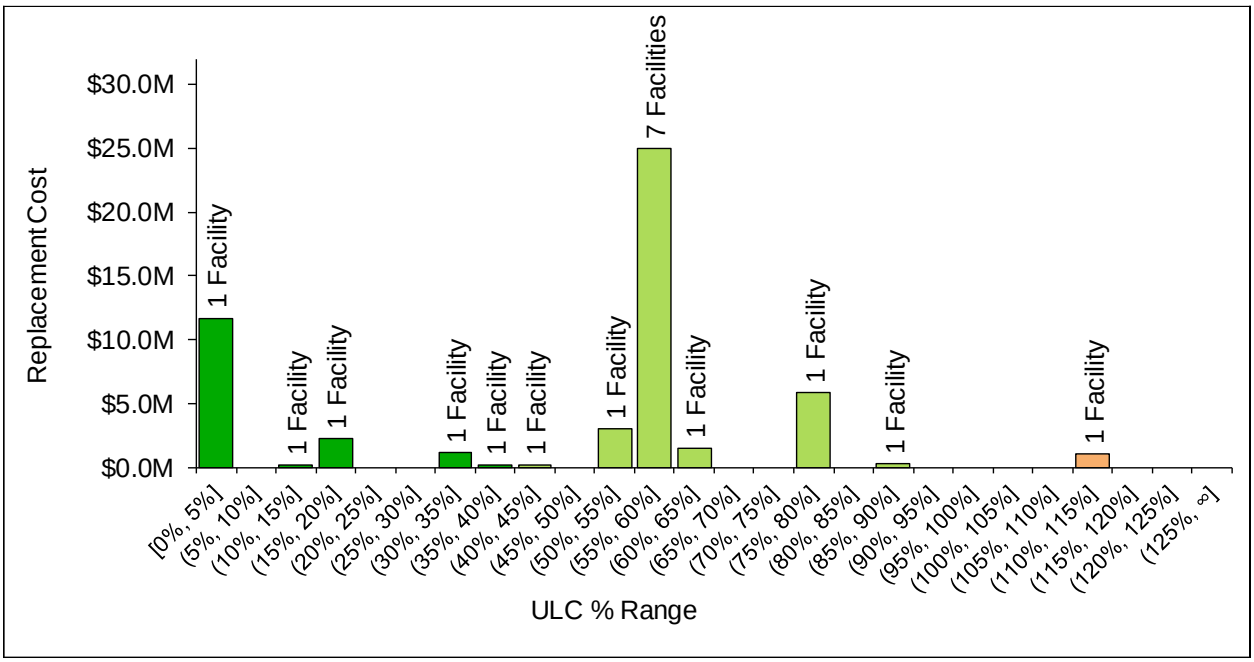


Figure 2-8: Distribution of Wastewater Facilities by Condition



2.4.3 Levels of Service

This section provides an overview of the Town's level of service framework for wastewater services.

Table 2-14: Community Levels of Service – Wastewater

Service Attribute	Community Levels of Service
Scope	Wastewater service is provided to customers in in Cottam and Kingsville/Lakeshore West, as illustrated in Map 2-3.
Reliability	The Town does not have combined sewers (sewers designed to carry both sanitary and storm water in a single pipe). Despite this, stormwater can enter the wastewater system through numerous sources (e.g., openings on maintenance hole covers, cracks, holes, failed joints, and incorrect or faulty connections). There are ongoing investigations underway to identify sources of inflow and infiltration as part of the Town's asset management initiatives.

Service Attribute	Community Levels of Service
	The Town's facilities are operated in accordance with Environmental Compliance Approvals (E.C.A.) as issued by the Ministry of Environment, Conservation and Parks. A description of the effluent that is discharged from each wastewater treatment facility is provided in the respective E.C.A.: • Cottam: 0434-CADSRQ • Kingsville: 6796-5JXRYS • Lakeshore West: 2771-A2CJL9

Table 2-15: Technical Levels of Service – Wastewater

Service Attribute	Performance Measure	2024 Performance	Proposed Performance	Explanation of Proposed Performance
Scope	Percentage of properties connected to the Town wastewater system.	55%	N/A	The Town is not setting an explicit target for this performance measure. The number of properties connected to the Town's wastewater system is expected to increase as development occurs and existing properties get subdivided. The Town will be undertaking a master servicing plan in 2025 for water and wastewater which will inform potential future system expansions.
Reliability	The number of connection-days per year lost due to wastewater backups compared to the total number of properties connected to the Town wastewater system.	0.00018 connection days / connection	Minimize	The Town intends to minimize occurrences of wastewater backups.
	The number of effluent violations per year due to wastewater discharge compared to the total number of properties connected to the Town wastewater system.	0 violations / connection	0 violations / connection	The Town manages its wastewater system in accordance with strict regulatory requirements and strives for the highest level of service achievable – i.e., zero effluent violations. It is noted that that effluent violations can occur due to factors outside of the Town's control (e.g., elevated levels of ammonia being discharged from private properties into the Town's wastewater system).

2.5 Stormwater

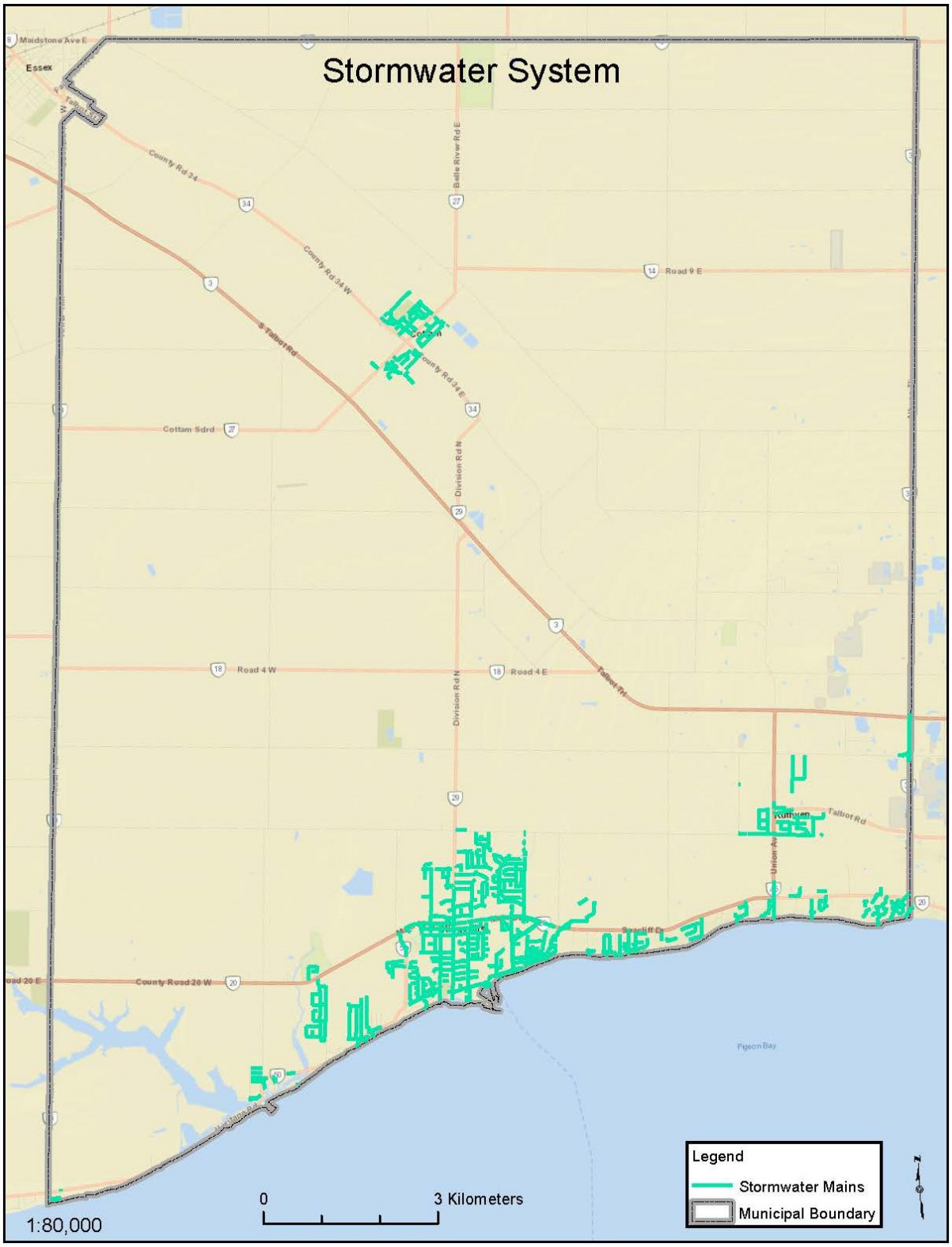
2.5.1 State of Local Infrastructure

The stormwater management system provides for the collection of stormwater in order to protect properties and roads from flooding, and to manage the volume and quality of stormwater discharged back to the environment. A spatial illustration of the extent of the Town's stormwater system is provided in Map 2-4. The Town's stormwater infrastructure comprises approximately 88.8 kilometres of stormwater mains (including several thousand appurtenances directly related to the mains such as maintenance holes, catch basins, and storm cleanouts), and 13 stormwater ponds (nine wet ponds and four dry ponds). The combined replacement cost of this infrastructure is estimated at $130.9 million. Table 2-16 shows summary information for the Town's stormwater system, including quantities, average ages and replacement costs by asset category.

Table 2-16: Stormwater Infrastructure – Quantity, Age, and Replacement Cost by Asset Category

Asset Category	Quantity	Average Age	Replacement Cost (2024$)
Stormwater Mains	88.8 km	29 years	$125,201,000
Maintenance Holes	1,085		Included above
Catch Basins	2,790		Included above
Storm Cleanouts	756		Included above
Stormwater Ponds	9 Wet Ponds 4 Dry Ponds	N/A	$5,684,000
Total			**$130,885,000**

Map 2-4: Stormwater System

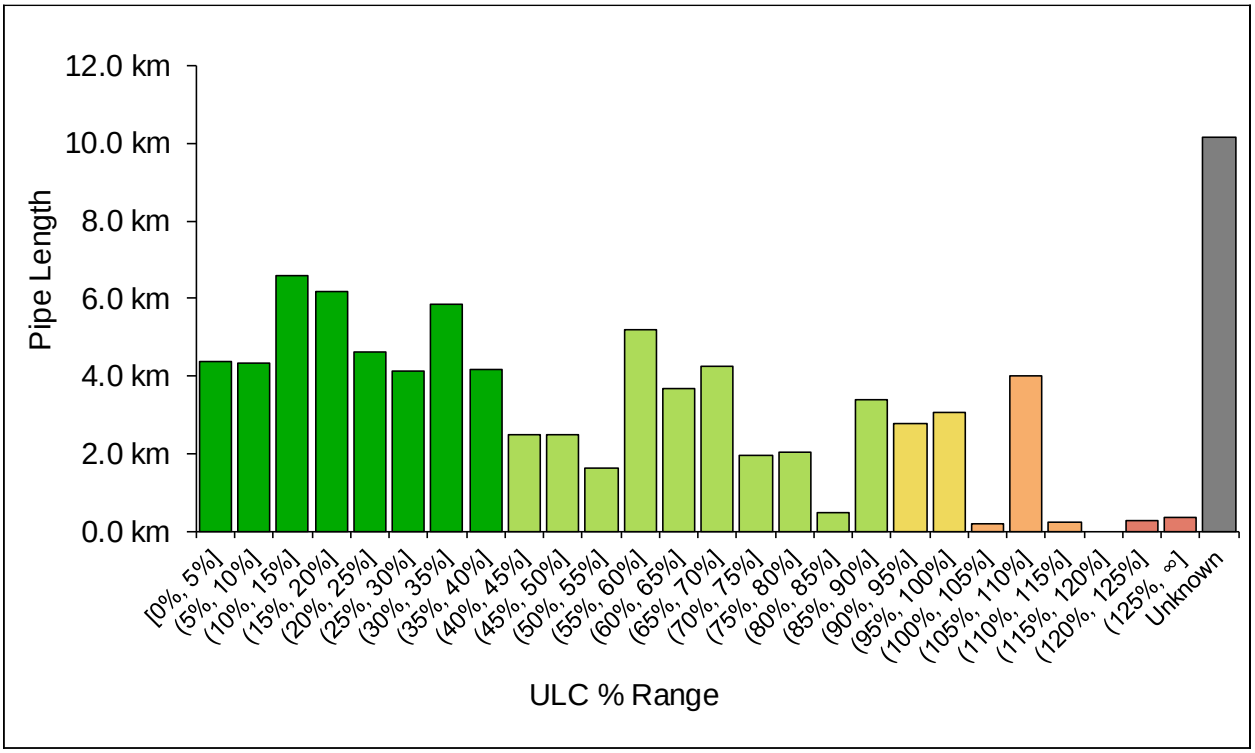


2.5.2 Condition

The condition of the Town's stormwater assets has not been directly assessed through a physical condition assessment. In this asset management plan, the condition of the stormwater assets is evaluated based on age relative to the expected useful life (i.e., based on the percentage of useful life consumed (ULC%)) as described for water assets in subsection 2.3.2.

Figure 2-9 shows the distribution of stormwater main length by condition (U.L.C.%) range. On average, Town's stormwater mains are in a Very Good condition state.

Figure 2-9: Distribution of Stormwater Mains by Condition (U.L.C.%) Range



2.5.3 Levels of Service

This section provides an overview of the Town's level of service framework for wastewater service.

Table 2-17: Community Levels of Service – Stormwater

Service Attribute	Community Levels of Service
Scope	The Town's stormwater system helps protect several areas of the municipality from flooding. The extent of the Town's stormwater management system is illustrated in Map 2-4.

Table 2-18: Technical Levels of Service – Stormwater

Service Attribute	Performance Measure	2024 Performance	Proposed Performance	Explanation of Proposed Performance
Scope	Percentage of properties in the municipality resilient to a 100-year storm.	N/A[1]	N/A	The Town is not setting an explicit target for this performance measure. Performance is expected to increase as new development occurs and as older infrastructure is replaced and upgraded. New developments are required to be resilient to the 100-year storm event.
	Percentage of the municipal stormwater management system resilient to a 5-year storm.	All stormwater infrastructure constructed in accordance with current design standards is expected to be resilient to a 5-year storm event. However, some of the older infrastructure may not be resilient to a 5-year storm.	N/A	The Town is not setting an explicit target for this performance measure. Performance will naturally improve over time as older infrastructure is replaced.

[1] The resiliency of properties in the Town to a 100-year storm has not been formally assessed. There have been several significant rainfall events in recent years that resulted in reports of flooding. Therefore, there are likely some properties in the Town that may not be resilient to a 100-year storm. It is noted that the Town's stormwater mains are sized to accommodate a 5-year storm, with roads designed to act as overland conveyance during more severe storm events. Stormwater ponds are sized to accommodate a 100-yr. storm.

2.6 Population Growth

According to its 2022 Development Charges Background Study, the Town's population is expected to reach approximately 26,120 residents by late 2032. This would represent an approximately 1.34% year-over-year increase compared to the estimated 2022 population of approximately 22,870 residents.

Future 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 Town's 2022 Development Charges Background Study and are funded through development charges imposed on new development. Utilizing development charges 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. The estimated capital expenditures related to the lifecycle activities required to maintain the current levels of service considering the projected increases in demand caused by growth are also included in the Town's 2022 Development Charges Background Study.

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 10-year lifecycle expenditure forecasts are preliminary estimates generated based on the lifecycle management models and current condition/age profile of the assets. Further adjustments may be made as the Town develops a financial strategy to support the asset management plan.

[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 10-year Lifecycle Expenditure Forecast

This section presents a preliminary estimate of the costs associated with maintaining the Town's core infrastructure assets at the current level of service. The estimate was developed based on the Town's 5-year capital forecasts by asset class and supplemented with annual allowances based on average annual lifecycle costs by asset class (see section 3.3).

The ten-year lifecycle expenditure forecast for the Town's core infrastructure assets is summarized in Figure 3-1. A further breakdown of the lifecycle expenditure forecast is provided in Table 3-1. Average annual expenditures over the forecast period have been estimated at approximately $13 million.

It is noted that the capital forecast presented herein is preliminary and is subject to change once the Town completes a financial strategy to support the asset management plan.

Figure 3-1: 10-year Lifecycle Expenditure Forecast (2024$)

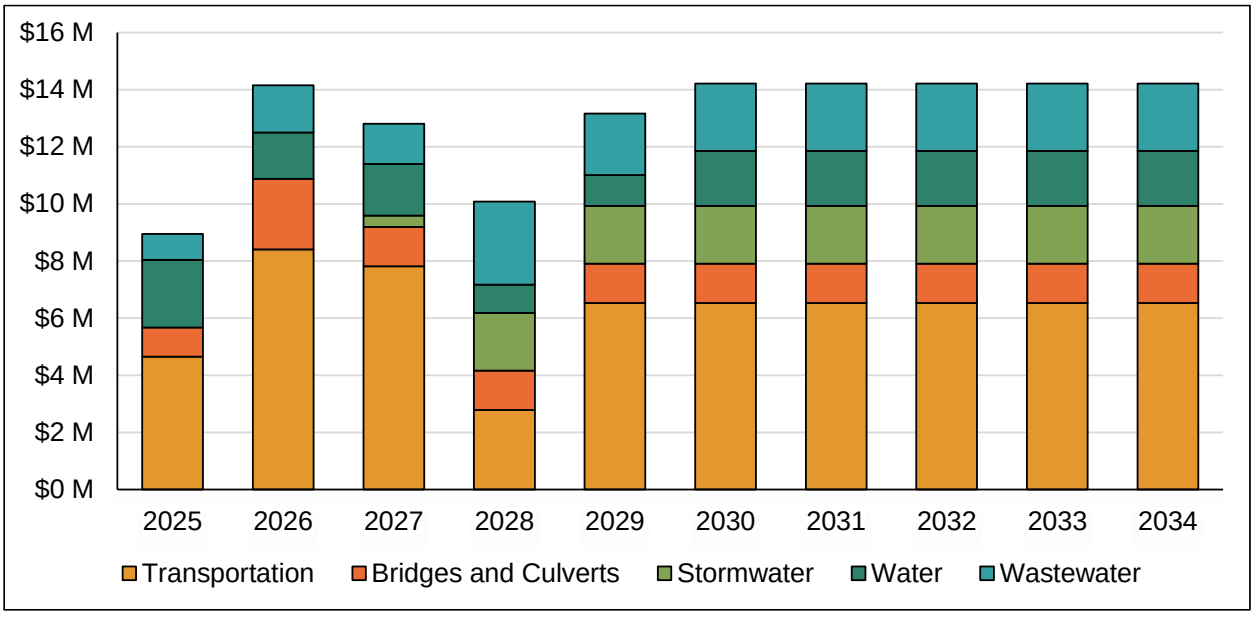


Table 3-1: 10-year Lifecycle Expenditure Forecast (2024$)

	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Transportation										
Roads - New Construction	$ 100,000	$ 600,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Roads - Lifecycle Rehabilitation	$ 4,550,000	$ 7,804,370	$ 7,818,555	$ 2,783,290	$ 5,742,000	$ 5,742,000	$ 5,742,000	$ 5,742,000	$ 5,742,000	$ 5,742,000
Road-related Assets	$ -	$ -	$ -	$ -	$ 788,000	$ 788,000	$ 788,000	$ 788,000	$ 788,000	$ 788,000
Sub-total Roads	**$ 4,650,000**	**$ 8,404,370**	**$ 7,818,555**	**$ 2,783,290**	**$ 6,530,000**	**$ 6,530,000**	**$ 6,530,000**	**$ 6,530,000**	**$ 6,530,000**	**$ 6,530,000**
Bridges and Culverts										
Replacement / Rehabiliation	$ 1,020,000	$ 2,475,000	$ 1,378,000	$ 1,378,000	$ 1,378,000	$ 1,378,000	$ 1,378,000	$ 1,378,000	$ 1,378,000	$ 1,378,000
Sub-total Roads	**$ 1,020,000**	**$ 2,475,000**	**$ 1,378,000**	**$ 1,378,000**	**$ 1,378,000**	**$ 1,378,000**	**$ 1,378,000**	**$ 1,378,000**	**$ 1,378,000**	**$ 1,378,000**
Stormwater										
Stormwater Mains	$ -	$ -	$ 393,600	$ 1,920,000	$ 1,920,000	$ 1,920,000	$ 1,920,000	$ 1,920,000	$ 1,920,000	$ 1,920,000
Stormwater Ponds	$ -	$ -	$ -	$ 105,000	$ 105,000	$ 105,000	$ 105,000	$ 105,000	$ 105,000	$ 105,000
Sub-total Stormwater	**$ -**	**$ -**	**$ 393,600**	**$ 2,025,000**	**$ 2,025,000**	**$ 2,025,000**	**$ 2,025,000**	**$ 2,025,000**	**$ 2,025,000**	**$ 2,025,000**
Water										
Water Mains & Related	$ 2,375,000	$ 1,623,150	$ 1,810,750	$ 986,500	$ 1,079,500	$ 1,927,000	$ 1,927,000	$ 1,927,000	$ 1,927,000	$ 1,927,000
Sub-total Water	**$ 2,375,000**	**$ 1,623,150**	**$ 1,810,750**	**$ 986,500**	**$ 1,079,500**	**$ 1,927,000**	**$ 1,927,000**	**$ 1,927,000**	**$ 1,927,000**	**$ 1,927,000**
Wastewater										
Wastewater Mains & Related	$ 40,000	$ -	$ 221,400	$ 1,293,000	$ 1,293,000	$ 1,293,000	$ 1,293,000	$ 1,293,000	$ 1,293,000	$ 1,293,000
Wastewater Facilities	$ 865,000	$ 1,655,000	$ 1,180,000	$ 1,620,000	$ 855,000	$ 1,059,000	$ 1,059,000	$ 1,059,000	$ 1,059,000	$ 1,059,000
Sub-total Wastewater	**$ 905,000**	**$ 1,655,000**	**$ 1,401,400**	**$ 2,913,000**	**$ 2,148,000**	**$ 2,352,000**	**$ 2,352,000**	**$ 2,352,000**	**$ 2,352,000**	**$ 2,352,000**
Grand Total	**$ 8,950,000**	**$ 14,157,520**	**$ 12,802,305**	**$ 10,085,790**	**$ 13,160,500**	**$ 14,212,000**	**$ 14,212,000**	**$ 14,212,000**	**$ 14,212,000**	**$ 14,212,000**

3.3 Lifecycle Funding Requirements

An annual lifecycle funding target describes 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 Town 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, however, 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.

The annual lifecycle funding targets by asset class and category are presented in Table 3-2 below. A variety of methods were used to estimate the lifecycle funding targets, and a description of each method is provided in Table 3-3.

Table 3-2: Annual Lifecycle Funding Targets by Asset Class and Category

Asset Category	Lifecycle Cost Estimation Method	Average Annual Lifecycle Cost (2024$)
Transportation		**$ 6,530,000**
Local Asphalt and Concrete	Lifecycle Analysis (see Figure 3-2)	$ 3,182,000
Collector and Arterial Asphalt	Lifecycle Analysis (see Figure 3-3)	$ 894,000
Rural Surface Treated	Lifecycle Analysis (see Figure 3-4)	$ 1,666,000
Road-related Assets	Useful Life (20-50 years, depending on asset type)	$ 788,000
Bridges & Culverts		**$ 1,378,000**
Bridges	Lifecycle Analysis (see Figure 3-5)	$ 737,000
Culvert - Concrete	Lifecycle Analysis (see Figure 3-5)	$ 214,000
Culvert - CSP	Lifecycle Analysis (see Figure 3-6)	$ 427,000
Water		**$ 2,151,000**
Water Mains	Useful Life (80-100 years, depending on material)	$ 1,927,000
Water Meters	Useful Life (20 years)	$ 224,000
Wastewater		**$ 2,352,000**
Wastewater Mains	Useful Life (50-100 years, depending on material)	$ 1,293,000
Wastewater Facilities	Annual Reinvestment Rate (2.10%)	$ 1,059,000
Stormwater		**$ 2,025,000**
Stormwater Mains	Useful Life (50-100 years, depending on material)	$ 1,920,000
Stormwater Ponds*	Annual Reinvestment Rate (1.85%)	$ 105,000

**The Town should consider undertaking an assessment of the cleanout volumes and frequencies associated with each stormwater pond, which would provide a better means of estimating annual lifecycle costs for these assets. Furthermore, the Town should consider implementing a regular inspection program for these assets.*

Table 3-3: Descriptions of Lifecycle Cost Estimation Methods

Lifecycle Cost Estimation Method	Description
Lifecycle Analysis Method	Average annual lifecycle costs estimated through generalized lifecycle models specific to an asset category. These generalized models were developed for the Town's Roads and Structures through discussions with Town staff, incorporating local knowledge and costing information. The generalized lifecycle models are summarized in figures 3-2 to 3-6.
Useful Life Method	Average annual lifecycle cost estimated by dividing the replacement cost of an asset by its life expectancy (useful life). This method was used to estimate the average annual lifecycle costs of the Town's road-related assets, water mains, water meters, wastewater mains, and stormwater mains.
Annual Reinvestment Rate Method	Annual lifecycle funding target estimated using annual reinvestment rates identified in the 2016 Canadian Infrastructure Report Card[1] (2016 C.I.R.C.). Because the C.I.R.C provides a range of annual reinvestment rates for each infrastructure category, the midpoint of the applicable range was used to calculate the annual lifecycle funding target. This method was used to estimate the annual lifecycle funding target for the Town's wastewater facilities and stormwater ponds.

[1] Canadian Infrastructure Report Card: Informing the Future. (The Canadian Council for Public-Private Partnerships, 2016). Accessed from https://www.pppcouncil.ca/web/pdf/infra_report_card_2016.pdf

3.3.1 Generalized Lifecycle Models

Figure 3-2: Generalized Lifecycle Model for Local Asphalt and Concrete Roads

Age	Lifecycle Activity	Notes	Unit Cost (per m², 2024$)
17	Mill and Pave (Two lifts)		$ 58.00
34	Mill and Pave (Two lifts)		$ 58.00
51	Mill and Pave (Two lifts)		$ 58.00
68	Mill and Pave (Two lifts)		$ 58.00
85	Full depth reconstruction (90mm thick asphalt)	Reconstruction includes curbs and boulevard restoration, but no catch basins or any other storm components.	$ 142.20

Average Annual Lifecycle Cost (per m²):	$	4.40
Total Surface Area of Local Asphalt and Concrete Roads (m²):		722,864
Total Annual Lifecycle Cost of Local Asphalt and Concrete Roads:	**$**	**3,182,334**

Figure 3-3: Generalized Lifecycle Model for Collector and Arterial Asphalt Roads

Age	Lifecycle Activity	Notes	Unit Cost (per m², 2024$)
17	Mill and Pave (Two lifts - 100mm)		$ 58.00
34	Mill and Pave (Two lifts - 100mm)		$ 58.00
51	Mill and Pave (Two lifts - 100mm)		$ 58.00
68	Mill and Pave (Two lifts - 100mm)		$ 58.00
85	Full depth reconstruction (140mm thick asphalt)	Reconstruction includes curbs and boulevard restoration, but no catch basins or any other storm components.	$ 162.50

Average Annual Lifecycle Cost (per m²):	$	4.64
Total Surface Area of Collector and Arterial Asphalt Roads (m²):		192,528
Total Annual Lifecycle Cost of Collector and Arterial Asphalt Roads:	**$**	**893,562**

Figure 3-4: Generalized Lifecycle Model for Rural Surface Treated Roads

Age	Lifecycle Activity	Notes	Unit Cost (per m², 2024$)
10	Tar and chip resurfacing	Pulverizing, 2" of granular, and 3 lifts of tar and chip. Includes replacement of minor culverts and spot base repairs.	$ 20.30
n/a	Full depth reconstruction	Includes excavation, new granular, and three lifts of tar and chip. Excludes swales.	$ 86.50

Average Annual Lifecycle Cost (per m²):	$	2.03
Total Surface Area of Rural Surface Treated Roads (m²):		820,610
Total Annual Lifecycle Cost of Rural Surface Treated Roads:	**$**	**1,665,732**

Figure 3-5: Generalized Lifecycle Model for Bridges & Concrete Culverts

Age	Lifecycle Activity	Notes	Cost
25	Minor Rehabilitation		15% of replacement value
50	Major Rehabilitation		30% of replacement value
75	Replacement		100% of replacement value

Average Annual Lifecycle Cost (per $1 of replacement value):	$	0.0193
Total Replacement Value of Bridges & Concrete Culverts:	$	49,177,124
Total Annual Lifecycle Cost of Bridges & Concrete Culverts:	**$**	**950,758**

Figure 3-6: Generalized Lifecycle Model for CSP Culverts

Age	Lifecycle Activity	Notes	Cost
25	Replacement		100% of replacement value

Average Annual Lifecycle Cost (per $1 of replacement value):	$	0.0400
Total Replacement Value of CSP Culverts:	$	10,664,870
Total Annual Lifecycle Cost of CSP Culverts:	**$**	**426,595**

Chapter 4
Summary

4. Summary

This asset management plan update was prepared to incorporate non-core Transportation assets such as streetlights, traffic signals, sidewalks, and pedestrian crossings into the Town's asset management plan. Furthermore, this update was prepared to identify proposed levels of service for the assets covered by this plan. This plan has been developed to bring the Town into compliance with the current set of requirements of *O. Reg. 588/17* and also to address some of the future requirements of *O. Reg. 588/17*. The plan provides summary information for the Town's infrastructure assets (including replacement cost valuation and condition), identifies current and proposed levels of service, and includes a 10-year forecast of lifecycle activities and associated costs that would be required for the Town to achieve proposed levels of service. The plan is based on the best information available to the Town at this time. In the coming months, the Town will need to further expand the asset management plan by developing a detailed financial strategy. The financial strategy will need to be completed by July 1, 2025 in accordance with the requirements of *O. Reg. 588/17*.