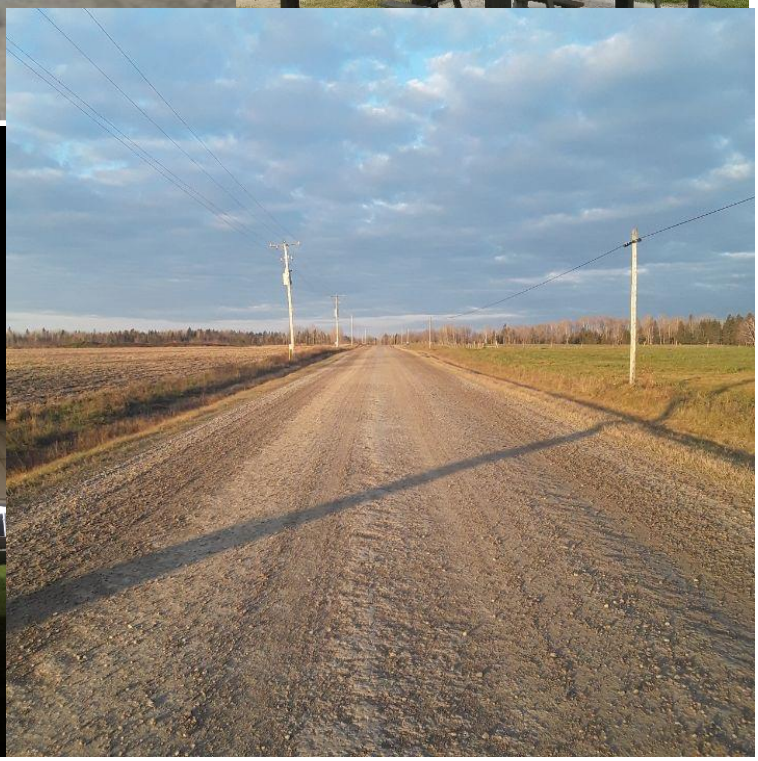

Asset Management Plan

Municipality of Charlton and Dack

July 2022

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Table of Contents

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.

Through funding, Watson & Associates Economists Ltd. (Watson) was retained by the Province of Ontario to consult with the Municipality on this update. With this update, it is the intent to move the Municipality's asset management practices towards compliance with Ontario Regulation 588/17. It is intended to be a tool for Municipal staff and Council to use during various decision-making processes, including the annual budgeting process and future capital grant application processes. This plan will serve as a road map for sustainable infrastructure planning going forward.

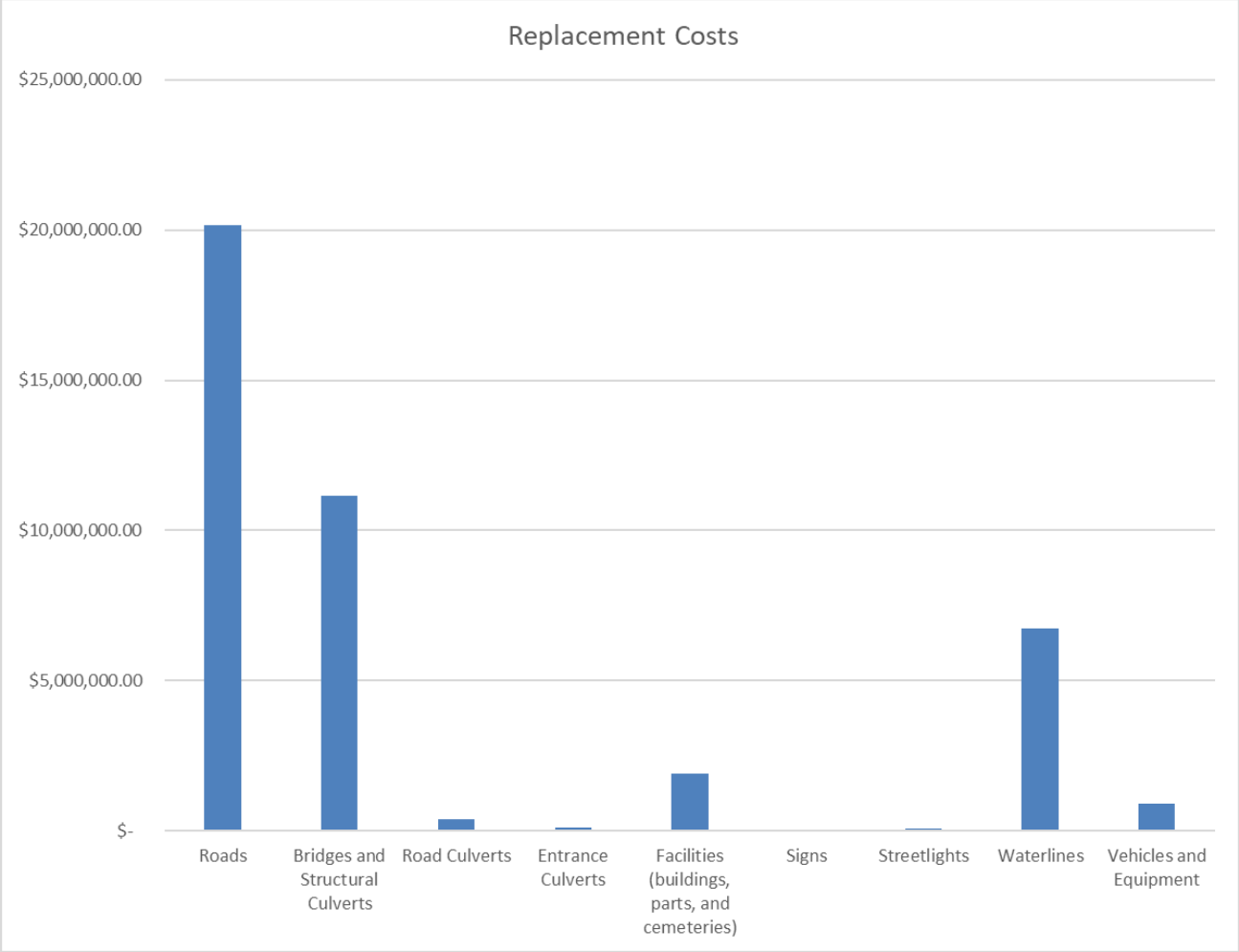
The following assets are included in this asset management plan:

Table 1-1

Asset Classes and Replacement Costs

Asset Class	Replacement Costs
Roads	$ 20,168,645.90
Bridges and Structural Culverts	$ 11,160,451.77
Road Culverts	$ 395,950.66
Entrance Culverts	$ 105,633.04
Facilities (buildings, parts, and cemeteries)	$ 1,921,529.84
Signs	$ 41,850.00
Streetlights	$ 71,000.00
Waterlines	$ 6,727,704.62
Vehicles and Equipment	$ 890,929.91
Total	**$ 41,483,695.73**

Figure 1-1



The Municipality's goals and objectives with respect to asset management are identified in the Municipality's Strategic Asset Management Policy. A major theme within that policy is for the Municipality's physical assets to be managed in a manner that will support the sustainable provision of municipal services to Municipality residents. Through the implementation of the asset management plan, the Municipality's practice should evolve to provide services at levels proposed within this document. Moreover, infrastructure and other capital assets should be maintained at condition levels that provide a safe and functional environment for its residents. Therefore, the asset management plan and the progress with respect to its implementation will be evaluated based on the Municipality 's ability to meet these goals and objectives. Ultimately it is the taxpayers of the municipality that contribute to the replacement of these assets. The following table illustrates that given our small population the cost/household is very high.

1.2 Legislative Context for the Asset Management Plan

Asset management planning in Ontario is continuously changing. Before 2009, capital assets were recorded by municipalities as expenditures in the year of acquisition or construction. The long-term

issue with this approach was the lack of a capital asset inventory, both in the municipality's accounting system and financial statements. As a result of revisions to section 3150 of the Public Sector Accounting Board handbook, effective for the 2009 fiscal year, municipalities were required to capitalize tangible capital assets, thus creating an inventory of assets. In 2012, the province launched the Municipal Infrastructure Strategy. As part of that initiative, municipalities and local service boards seeking provincial funding were required to demonstrate how any proposed project fits within a detailed asset management plan. In addition, asset management plans encompassing all municipal assets needed to be prepared by the end of 2016 to meet Federal Gas Tax agreement requirements. To assist in defining the components of an asset management plan, the Province produced a document entitled Building Together: Guide for Municipal Asset Management Plans. This guide documented the components, information, and analysis that were required to be included in municipal asset management plans under this initiative. The province's Infrastructure for Jobs and Prosperity Act, 2015 (IJPA) was proclaimed on May 1, 2016. This legislation detailed principles for evidence-based and sustainable long-term infrastructure planning. The Infrastructure for Jobs and Prosperity Act 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 Infrastructure for Jobs and Prosperity Act. The intent of O.Reg. 588/17 is to establish a standard format for municipal asset management plans. Specifically, the regulations require that asset management plans be developed that define the current and proposed levels of service, identify the lifecycle activities that would be undertaken to achieve these levels of service, and provide a financial strategy to support the levels of service and lifecycle activities. This plan has been developed to address the requirements of O. Reg. 588/17 utilizing the best information available to the Municipality at this time. With the impact of the COVID 19 pandemic the regulatory timelines associated with O. Reg 588/17 were amended as followed:

- July 1, 2022 (previously July 1, 2021): Date for municipalities to have an approved asset management plan for core assets (roads, bridges and culverts, water, wastewater and stormwater management systems) that identifies current levels of service and the cost of maintaining those levels of service.
- July 1, 2024 (previously July 1, 2023): Date for municipalities to have an approved asset management plan for all municipal infrastructure assets that identifies current levels of service and the cost of maintaining those levels of service.
- July 1, 2025 (previously July 1, 2024): Date for municipalities to have an approved asset management plan for all municipal infrastructure assets that builds upon the requirements set out in 2024. This includes an identification of proposed levels of service, what activities will be required to meet proposed levels of service, and a strategy to fund these activities.

1.3 Asset Management Plan Development

The asset management plan was developed using a program that leverages the Municipality's asset management principles as identified within its strategic asset management policy, capital asset database information, and staff input in identifying current and proposed levels of service, as well as proposed asset management strategies. The development of the Municipality's asset management plan is based on the steps summarized below:

1. Compile available information pertaining to the Municipality's capital assets to be included in the plan, including attributes such as size/material type, useful life, age, and current valuation. Update current valuation, where required, using benchmark costing data or applicable inflationary indices.
2. Define and assess current asset conditions, based on a combination of Municipality staff input, existing asset reports, and an asset age-based condition analysis.
3. Define and document current levels of service, as well as proposed levels of service, based on discussions with Municipal Council and staff, and consideration of various background reports.
4. Develop an asset management strategy that provides the activities required to sustain the levels of service discussed above. The strategy summarizes these activities in the forecast of annual capital and operating expenditures required to achieve these level of service outcomes.
5. Develop a financing strategy to support the lifecycle management strategy. The financing plan informs how the capital and operating expenses arising from the asset management strategy will be funded over the forecast period.
6. Document the comprehensive Asset Management Plan in a formal report to inform future decision-making and to communicate planning to municipal stakeholders.

1.4 Maintaining and Integrating the Asset Management Plan

It should be noted, that while this report covers a forecast period of 20 years, the full lifecycle of the Municipality's assets were considered in the calculations. In this context, the asset management plan should be updated as the strategic priorities and capital needs of the Municipality change. This can be accomplished in conjunction with specific legislative requirements (i.e. 5-year review of asset management plan under Infrastructure for Jobs and Prosperity Act), as well as the Municipality's annual budget process. Further integration into other Municipality financial/planning documents would assist in ensuring the ongoing accuracy of the asset management plan, as well as the integrated financial/planning documents.

2 State of Local Infrastructure and Levels of Service

2.1 Introduction

This section provides an analysis of the Municipality's assets, the current service levels provided by those assets, and the service levels the Municipality intends to deliver into the future.

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

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

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

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

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

2.2 Roads

2.2.1 State of Local Infrastructure

The Municipality currently owns and manages 71.48 centreline kilometres of road assets with a 2022 replacement value totaling approximately $20,168,645. The replacement value has been estimated based on the replacement costs, as identified in the Lifecycle Management Strategy section of this report. The road network consists of roads with various surface types, including surface treatment and gravel. These assets reside in urban and rural roadside environments.

Table 2-1,

Figure 2-1 and Figure 2-2 provide a breakdown of the road network by surface type and roadside environment. The entirety of the road network, on average, is 8 years old. There are relatively few Surface Treated Roads in the network, with most of the road network consisting of gravel roads. In the context of roadside environment, most of the network is comprised of rural roads.

Table 2-1

Roads – Surface Type

Surface Type	Area	Centreline Kilometres	Age (Weighted Average)	Replacement Costs
Surface Treatment	Urban	3.12	10	$ 1,595,854.99
	Rural	0.43		$ 220,294.59
Gravel	Urban	7.25	7	$ 1,961,129.28
	Rural	60.68		$ 16,391,367.04
TOTAL		**71.48**	**8**	**$ 20,168,645.90**

Figure 2-1

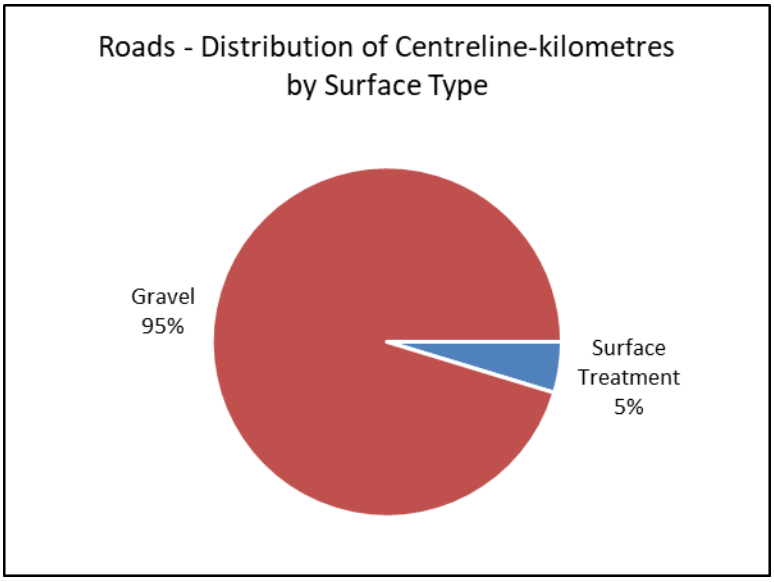


Figure 2-2

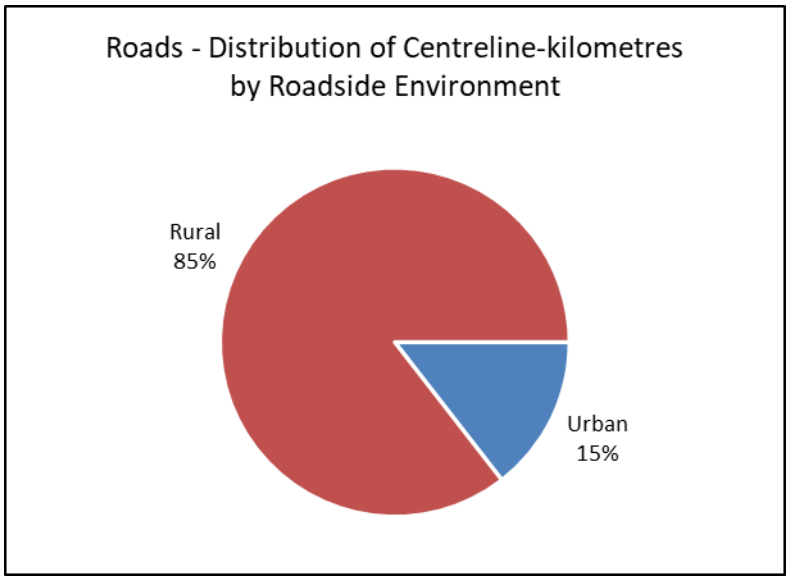
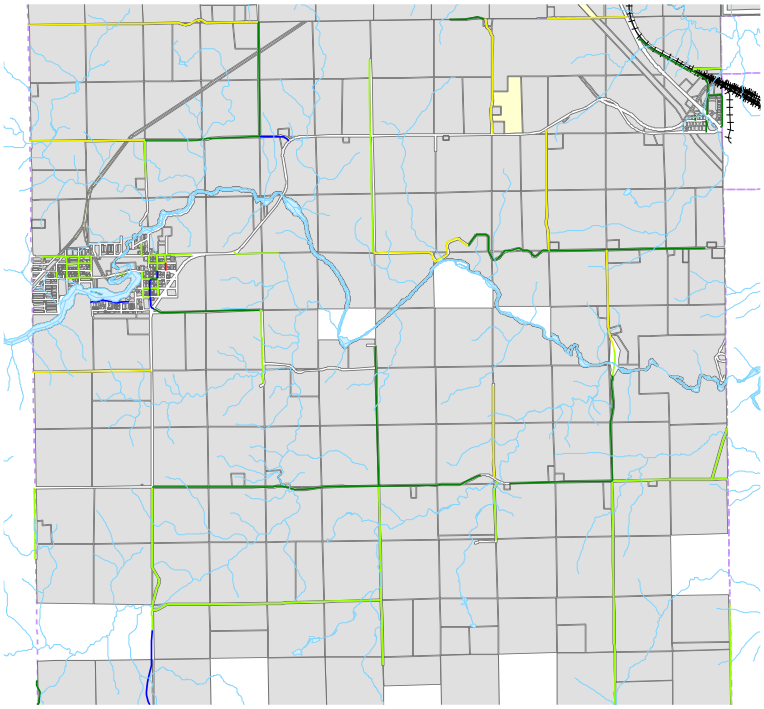


Figure 2-3

Map – Road Network



2.2.2 Condition

While asset age may provide some limited context to the functional state of an asset, an assessed physical condition is a better measure of where an asset is in its lifecycle. Physical condition therefore provides a more accurate estimate of an asset's remaining service life. The Municipality's Public Works Department undertook a 2022 review of the physical condition rating for each road segment in the network. Updates are included in the plan when major investments have taken place. This physical condition rating is provided on a scale of 0-100, with 100 being a perfect condition and 0 indicating an asset at the end of its service life. To better communicate the condition of the road network, these numeric condition ratings have been segmented into qualitative condition states. Table 2-2 summarizes the various physical condition ratings and the condition state they represent for road assets.

Table 2-2

Road Condition States Defined with Respect to Physical Condition

Physical Condition – Beginning	Physical Condition – Ending	Condition State	Condition Definition	Length (Km)
1	39	Poor	Widespread signs of deterioration, some assets may be unusable. Service is affected.	3.4
40	59	Fair	Some elements exhibit significant deficiencies, Asset requires attention.	14.1
60	79	Good	Good condition, few elements exhibit existing deficiencies.	32.0
80	100	Very Good	Well maintained, good condition, new or recently rehabilitated.	22.0

Table 2-3

Roads – Illustration of Condition State

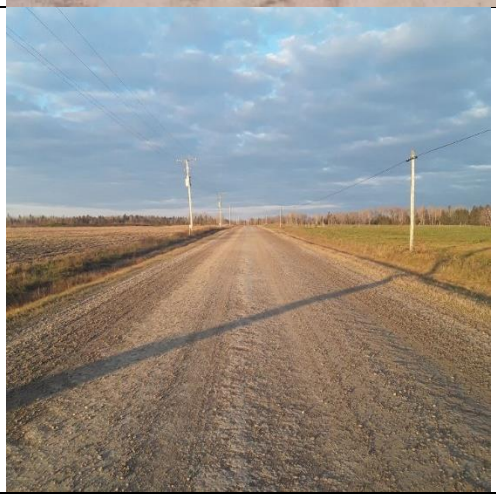
State	Gravel	Surface Treatment
Poor		
Very Good		

Table 2-4 examines the average condition of the road network by surface type. Adjustments to the physical condition are performed based on the lifecycle degradation or set to known values when capital improvements are completed (i.e. rehabilitation or replacement activities being performed). The physical condition ratings utilized in this plan are from 2022 and represent the most up-to date information available to the Municipality at this time.

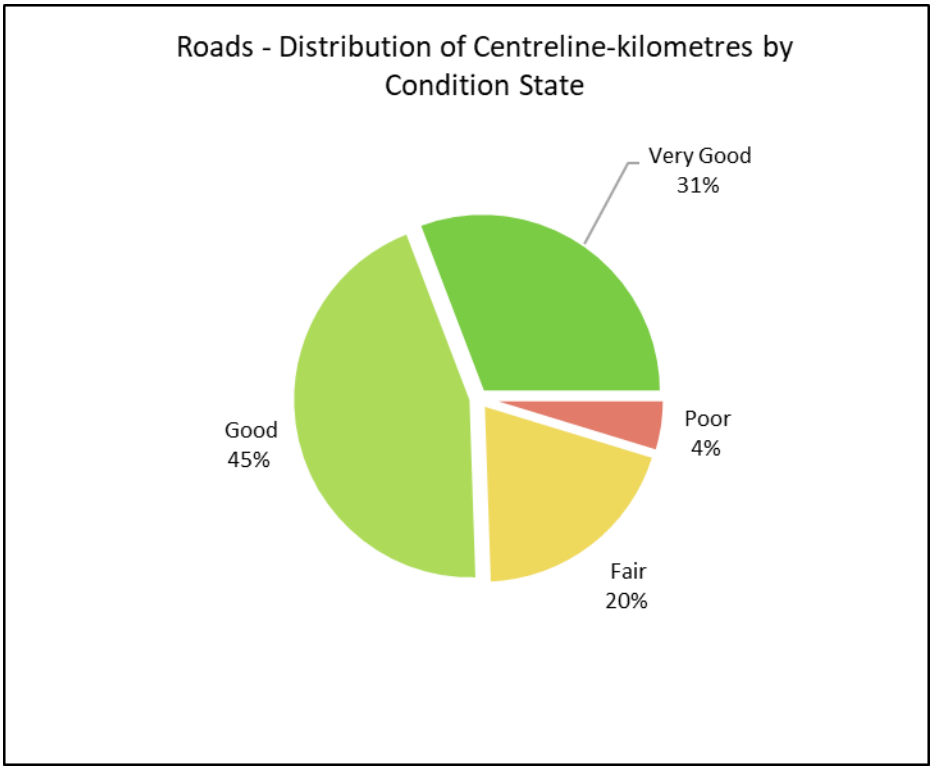
As illustrated in Table 2-4, surface treatment roads are “Good” in the Urban areas and “Poor” in the Rural areas on average. While gravel roads are in a “Good” condition state in both Urban and Rural areas on average. Assessed across the entire road network, all road segments are at an average physical condition rating of 57.92, or currently in a “Fair” condition state.

Table 2-4

Road Condition Analysis

Surface Type	Area	Centreline Kilometres	Physical Condition	Average Condition State
Surface Treatment	Urban	3.12	72.81	Good
	Rural	0.43	24.70	Poor
Gravel	Urban	7.25	67.90	Good
	Rural	60.68	66.26	Good
TOTAL		**71.48**	**57.92**	Fair

Figure 2-4



2.2.3 Current and Proposed Levels of Service

The levels of service currently provided by the Municipality's road network is, in part, a result of the state of local infrastructure identified above. Road assets have prescribed levels of service reporting requirements under O. Reg. 588/17. These requirements include levels of service reporting from two different levels, i.e. community levels of service and technical levels of service. Community levels of service objectives describe service levels in terms that customers understand and reflect their scope and quality expectations of the road network. Technical levels of service describe the scope and quality of Municipality roads through performance measures that can be quantified, evaluated, and detail how effectively a municipality provides services. Table 2-5 presents the current levels of service measures as mandated by O. Reg. 588/17.

Table 2-5

Road Current Levels of Service – O. Reg. 588/17

Levels of Service Category	**Service Attribute**	**Current Levels of Service**	**Performance**
Community Levels of Service	Scope	Municipal Roads are utilized by passenger vehicles, emergency vehicles, pedestrians, cyclists, farm equipment and heavy transport vehicles.	
	Quality	Table 2-2 details how road physical condition is segregated into qualitative condition states. Roads in a poor, or worse, condition state could face possible load restrictions or access issues.	
Technical Levels of Service	Scope	Number of lane-kilometres of each of arterial roads, collector roads and local roads as a proportion of square kilometres of land area of the municipality.	1.55
	Quality	1. For paved roads in the municipality, the average pavement condition index value. 2. For unpaved roads in the municipality, the average surface condition (e.g. excellent, good, fair or poor).	1. 66 (Good) 2. 67 (Good)

The scope of our municipality shows local roads as a proportion of square kilometres of land as 1.55 with paved coming in at a PCI of 66 (Good) and unpaved coming in with a GCI of 67 (Good).

As noted earlier, municipal asset management plans must identify both the existing and proposed levels of service for each asset category. Discussions with Municipality staff have formalized the proposed levels of service objectives. These technical levels of service are provided in the form of minimum acceptable levels of service for road assets. These minimum technical levels of service criteria have been designed to indicate the lowest physical condition any road in the Municipality should reach before an intervention or activity is performed to improve the road's condition. Furthermore, the minimum technical levels of service have been stratified into distinct expected levels of service objectives based on the road classifications identified in O. Reg. 239/02: Minimum Maintenance Standards (MMS) for Municipal Highways. O. Reg. 239/02 classifies roads based on their average daily traffic and speed limits and ultimately assigns a numerical score (1 to 6), where a lower number signifies a more heavily travelled road and/or a higher speed limit road. Table 2-6 details the Municipality's proposed technical levels of service, in terms of minimum expected physical condition, for road classifications as defined in O. Reg. 239/02.

The higher proposed levels of service on class 4 roads signals the relatively higher importance of these roads by the Municipality.

Table 2-6

Roads Proposed Levels of Service

MMS Road Class	Minimum Physical Condition
4	80
5	70
6	60
Seasonal	40

Alpine Road

Campbell's Road

- Crooked Cross Road North
- Lakeshore Avenue
- Macphersons Road
- Main Street
- Main Street P2
- Palmateer Road G2
- Palmateer Road P1
- Pit Road
- Richard Street P1
- River Road G1
- River Road G3
- River Road P1

- Rock Street
- Sprucegrove Road G3
- Sprucegrove Road G4
- Stoney Lonesome Road G1
- Stoney Lonesome Road G2
- Storybook Road G2
- Sutton's Road

Table 2-7 details what proportion of the road network falls below the proposed technical levels of service objectives, by surface type and MMS road classification. The Class 4 surface treatment and gravel roads both fail to meet the proposed levels of service. All other road assets by surface type and MMS road classification have no roads that fail to meet the proposed technical levels of service objectives. Twenty-one road sections currently do not meet their proposed standard including:

- Alpine Road
- Campbell's Road
- Crooked Cross Road North
- Lakeshore Avenue
- Macphersons Road
- Main Street
- Main Street P2
- Palmateer Road G2
- Palmateer Road P1
- Pit Road
- Richard Street P1
- River Road G1
- River Road G3
- River Road P1
- Rock Street
- Sprucegrove Road G3
- Sprucegrove Road G4
- Stoney Lonesome Road G1
- Stoney Lonesome Road G2
- Storybook Road G2
- Sutton's Road

Table 2-7

Roads Proposed Levels of Service

Road Surface	MMS Road Class	Centreline Kilometres	Proposed Level of Service	Physical Condition (Weighted Average)	Average Condition State	Lowest Level of Service	% of Km's Less than Proposed Level of Service
Surface Treatment	4	0.79	80	52	Fair	25	100%
	5	2.17	70	76	Good	50	48%
	6	0.59	60	58	Fair	29	19%
Gravel	4	25.79	80	74	Good	50	43%
	5	2.17	70	95	Very Good	90	0%
	6	34.14	60	66	Good	45	26%
	Seasonal	5.83	40	46	Fair	0	49%
TOTAL		**71.48**	**n/a**	**67**	Good	**0**	

2.3 Bridges and Structural Culverts

2.3.1 State of Local Infrastructure

The Municipality currently owns and manages 1 bridge and 3 major culverts, with a 2022 replacement value totaling approximately $11,160,451. The replacement value has been estimated based on inflating installation costs from the original purchase price. Table 2-8 provides a summary of count, age, and replacement value for the current bridge and culvert network. The average age of the Municipality's bridges and culverts is just over 40 years, with the bridge averaging 45 years, compared to culverts averaging 40 years.

Table 2-8

Bridge Network –Type

Type	Quantity	Age (Weighted Average)	Replacement Cost
Bridge	1	45	$ 7,482,538.94
Culvert	3	40	$ 3,677,912.83
TOTAL	**4**	**40**	**$ 11,160,451.77**

Figure 2-5

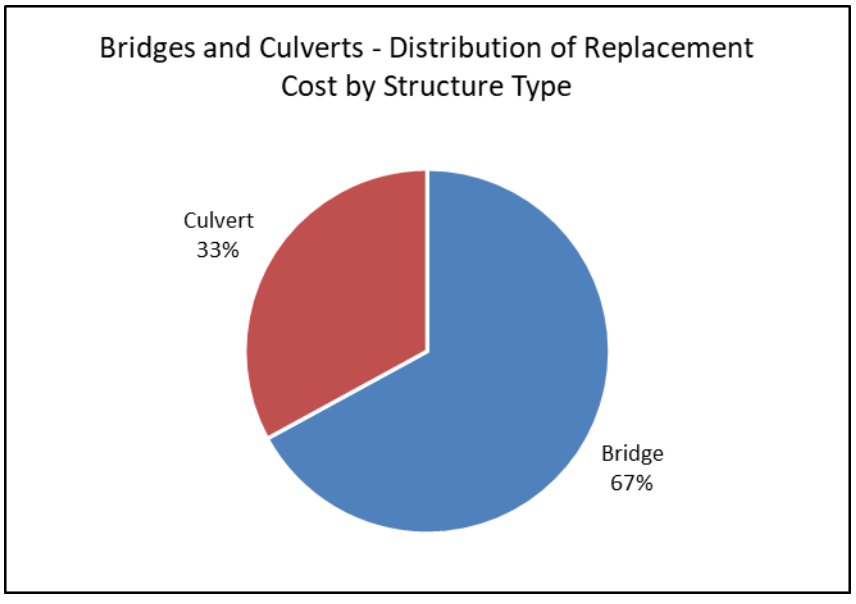
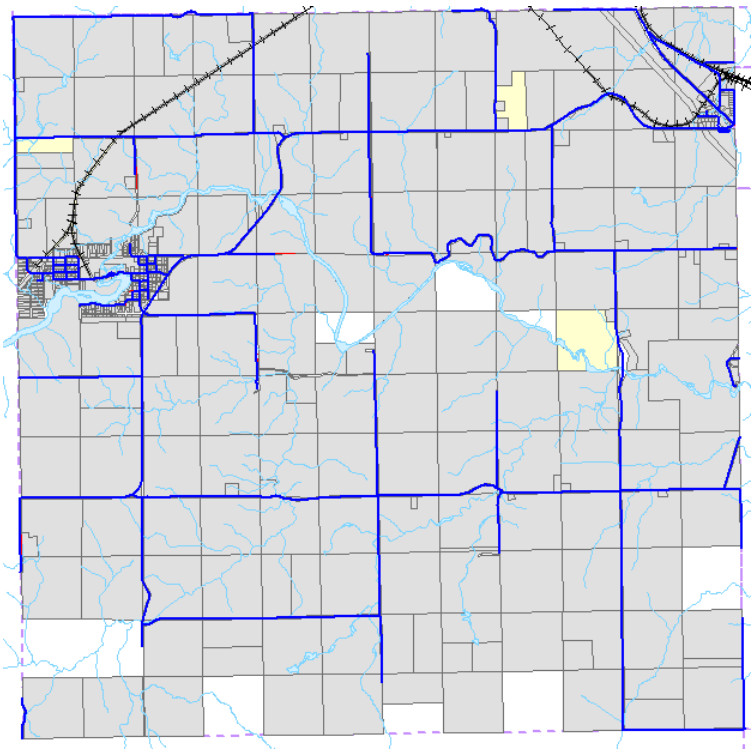


Figure 2-6

Map- Bridges and Culverts



2.3.2 Condition

The Municipality's OSIM report assessed the condition of the bridge and culvert network, applying a bridge condition index (BCI) for assets. A BCI score is provided on a numeric scale of 0-100, and is a measure of the overall condition of the structure based on an evaluation of individual components. Similar to road assets, to better communicate the condition of the bridge and culvert network, the numeric condition ratings have been segmented into qualitative condition states as summarized

Table 2-9.

Table 2-9

Bridge and Culvert Condition States Defined with Respect to BCI

Physical Condition – Beginning	Physical Condition – Ending	Condition State	Condition Description	Replacement Cost
0	60	Poor	Widespread signs of deterioration, some assets may be unusable. Service is affected.	$2,631,712.24
61	75	Fair	Some elements exhibit significant deficiencies, Asset requires attention.	$8,528,739.52
75	90	Good	Good condition, few elements exhibit existing deficiencies.	$ -
90	100	Very Good	Well maintained, good condition, new or recently rehabilitated.	$ -

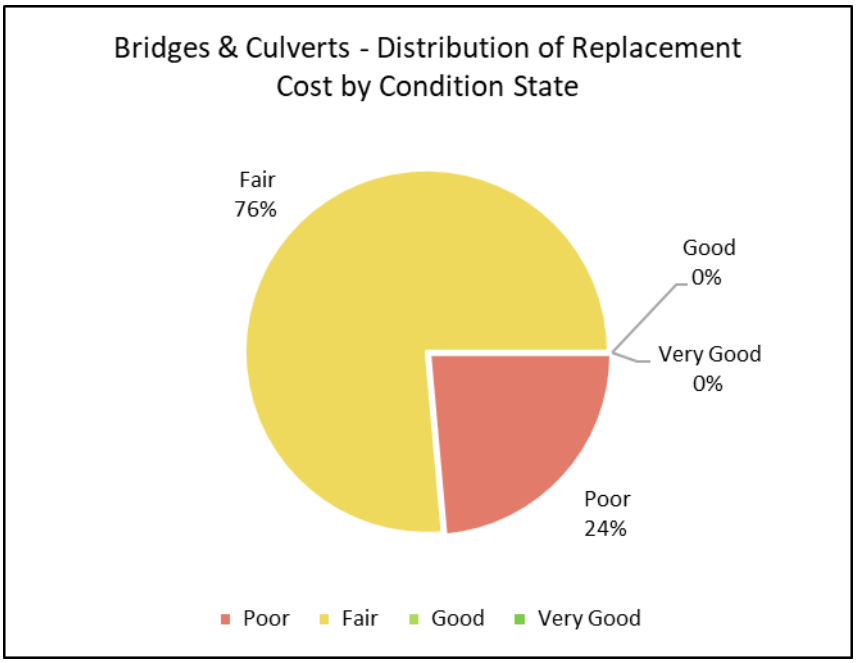
As summarized in Table 2-10, our bridge is, on average, in a "Fair" condition state, while culverts are in a "Poor" condition state. Assessed for the entire bridge and culvert network, all structures provide an average BCI of 61, representing a "Fair" condition state. The lowest observed condition in the bridge network is 69 (Fair), and for culverts is 34 (Poor). The Storybook Road Culvert and the Brentha Road Culvert West are both listed in Poor condition with the River Road Bridge and the Brentha Road East Culvert rated as Fair. All of these assets were installed in a narrow six-year date range between 1977 and 1983.

Table 2-10

Bridge and Culvert Condition Average

Type	Quantity	BCI (Weighted Average)	Minimum Observed BCI	Average Condition State
Bridge	1	69	69	Fair
Culvert	3	44	34	Poor
TOTAL	**4**	**60.7**	**34**	Fair

Figure 2-7



2.3.3 Current Levels of Service

The levels of service currently provided by the Municipality's bridge and culvert network is, in part, a result of the state of local infrastructure identified above. Bridge and culvert assets have prescribed levels of service reporting requirements under O. Reg. 588/17. These requirements include levels of service reporting from two different levels, i.e. community levels of service and technical levels of service. Community levels of service objectives describe service levels in terms that customers understand and reflect their scope and quality expectations of the bridge and culvert network. Technical levels of service describe the scope and quality of Municipality bridges and culverts through performance measures that can be quantified, evaluated, and detail how effectively a municipality provides services. Table 2-11 presents the current levels of service as mandated by O. Reg. 588/17.

Table 2-11

Bridge and Culvert Current Levels of Service – O. Reg. 588/17

Levels of Service Category	Service Attribute	Current Levels of Service
Community Levels of Service	Scope	Bridges and Culverts are utilized by passenger vehicles, emergency vehicles, pedestrians, cyclists, farm equipment and heavy transport vehicles.

	Quality	Table 2-9 details how BCI is segregated into qualitative condition states. Bridges or culverts in a poor, or worse, condition state could face possible load restrictions.
Technical Levels of Service	Scope	None of the Municipality's bridges and culverts currently have load or dimensional restrictions.
	Quality	Table 2-10 summarizes the average condition of the Municipality's bridge and culvert network.

2.3.4 Proposed Levels of Service

As noted earlier, municipal asset management plans must identify both the existing and proposed levels of service for each asset category. The previous subsection described the current levels of service being provided by the Municipality's bridges. This subsection will define the proposed levels of service for these assets.

Discussions with Municipality staff have formalized the proposed levels of service objectives. These technical levels of service are provided in the form of minimum acceptable levels of service for bridge and structural culvert assets. The Municipality has a relatively few number of bridge and structural culverts and is proposing to maintain the existing access. Closures of any of these assets would result in unacceptable and dangerous detouring of emergency vehicles for much of the population. Due to the importance of these assets the municipality strives to maintain the structures with at least a 75 or Good rating. Currently, all bridge and structural culvert assets are not meeting the desired level of service.

2.4 Road Culverts

2.4.1 State of Local Infrastructure

The Municipality currently owns and maintains 194 culverts with a 2022 replacement value totaling approximately $395,950. The replacement value has been estimated based on the replacement costs, as gathered from an Inglis Farm Drainage Inc. cost sheet. Assessed across the entire network our culverts have an average age of 21 years.

Table 2-12

Culvert Network - Location

Culvert Location	Quantity	Age (Weighted Average)	Replacement Cost
Urban	52		$ 79,971.00
Rural	142		$ 315,979.66
TOTAL	**194**	**21**	**$ 395,950.66**

Figure 2-8

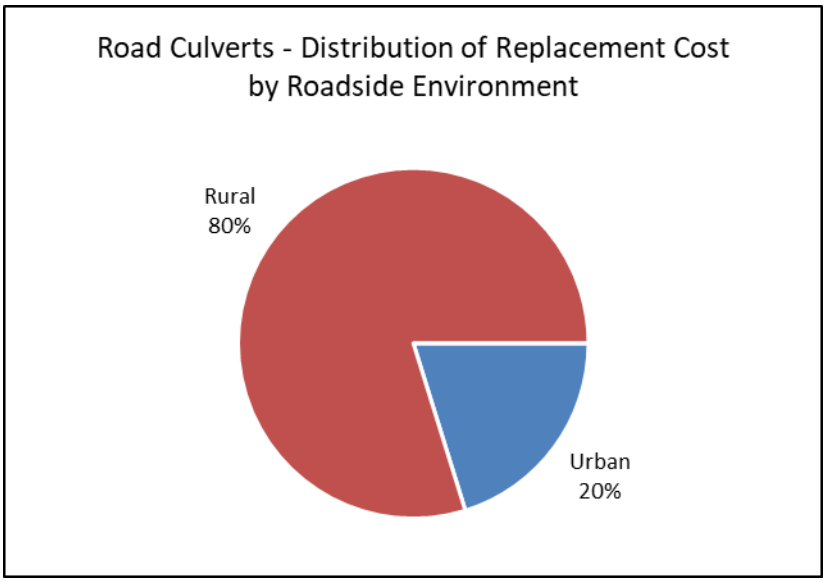


Table 2-13

Culvert Network – Material Type

Culvert Type	Quantity	Age (Weighted Average)	Replacement Cost
Metal	147		$336,298
Cement	1		$12,623
Plastic	45		$46,541
TOTAL	**194**	**21**	**$395,951**

Figure 2-9

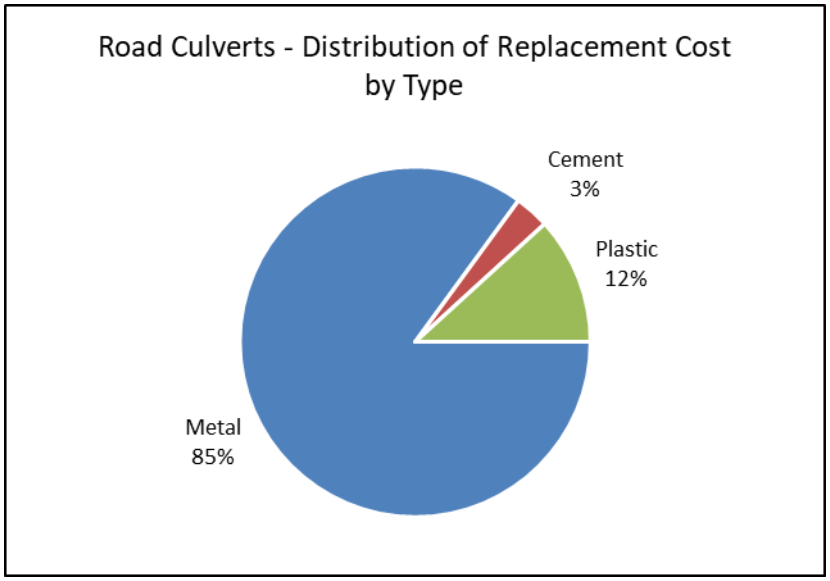


Table 2-14

Culvert Network - Size

Culvert Diameter	Quantity	Age (Weighted Average)	Replacement Cost
<=375mm (15 inches)	60		$32,637
375 mm - 750 mm	104		$137,877
>750 mm (30 inches)	30		$225,437
TOTAL	**194**	**21**	**$395,951**

Figure 2-10

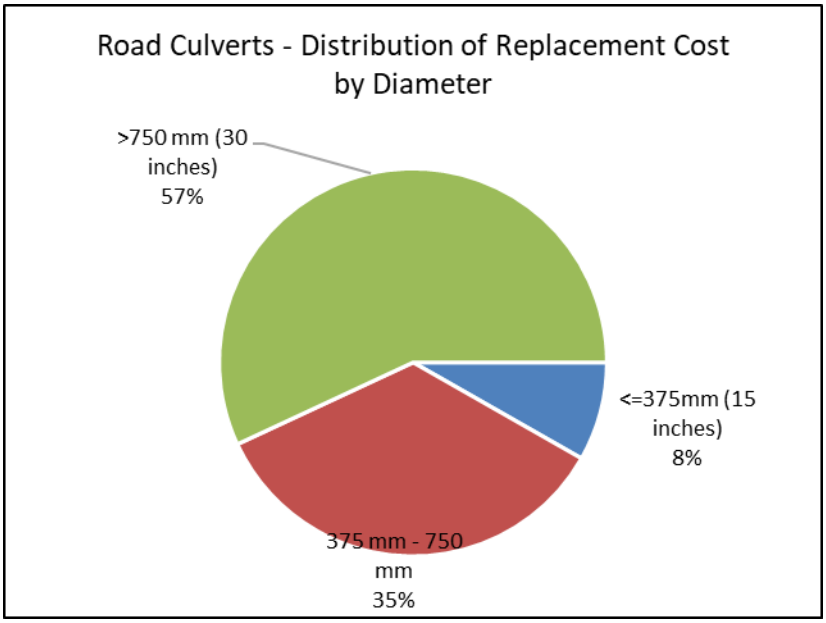
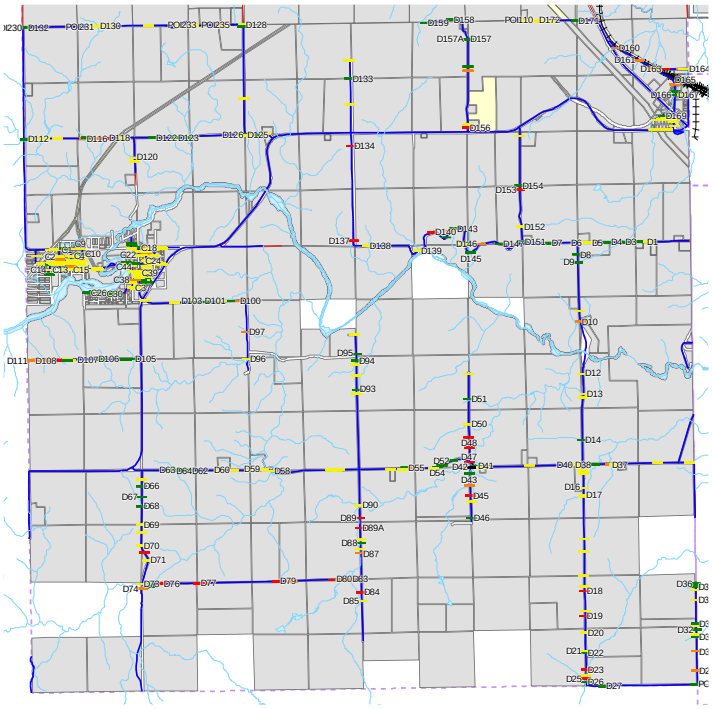


Figure 2-11

Map- Road Culverts



2.4.2 Condition

While asset age may provide some limited context to the functional state of an asset, an assessed physical condition is a better measure of where an asset is in its lifecycle. Physical condition therefore provides a more accurate estimate of an asset's remaining service life. The Public Works Department assessed our Culvert Network in 2016. As replacements are made a physical condition rating is provided on a scale of 1-4, with 4 being a perfect condition and 1 indicating an asset at the end of its service life. To better communicate the condition of the culvert network, these numeric condition ratings have been segmented into qualitative condition states.

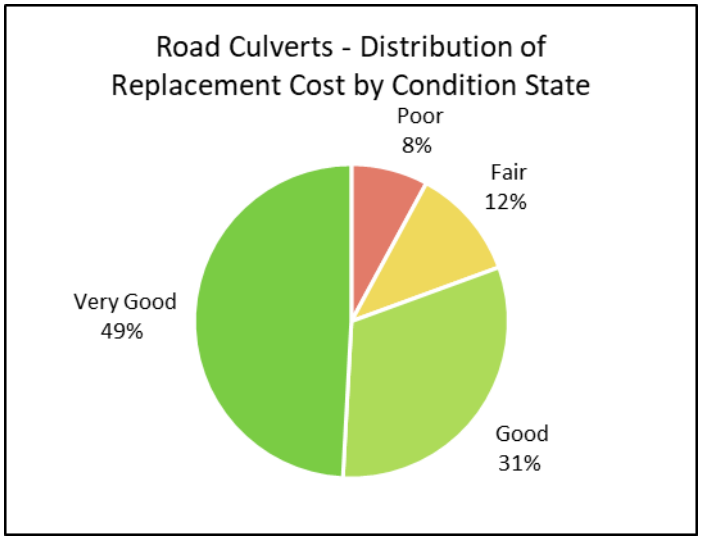
Table 2-15 summarizes the various physical condition ratings and the condition state they represent for culvert assets. There are 26 culverts in poor condition and 25 culverts in the fair condition.

Table 2-15

Culvert Condition States Defined with Respect to Physical Condition

Physical Condition	Condition State	Condition Definition	Replacement Value
1	Poor	Widespread signs of deterioration, some assets may be unusable. Service is affected.	$29,832
2	Fair	Some elements exhibit significant deficiencies, Asset requires attention.	$43,335
3	Good	Good condition, few elements exhibit existing deficiencies.	$118,577
4	Very Good	Well maintained, good condition, new or recently rehabilitated.	$185,212

Figure 2-12



2.4.3 Current Levels of Service

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

Table 2-16

Culvert Current Levels of Service

Levels of Service Category	Service Attribute	Current Levels of Service
Community Levels of Service	Scope	Culverts are utilized by passenger vehicles, emergency vehicles, pedestrians, cyclists, farm equipment and heavy transport vehicles.
	Quality	Table 2-12 details our culverts in qualitative condition states. Culverts in a poor, or worse, condition state could face possible load restrictions, access issues or localized flooding.
Technical Levels of Service	Scope	The figure above outlines Municipality's culvert network by surface type.
	Quality	The figure above summarizes the average condition of the Municipality's culvert network

2.4.4 Proposed Levels of Service

Discussions with Municipal staff have set out a proposed level of service to replace culverts as they enter the poor condition. If a project is completed on that section of roadway culverts may be replaced in the Fair or Good conditions based on the judgement of staff. Currently, 51 culverts fail to meet the proposed standard. The Municipality is also moving to plastic culverts from metal to help achieve a longer overall life for the assets.

Table 2-17

Number of Culverts by Condition State

Physical Condition	Condition State	Condition Definition	Number of Culverts
1	Poor	Widespread signs of deterioration, some assets may be unusable. Service is affected.	26
2	Fair	Some elements exhibit significant deficiencies, Asset requires attention.	25
3	Good	Good condition, few elements exhibit existing deficiencies.	59
4	Very Good	Well maintained, good condition, new or recently rehabilitated.	83

2.5 Entrance Culverts

2.5.1 State of Local Infrastructure

The Municipality currently owns and maintains 206 entrance culverts with a 2022 replacement value totaling approximately $105,633. The replacement value has been estimated based on the replacement costs, as gathered from an Inglis Farm Drainage Inc. cost sheet. The average age of entrance culverts is 12 years.

Table 2-18

Entrance Culverts – Material Type

Culvert Type	Quantity	Age (Weighted Average)	Replacement Cost
Metal	163		$87,046
Cement	2		$530
Plastic	41		$18,057
TOTAL	**206**	**12**	**$105,633**

Figure 2-13

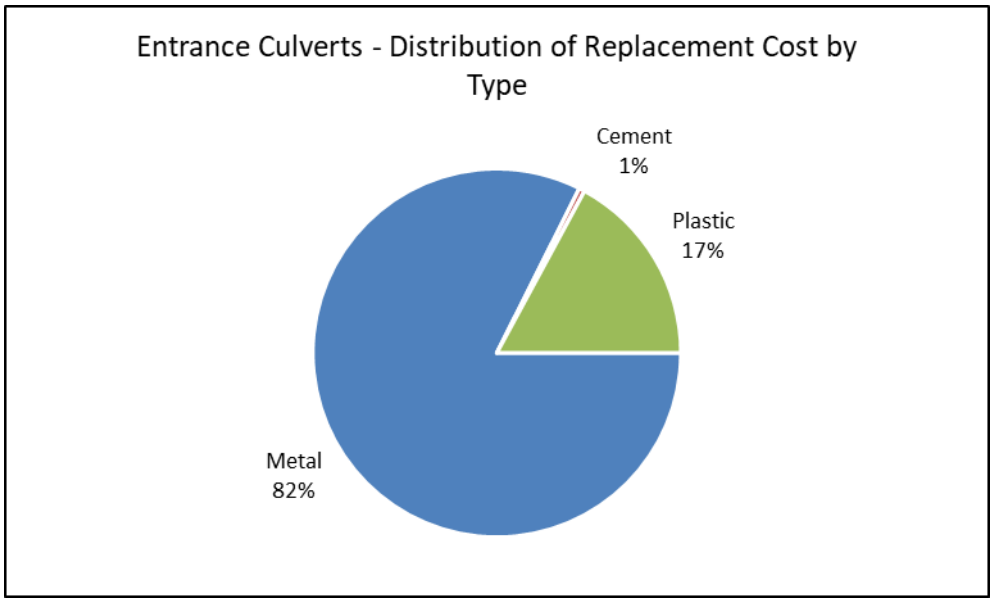
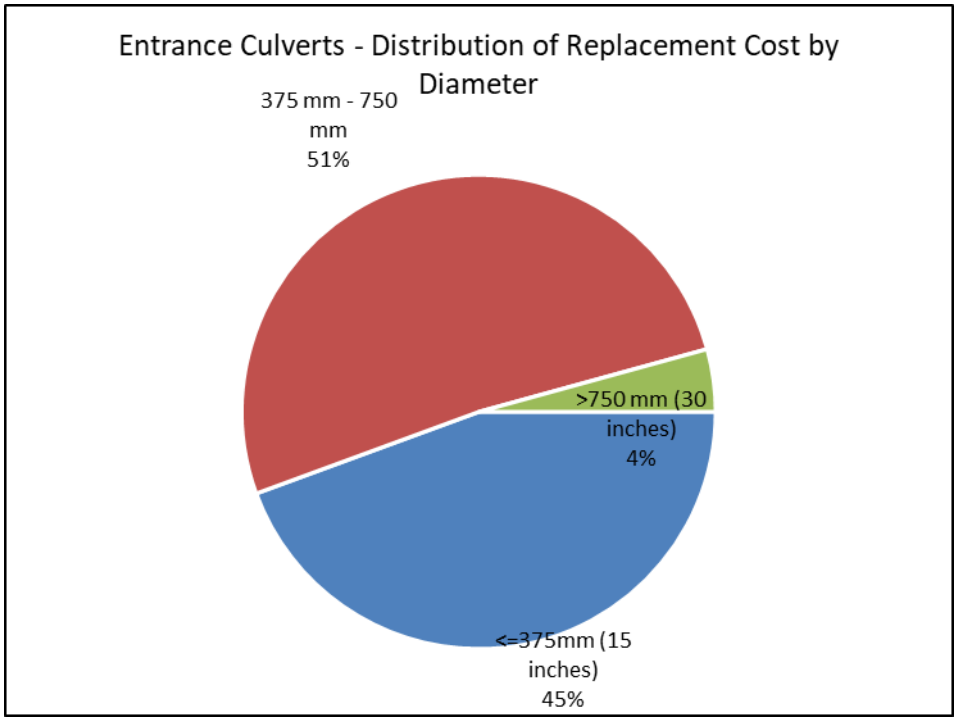


Table 2-19

Entrance Culverts - Size

Culvert Diameter	Quantity	Age (Weighted Average)	Replacement Cost
<=375mm (15 inches)	125		$46,908
375 mm - 750 mm	79		$54,215
>750 mm (30 inches)	2		$4,511
TOTAL	**206**	**12**	**$105,633**

Figure 2-14



2.5.2 Condition

While asset age may provide some limited context to the functional state of an asset, an assessed physical condition is a better measure of where an asset is in its lifecycle. Physical condition therefore provides a more accurate estimate of an asset's remaining service life. The Public Works Department

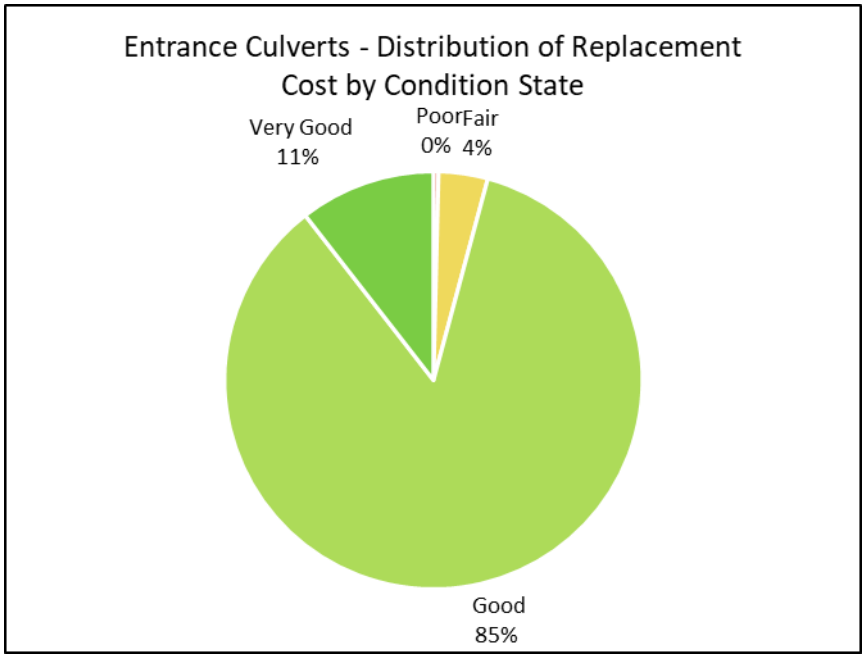
assessed our Culvert Network in 2016 and as replacements are made. A physical condition rating is provided on a scale of 1-4, with 4 being a perfect condition and 1 indicating an asset at the end of its service life. To better communicate the condition of the culvert network, these numeric condition ratings have been segmented into qualitative condition states. Table 2-20 summarizes the various physical condition ratings and the condition state they represent for culvert assets.

Table 2-20

Culvert Condition States Defined with Respect to Physical Condition

Physical Condition	Condition State	Condition Definition	Replacement Value
1	Poor	Widespread signs of deterioration, some assets may be unusable. Service is affected.	$419
2	Fair	Some elements exhibit significant deficiencies, Asset requires attention.	$4,061
3	Good	Good condition, few elements exhibit existing deficiencies.	$91,126
4	Very Good	Well maintained, good condition, new or recently rehabilitated.	$11,244

Figure 2-15



Comparing by material type most of the municipalities entrance culverts are comprised of metal. As replacements occur the municipality has been using plastic piping where possible. The average condition of metal culverts is 3.02 (Good) with a higher 3.28 (Good) rating for the plastic culvert group. Overall, the entrance culvert network has a “Good” condition state.

The municipality has also broken its culvert network into three size groups. The smallest group with 125 culverts has a 2.96 (Fair) rating and a minimum condition of 1. The middle group with 82 culverts has a 3.15 (Good) rating and a minimum condition of 3. The largest group with 2 culverts has a 3.00 (Good) rating and a minimum condition of 3.

2.5.3 Current Levels of Service

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

Table 2.5

Culvert Current Levels of Service

Levels of Service Category	Service Attribute	Current Levels of Service
Community Levels of Service	Scope	Culverts are utilized by passenger vehicles, emergency vehicles, pedestrians, cyclists, farm equipment and heavy transport vehicles.
	Quality	Table 2-12 details our culverts in qualitative condition states. Culverts in a poor, or worse, condition state could face possible load restrictions, access issues or localized flooding.
Technical Levels of Service	Scope	Figure 2-15 depicts the Municipality’s culvert network by surface type
	Quality	Figure 2-15 summarized the average condition of the Municipality’s culvert network

2.5.4 Proposed Levels of Service

Discussions with Municipal staff have set out a proposed level of service to replace culverts as they enter the poor condition. If a project is completed on that section of roadway culverts may be replaced in the Fair or Good conditions based on the judgement of staff. Currently, 13 culverts fail to meet the proposed standard.

Table 2-21

Entrance Culverts – Condition State

Physical Condition	Condition State	Condition Definition	Number of Culverts
1	Poor	Widespread signs of deterioration, some assets may be unusable. Service is affected.	1
2	Fair	Some elements exhibit significant deficiencies, Asset requires attention.	12
3	Good	Good condition, few elements exhibit existing deficiencies.	177
4	Very Good	Well maintained, good condition, new or recently rehabilitated.	19

2.6 Facilities

2.6.1 State of Local Infrastructure

The Municipality currently owns and manages 6 buildings, 4 parks, and 3 cemeteries, with a 2022 replacement value totaling approximately $1.9 million. Facilities assets range in cost from our Water Plant at $564,250 to the Brentha Cemetery at $2,771. A breakdown of facility asset numbers and replacement costs by category is provided in Table 2-22. Please note that for larger facilities the structure itself has not been included in the replacement costs.

Table 2-22

Facility – Average Age and Replacement Cost

Facility	Age (Weighted Average)	Replacement Cost
Municipal Office / Shop	15	$ 122,700.00
Heritage Centre	18	$ 103,100.00
Sand Shed	5	$ 150,000.00
Sign Shed	62	$ 50,000.00
Beach	9	$ 121,750.74
Janet Saunders Park	10	$ 366,594.42
Blackbridge Park	18	$ 340,161.70
Kevin Park	14	$ 20,546.18
Waste Site	14	$ 24,591.79
Charlton Cemetery	17	$ 46,183.57
St. Stephen Cemetery	29	$ 8,879.22
Brentha Cemetery	31	$ 2,771.38
Water Plant	16	$ 564,250.83
TOTAL	**17**	**$1,921,529.84**

2.6.2 Condition

The Municipality broke down the facilities into their individual assets to assess their condition. To make it easier to interpret conditions a four point scale as show in

Table 2-23 was used. Useful Life was broken down to exceed 100% to reflect that many assets may still be usable beyond their expected life and will be maintained until replacement makes sense.

Table 2-23

Facilities – Condition States

UL%	Condition State	Condition Definition	Replacement Value
140% ≤ UL%	Poor	Widespread signs of deterioration, some assets may be unusable. Service is affected.	$231,443
90% ≤ UL% < 140%	Fair	Some elements exhibit significant deficiencies, Asset requires attention.	$229,078
45% ≤ UL% < 90%	Good	Good condition, few elements exhibit existing deficiencies.	$614,205
UL% < 45%	Very Good	Well maintained, good condition, new or recently rehabilitated.	$846,805

2.6.3 Current Levels of Service

In terms of service, facilities require a more detailed analysis than other assets as they are more complex. Furthermore, there is no single dimension to evaluate performance. Some issues may be an immediate safety concern while others may be cosmetic. We currently have two facilities in poor condition – the Sign Shed and the Brentha Cemetery.

Table 2-24

Facilities – Average Condition State

Facility	% Life Used (Weighted Average)	Average Condition State	Annual Lifecycle Costs
Municipal Office / Shop	59%	Good	$ 21,566.81
Heritage Centre	66%	Good	$ 22,434.68
Sand Shed	10%	Very Good	$ 3,333.33
Sign Shed	310%	Poor	$ 50,000.00
Beach	41%	Very Good	$ 19,698.32
Janet Saunders Park	40%	Very Good	$ 82,723.20
Blackbridge Park	77%	Good	$ 149,933.69
Kevin Park	79%	Good	$ 6,924.36
Waste Site	68%	Good	$ 5,358.47
Charlton Cemetery	44%	Very Good	$ 6,211.28
St. Stephen Cemetery	58%	Good	$ 422.82
Brentha Cemetery	155%	Poor	$ 2,771.38
Water Plant	81%	Good	$ 225,825.60
TOTAL	**67%**	Good	**$ 597,203.96**

While there are few poor facilities there are assets in poor or fair condition. Broken down further the following assets are in Fair or Poor condition across the facilities:

Facility	Fair	Poor	Replacement Cost
Municipal Office / Shop	Refrigerator, Stove, Furnace & Hot Water Tank, Water Softener, Exhaust Fan	Shop Doors	$11,600
Heritage Centre	Interior Paint, Refrigerator, Desks and Tables, Signage, Front Deck	Air Conditioner	$10,300
Sand Shed	None	None	$0.00
Sign Shed	None	Structure	$50,000
Beach	Fencing, Bear Garbage Bins	None	$10,929

Janet Saunders Park	Bear Garbage Bins	Play Structure, Sun Shade Shelter, Hot Water Tank x 2	$70,275
Blackbridge Park	Retaining Wall, Bear Garbage Bins	Picnic Tables x 3	$122,834
Kevin Park	Bear Garbage Bins	Picnic Tables x 2	$4,200
Waste Site	None	None	$0.00
Charlton Cemetery	None	Shed	$5,000
St. Stephen Cemetery	None	None	$0.00
Brentha Cemetery	None	Gate	$2,771
Water Plant	Water Intake, Furnace 1, Furnace 2, Roof, Windows, Floors, Eavestroughs, Bear Garbage Bins	Turbidity Analyzer, Highlift Pump, Auto Sampler, Security System, Interior Painting, Exterior Painting, Air Exchanger, Hot Water Tank, Desks and Kitchenette, Sinks and Toilet, Signage, Outside Stairs	$169,609
TOTAL	**17**	**$1,896,633.90**	**$457,518**

2.6.4 Proposed Levels of Service

The Municipality is beginning with the items in poor condition and attempting to work with funding programs to target locations when possible. This is especially true in the recreational parks and the Water Plant where traditionally more funding programs are available. The Municipality is proposing to maintain their existing level of service where possible. If an item is considered unsafe such as playground equipment or a park shelter it will be removed or restricted until a suitable replacement can be funded. The Municipality has a goal of continuing to make its facilities fully accessible and investments in the facilities will work toward this goal.

2.7 Vehicles and Equipment

2.7.1 State of Local Infrastructure

The Municipality currently owns and manages 4 vehicles and 9 pieces of equipment, with a 2022 replacement value totaling approximately $890,929. This value represents a Shared Service Agreement with the Township of Chamberlain and shared equipment is only recorded at 50%. Please note that this does not include the Englehart and Area Fire Department equipment which is tracked separately. The replacement value has been based on inflating historical cost. Table 2-25 provides a summary of quantity, expected useful life, age, and replacement value of Municipality equipment assets. The average age of Unshared vehicles is 9 years and of Shared Vehicles is 12 years. The average age of Unshared equipment is 9years and of Shared equipment is 7 years. Overall, the municipality has vehicles and equipment with an average age of 8 years.

Table 2-25

Equipment Infrastructure Summary

Type	Agreement Type	# of Pieces	% Life Used (Weighted Average)	Age (Weighted Average)	Replacement Cost	Highest % Used	Average Condition State
Vehicle	Unshared	2	37%	9	$ 175,311.56	37%	Very Good
	Shared	2	69%	12	$ 44,927.88	85%	Good
Equipment	Unshared	3	23%	9	$ 503,755.74	29%	Very Good
	Shared	6	11%	7	$ 166,934.73	51%	Very Good
TOTAL		**13**		**8**	**$ 890,929.91**	**85%**	Very Good

Figure 2-16

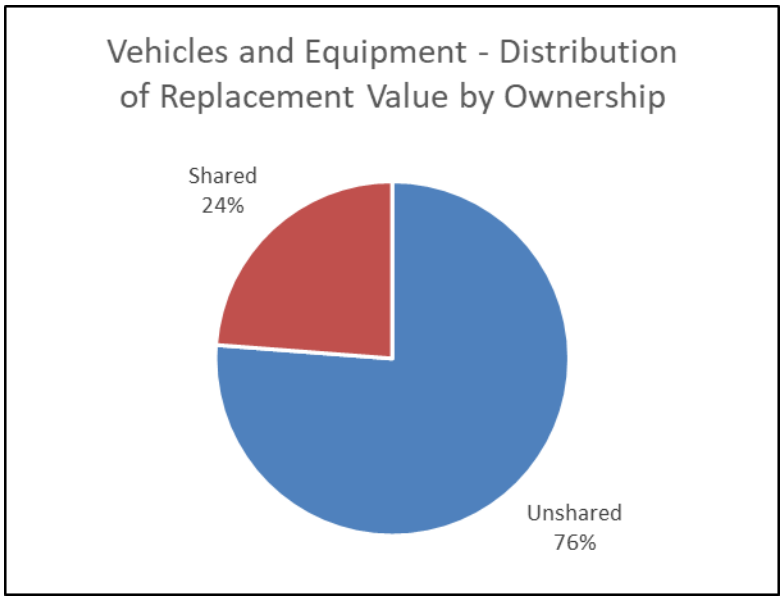
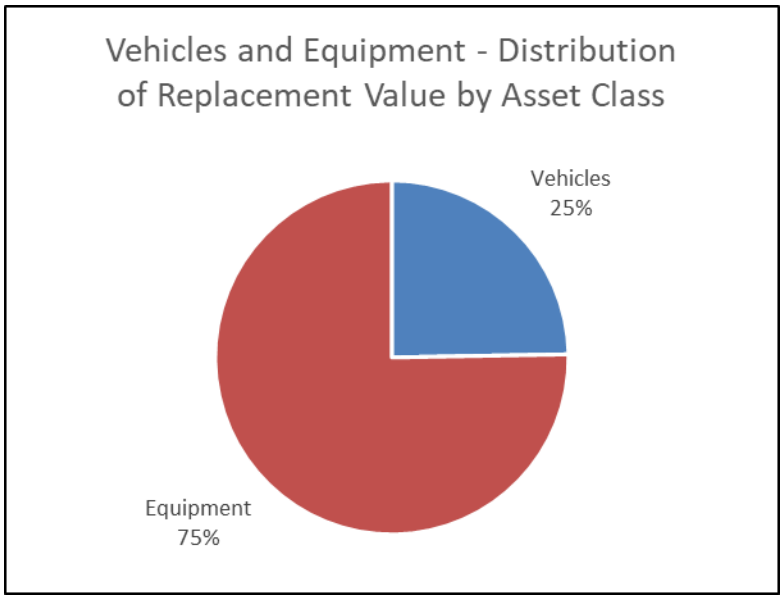


Figure 2-17



2.7.2 Condition

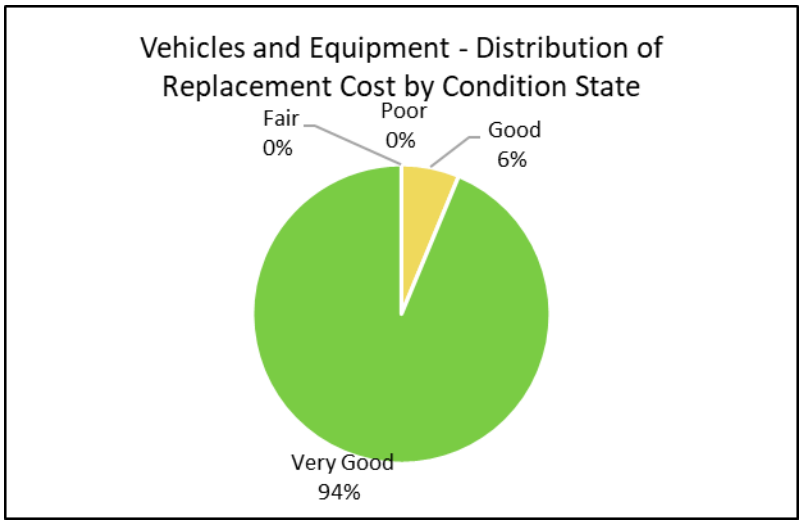
The Municipality currently only has the age of its fleet to inform condition. We have used a four class condition state to determine condition state with expected useful life that could exceed 100%. As presented, the average age of our fleet is 8 years, or a "Very Good" condition state. The next Unshared Vehicle up for replacement is the 2017 Chevrolet Pickup truck due for replacement in 2028 with a 2022 value of $64,945. The next Shared Vehicle up for replacement is the 2007 International Plow Truck due for replacement in 2025 with an estimated 2022 cost of $48,027 (Charlton Dack responsible for 50%). The next Unshared Equipment up for replacement is the 2015 Grader due for replacement in 2041 at an estimated 2022 cost of $362,984. The next Shared Equipment up for replacement is the 2015 trailer due for replacement in 2028 at an estimated value of $13,439.

Table 2-26

Vehicles and Equipment – Condition State

UL%	Condition State	Replacement Value
140% ≤ UL%	Poor	$0
90% ≤ UL% < 140%	Fair	$0
45% ≤ UL% < 90%	Good	$55,983
UL% < 45%	Very Good	$834,947

Figure 2-18



2.7.3 Current Levels of Service

Levels of Service Category	Service Attribute	Current Levels of Service
Community Levels of Service	Scope	Vehicles and equipment are utilized to maintain our road network to ensure they are passable by passenger vehicles, emergency vehicles, pedestrians, cyclists, farm equipment and heavy transport vehicles.
	Quality	Vehicles and equipment in a poor, or worse, condition state could cause the municipality to meet its minimum maintenance standards.
Technical Levels of Service	Scope	Table 2-25 depicts the Municipality's vehicle and equipment.
	Quality	Table 2-25 summarized the average condition of the Municipality's vehicles and equipment.

2.7.4 Proposed Levels of Service

The Municipality has a Shared Services Agreement with the Township of Chamberlain and strive to manage their vehicle and equipment networks to share equipment where it makes sense and to manage their own equipment where it makes sense. A joint Public Works Committee makes recommendation to Council on any additions to the base set of equipment. The Municipalities have outlined the goal of maintaining the following equipment at a minimum:

Unshared Equipment:

- One Pickup Truck
- One Plow Truck
- One Grader
- One Backhoe

Shared Equipment:

- One Plow Truck
- One Pickup Truck
- One Brush Mower
- Two Trailers
- One Excavator

The Municipalities intend to replace vehicles near their expected useful life. This means that is reasonable to expect that only a relatively small number of vehicles will have a Useful Life percentage greater than 100%.

2.8 Streetlights

2.8.1 State of Local Infrastructure

The Municipality currently owns and manages 71 streetlights—each consisting of a head and an arm—with a 2022 replacement value totaling approximately $71,000. The replacement value has been based on current replacements costs. Table 2-27 provides a summary of quantity, expected useful life, age, and replacement value of the current streetlights network, by type. The average age of streetlights in the Municipality are 21 years. The lights are located within the Town of Charlton on both the streets and in Blackbridge Park and in the Bradley and Clarksville Subdivisions.

Table 2-27

Street Light Infrastructure Summary

Streetlight Type	Bulb Type	# of Lights	Age (Weighted Average)	Maximum Age	UL%	Average Condition State	Replacement Cost
Standard	Incandescent	43	32	33	127%	Fair	$ 43,000.00
	LED	14	3	5	10%	Very Good	$ 14,000.00
Decorative	Incandescent	14	14	14	56%	Good	$ 14,000.00
	LED	0	0	2022	0%		$ -
TOTAL		**71**		**33**			**$ 71,000.00**

2.8.2 Condition

The Municipality has used a four point scale as listed below to rate the condition of the streetlights. Streetlights have been given a useful life of 25 years with anything over 140% listed as poor. The Municipality currently only has the age of its streetlights to inform condition.

Table 2-28

Streetlights – Condition State

UL%	Condition State	Replacement Value
140% ≤ UL%	Poor	$0
90% ≤ UL% < 140%	Fair	$43,000
45% ≤ UL% < 90%	Good	$14,000
UL% < 45%	Very Good	$14,000

2.8.3 Current Levels of Service

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Levels of Service Category	Service Attribute	Current Levels of Service
Community Levels of Service	Scope	Streetlights are used to ensure the safety of passenger vehicles, emergency vehicles, pedestrians, cyclists on municipal roads.
	Quality	Streetlights in a poor, or worse, condition state could cause visibility issues for pedestrians or vehicles.
Technical Levels of Service	Scope	The section above outlines the municipal streetlights.
	Quality	The section above outlines the municipal streetlight conditions.

2.8.4 Proposed Levels of Service

The municipality proposes to continue at its current service level as our budget allows. The streetlight network is expected to be maintained but not expanded. As the decorative lights fail in Blackbridge Park the municipality will investigate either replacing or removing the lights based on budget and funding available at the time. The municipality is currently replacing lights at a rate of about five per year as they fail and moving from incandescent to LED. This effectively reduces hydro costs as well as reduces long term maintenance costs. With 57 Incandescent lights the municipality will need to continue this program for the next twelve years.

2.9 Signs

2.9.1 State of Local Infrastructure

The Municipality currently owns and manages 279 signs with a 2022 replacement value totaling approximately $41,850. The replacement value has been estimated based on the replacement costs by researching on Owl Signs Website. The signs have an average age of 21 years and a replacement cost of $139,500.

Table 2-29

Signs – Average Age and Replacement Costs

Sign Type	Quantity	Average Condition	Minimum Condition	Average Condition State	% Reflective	Replacement Cost
Children at Play	6	1.83	1.00	Poor	50%	$ 900.00
Danger	3	2.00	1.00	Fair	67%	$ 450.00
General Information	28	2.64	1.00	Fair	21%	$ 4,200.00
Horse and Buggy	4	3.00	3.00	Good	100%	$ 600.00
Intersection	20	2.41	1.00	Fair	80%	$ 3,000.00
Municipality Welcome	9	3.00	3.00	Good	56%	$ 1,350.00
No Exit	17	2.81	1.00	Fair	94%	$ 2,550.00
No Snowmobiling	3	3.00	3.00	Good	100%	$ 450.00
No Trespassing	1	3.00	3.00	Good	0%	$ 150.00
Railroad Crossing	2	2.00	2.00	Fair	100%	$ 300.00
Recreation and Cultural Interest	13	2.10	1.00	Fair	0%	$ 1,950.00
Route Marker	2	2.50	2.00	Fair	0%	$ 300.00
School Bus Stop Ahead	3	1.00	1.00	Poor	33%	$ 450.00
Seasonal Road	5	3.00	3.00	Good	100%	$ 750.00
Speed Regulation	20	3.00	1.00	Good	90%	$ 3,000.00
Stop	36	3.08	2.00	Good	97%	$ 5,400.00
Street Sign	99	3.00	3.00	Good	98%	$ 14,850.00
Turn and Curve	5	1.25	1.00	Poor	20%	$ 750.00
Yield	3	2.67	2.00	Fair	100%	$ 450.00
TOTAL	**279**	**1**		**Poor**	**85%**	**$ 41,850.00**

2.9.2 Condition

While asset age may provide some limited context to the functional state of an asset, an assessed physical condition is a better measure of where an asset is in its lifecycle. Physical condition therefore provides a more accurate estimate of an asset's remaining service life. The Public Works Department assessed our Sign Network in 2016. As replacements are made and when projects are undertaken on that section of road a physical condition rating is provided on a scale of 0-4, with 4 being a perfect condition and 0 indicating an asset at the end of its service life. To better communicate the condition of the sign network, these numeric condition ratings have been segmented into qualitative condition states. The table below summarizes the various physical condition ratings and the condition state they represent for sign assets.

Table 2-30

Signs-Condition Rating

Physical Condition	Condition State	Quantity	Replacement Value
1	Poor	23	$3,450
2	Fair	27	$4,050
3	Good	211	$31,650
4	Very Good	16	$2,400

2.9.3 Current Levels of Service

The Municipality currently has 23 signs in the poor condition and 27 signs in the fair condition for a total of $7,500. These signs vary across the municipality and have been grouped into sign types for simplicity. The municipality has a achieved an overall 85% reflectivity rate with a low of 0% to a high of 100%.

2.9.4 Proposed Levels of Service

The municipality has an ultimate goal of moving signs to be fully reflective to improve visibility and safety. The municipality will work on first upgrading poor non reflective signs and progressively moving up the condition state to achieve 100% reflectivity.

2.10 Waterlines

2.10.1 State of Local Infrastructure

The Municipality currently owns and manages a water treatment and distribution system comprised of one facility and 11,370 metres of mains. The 2022 replacement cost of the system is approximately $6,727,704. This system is split across two water systems – one in the Town of Charlton and one covering the Bradley and Clarksville Subdivisions.

Table 2-31

Watermain-Average Age and Replacement Cost

Watermain Location	Size (mm)	Length (m)	Age (Weighted Average)	Maximum UL%	Useful Life % (Weighted Average)	Average Condition State	Replacement Cost
Charlton	38	-	0	3370%	0%		$ -
	50	-	0	3370%	0%		$ -
	150	8,629.50	34	57%	57%	Good	$ 5,105,988.84
Bradley	38	447.22	34	57%	57%	Good	$ 264,615.60
	50	373.02	34	57%	57%	Good	$ 220,712.21
	150	1,920.58	4	7%	7%	Very Good	$ 1,136,387.97
TOTAL		**11,370.32**		**57%**	**0%**		**$ 6,727,704.62**

Figure 2-19

Charlton Water Distribution Map

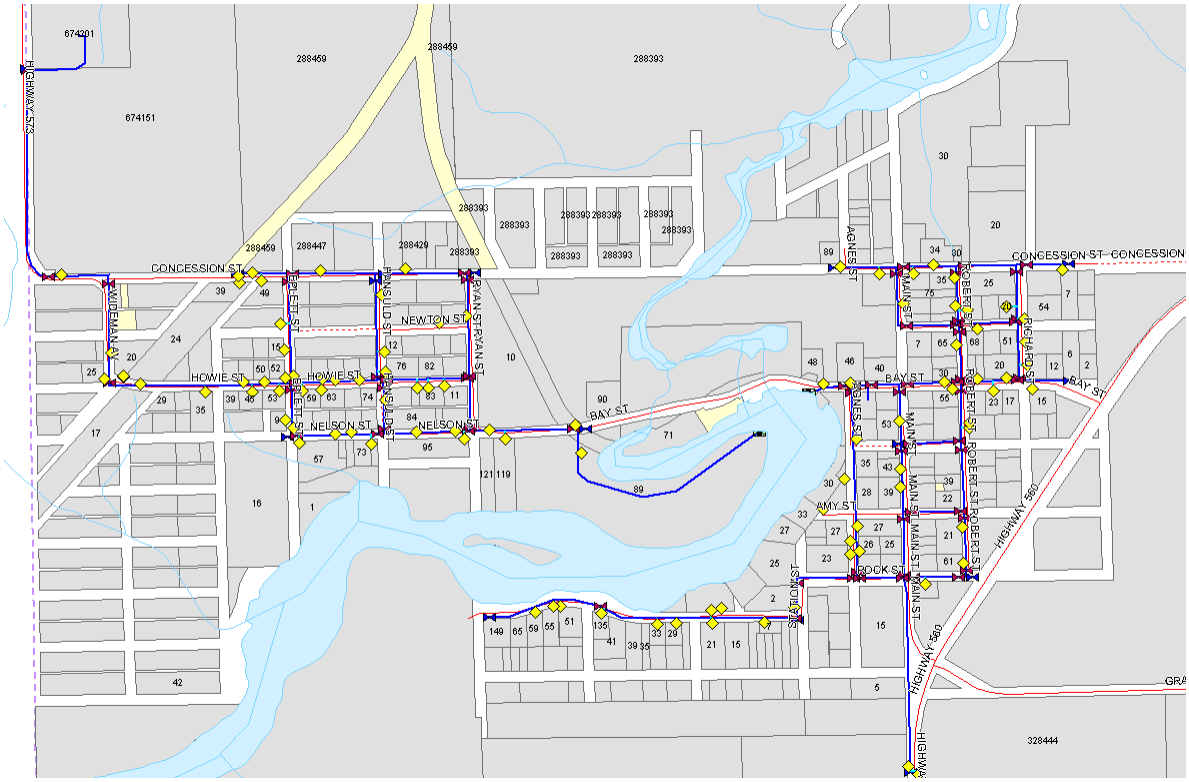
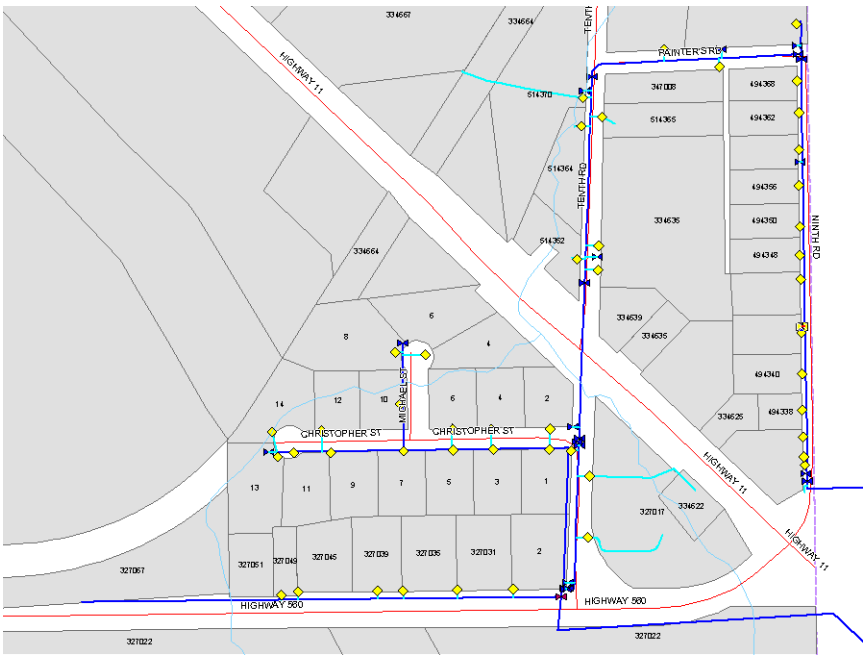


Figure 2-20

Bradley Water Distribution Map



2.10.2 Condition

The condition of the Municipality's water infrastructure has not been formally evaluated through an expert condition assessment. For the purposes of this asset management plan, asset age has been used as a proxy for the condition state of the Municipality's water infrastructure. The measure of percentage of useful life consumed was based on each assets age and the average life expectancy for the asset based on ideal best practices and discussion with Municipal staff. If an asset exceeds 100% it may still be in use but is expected to require replacement or rehabilitation in the near term.

Table 2-32

Waterlines – Condition Index

UL%	Condition State	Replacement Value
140% ≤ UL%	Poor	$0
90% ≤ UL% < 140%	Fair	$0
45% ≤ UL% < 90%	Good	$5,591,317
UL% < 45%	Very Good	$1,136,388

2.10.3 Current and Proposed Levels of Service

When assessing the current system the municipality focuses on minimizing the number of boil water advisories, moving the system to at least 150 mm to provide opportunity to connect fire hydrants, and infilling current lines to reduce individual costs. The municipality has been very successful in achieving

150 mm lines to residents which would provide the ability to have fire protection. Unfortunately, the number of properties where hydrants are available is low and only available in the Bradley Distribution System which is connected to the Town of Englehart. Council commissioned a study which outlined what would be required to bring fire protection to the Town of Charlton. This involved larger pumps and a water tower.

Service Attribute	Performance Measure	Current Performance	Proposed Levels of Service
Scope	Percentage of properties connected to the municipal water system	44%	Increasing
	Percentage of properties where fire flow is available.	93%	Increasing
	Percentage of properties where hydrants are available.	12%	Increasing
Reliability	The number of days per year where a boil water advisory notice is in place compared to the total number of properties and connected to the system	0	0
	The number of connection-days per year due to water main breaks compared to the total number of properties connected to the municipal water system.	0	Minimize
	Replacement cost of water assets with an age based condition of Poor or Fair.	0	Minimize

3 Lifecycle Management Strategy

3.1 Introduction

This chapter details the lifecycle management strategies required to maintain the current and proposed levels of service presented in Chapter 2. A lifecycle management strategy identifies the recommended lifecycle activities required to achieve the levels of service discussed in the previous chapter. Lifecycle activities are the specified actions that can be performed on assets in order to increase service level and extend service life. These actions can be carried out on a planned schedule in a prescriptive manner, or through a reactionary approach where the treatments are only carried out when specified conditions are met. O. Reg. 588/17 requires that all potential lifecycle activity options be presented, with the aim of analyzing these options in search of identifying the set of lifecycle activities that can be undertaken at the lowest cost to maintain current levels of service or to provide proposed levels of service. Asset management plans must include a 10-year capital plan that forecasts the lifecycle activities resulting from the lifecycle management strategy. What follows are the lifecycle management strategies for all asset classes contained within this asset management plan, with each section focusing on an individual asset category. Although a considerable amount of effort has been spent on developing lifecycle management strategies informed by observed asset conditions, there are still some assets for which the lifecycle management strategy is age-based. The lifecycle management strategy for these age-based assets is presented in the last section of this chapter. The expenditure forecasts resulting from the lifecycle management strategies for each asset category are also included in the following sections, and have been developed for a 20-year forecast period.

3.2 Roads

3.2.1 Lifecycle Activities

This section will detail the lifecycle activities as documented through discussions with Municipal staff. The lifecycle activities that the Municipality currently employs in the management of its roads include:

- Gravel Roads
    - Maintenance – Minor Regravelling
    - Gravel Top Up (75 mm)
    - Gravel Resurfacing (150mm, Brushing, Light Ditching)
    - Gravel Rehabilitation (150mm A, 300mm B, Excavation, Brushing, Ditching)
    - Gravel Reconstruction (150mm A, 300mm B, Excavation, Brushing, Ditching, Culverts)
- Surface Treated Roads
    - Maintenance – Cold Mix Pothole Patching
    - Surface Treatment Resurfacing (Pulverize Existing, Single Treatment)
    - Surface Treatment Rehabilitation (Excavation, 50mm, Double Treatment, Ditching)
    - Surface Treatment Reconstruction (Excavation, 50mm, Double Treatment, Ditching, Brushing)

Table 3-1 details the costs associated with undertaking these lifecycle activities by surface type. The costs are presented on a $/m basis. These costs are based on unit costs derived from recent contract tenders and discussion with municipal staff.

Table 3-1

Road Treatment Costs by Surface Type

Lifestyle Activity	Cost / m
Gravel Top Up (75 mm)	$ 15.02
Gravel Resurfacing (150mm, Brushing, Light Ditching)	$ 38.74
Gravel Rehabilitation (150mm A, 300mm B, Excavation, Brushing, Ditching)	$ 273.11
Gravel Reconstruction (150mm A, 300mm B, Excavation, Brushing, Ditching, Culverts)	$ 293.11
Surface Treatment Resurfacing (Pulverize Existing, Single Treatment)	$ 178.55
Surface Treatment Rehabilitation (Excavation, 50mm, Double Treatment, Ditching)	$ 219.15
Surface Treatment Reconstruction (Excavation, 50mm, Double Treatment, Ditching, Brushing)	$ 535.30

3.2.2 Degradation Profiles

Assets deteriorate over time, eventually reaching a point where they have no remaining service life left. However, the path each asset takes in reaching its end of life differs, even for assets of the same type. A condition rating identifies where along the path any particular asset lays, or in other words, how long an asset has left before it reaches its end of life. The municipality works to keep its road network above a condition rating of Good through the use of Top Ups and Resurfacing. If the road network falls into the fair or poor category additional expenses need to be done to reconstruct or rehabilitate the road. There is a limit to rehabilitation which will need to be done approximately every 40 years but with adequate upkeep the municipality believes reconstruction of the asset could be avoided.

3.2.3 Expected Lifecycle

Combining the treatments and degradation profiles, results in a complete lifecycle management strategy. For surface treated roads it is important to complete the final application to extend the life of the road to its maximum life and reduces long term costs. The difference between Class 4 and the other road types reflect the increased traffic that occurs on these roads.

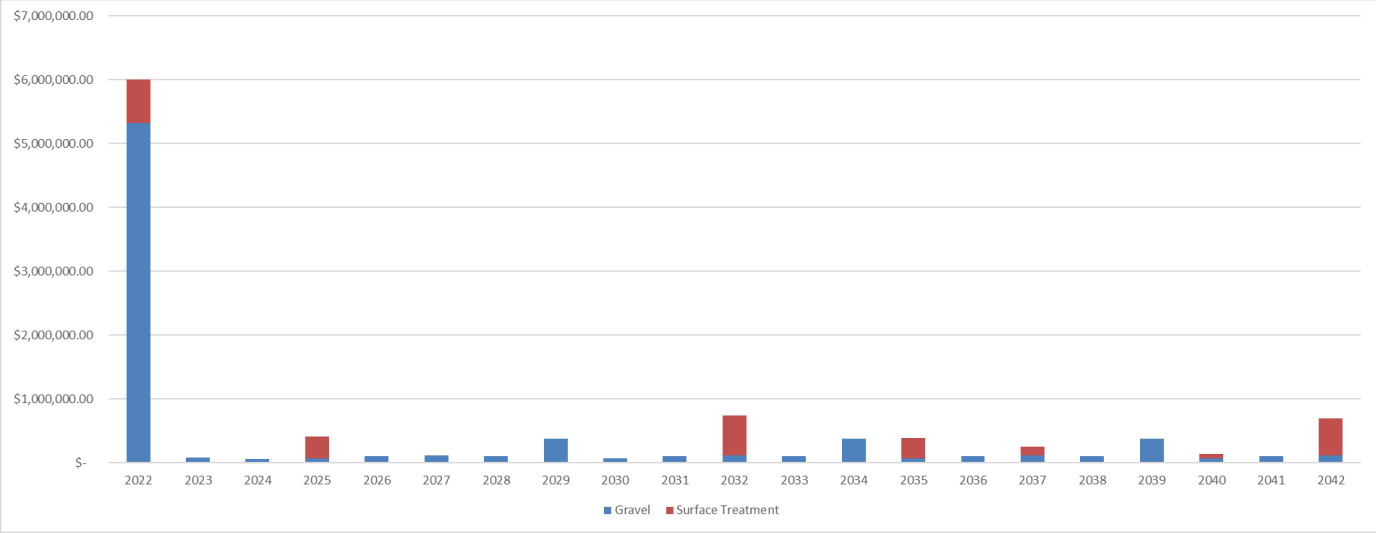
Surface Type	Year	Lifecycle Activity
Class 4 Gravel Roads	5	Top Up
Class 5, 6, Seasonal Gravel Roads	7	Top Up
Class 4 Surface Treated Roads	3	2nd application is applied
Class 4 Surface Treated Roads	10	Resurfacing
Class 5, 6, Seasonal Surface Treated Roads	3	2nd application is applied
Class 5, 6, Seasonal Surface Treated Roads	10	Resurfacing

3.2.4 Capital Costs / Forecast

Figure 3-1 presents the 20-year expenditure forecast that results from following the lifecycle management strategy detailed above. This forecast illustrates the annual expenditures without any consideration to budgetary constraints. Over the 20-year forecast period, the average annual expenditures would be approximately $512,645, in 2022 dollars. It is noted that the large expenditure amount shown in year one of the forecast represents the cost of bringing all road segments to their minimum levels of service thresholds.

Figure 3-1

Lifestyle Cycle for Roads



3.3 Bridges and Structural Culverts

3.3.1 Lifecycle Activities

This section will detail the lifecycle activities (capital treatments) as set forth in the 2020 OSIM report and through discussions with Municipality staff. The treatments that the Municipality currently employs in the management of its bridges and culverts include:

- Minor Rehabilitation
- Major rehabilitation
- Reconstruction

Table 3-2 details the costs for the lifecycle activities listed above. These costs are presented as a percentage of estimated replacement cost for the entire bridge, which are derived from averages present in the 2020 OSIM report.

Table 3-2

Bridge and Culvert Treatment Costs as Percent of Total Replacement

Structure Type	Structure Name	BCI	Last Year	Category	Average Lifespan	Remaining Life	Estimated Current Year Costs	Required Rehabilitation in next 10 years per OSIM	Rehabilitation Cost as a % of Replacement Cost
Bridge	River Road Bridge	68.93	1977	Fair	75	30	$ 7,482,538.94	$1,250,000.00	17%
Culvert	Brentha Road Culvert East	60.1	1982	Poor	50	10	$ 1,046,200.59	$ 170,000.00	16%
Culvert	Brentha Road Culvert West	40	1983	Poor	50	11	$ 1,591,310.02	$ 150,000.00	9%
Culvert	Storybook Road Culvert	33.7	1982	Poor	50	10	$ 1,040,402.22	$ 150,000.00	14%

3.3.2 Degradation Profiles

Assets deteriorate over time, eventually reaching a point where they have no remaining service life left. However, the path each asset takes in reaching its end of life differs, even for assets of the same type. A condition rating identifies where along the path any particular asset lays, or in other words, how long an asset has left before it reaches its end of life. These bridges and culverts are regularly assessed by professional engineers and their degradation profiles can be more accurately tracked.

3.3.3 Decision Criteria

Figure 3-2 presents the decision criteria—developed through discussions with Municipal staff—for triggering specific bridge and culvert treatments. When all of the decision criteria for a given asset are met, the corresponding treatment is eligible to be applied. When a treatment is applied, the BCI of the asset is improved by the amount specified in the “Gain to Condition” column, but not to exceed 100.

Figure 3-2

Bridge and Culvert Treatment Decision Criteria

Physical Condition – Beginning	Physical Condition – Ending	Condition State	Condition Description	Lifecycle Activity	Gain to Condition
0	60	Poor	Widespread signs of deterioration, some assets may be unusable. Service is affected.	Reconstruction	100
61	75	Fair	Some elements exhibit significant deficiencies, Asset requires attention.	Major Rehabilitation	25
75	90	Good	Good condition, few elements exhibit existing deficiencies.	Minor Rehabilitation	15
90	100	Very Good	Well maintained, good condition, new or recently rehabilitated.	Maintenance	0

3.3.4 Expected Life

Combining the treatments, degradation profiles, and decision criteria presented herein results in a complete lifecycle management strategy. The lifecycle strategy as defined for bridges is a preservation strategy, which means that an asset will only receive rehabilitation treatments and not be reconstructed, assuming that the window of opportunity to conduct the rehabilitation treatments has not passed. In other words, as long as budgetary constraints never prevent a bridge rehabilitation from occurring as it becomes due, a bridge will never degrade to a point that it needs to be reconstructed. For example, a representative bridge will degrade from some BCI greater than 75, and upon reaching a BCI of 75, the bridge will be triggered for a rehabilitation, which in turn increases its BCI to 100. This process will loop ad infinitum until such a time as budgetary pressures prevent the rehabilitation from occurring. If the fiscal limits prevent the bridge from being treated for some time period that the bridge's BCI falls to 60 or below, only then will a reconstruction be triggered. Unfortunately, two of our culverts have already crossed the reconstruction threshold.

The lifecycle strategy for culverts is to reconstruct (replace) when the designated BCI is reached. While this strategy is simple—and may not appear to be significantly different from an age-based replacement strategy—because it is informed by the assessed condition this strategy results in more accurate forecasting. As the asset's condition is regularly re-assessed over time, the timing of the eventual reconstruction could vary significantly from an age-based approach. For example, if the environment that the culvert resides in causes it to degrade quicker or slower than the expected average, and the

assessed condition rating reflects this, then the eventual replacement will be triggered at a different time than an age-based approach.

Figure 3-10

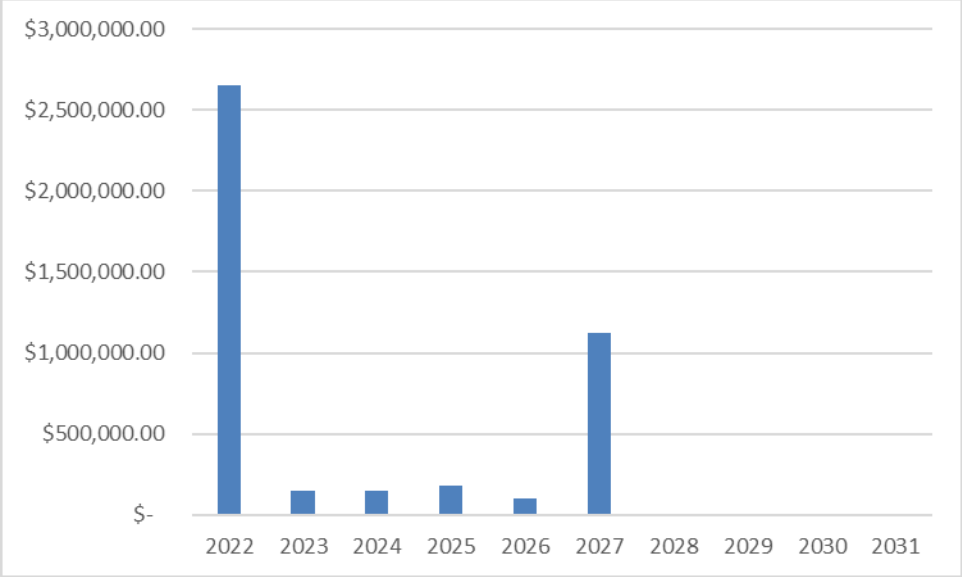
Lifecycle Strategy – Culverts

3.3.5 Capital Costs / Forecast

This is the forecast without any budgetary constraints. It includes the complete reconstruction of two of the structural culverts and the major rehabilitation of the bridge per the OSIM report. This creates an average annual investment of $435,171 over the next 10 years.

Figure 3-3

Bridge & Culvert Lifecycle Management Strategy – Funding Requirements



3.4 Facilities

3.4.1 Lifecycle Activities

This section will detail the capital treatments as developed through discussions with Municipal staff. The treatments that the Municipality currently employs in the management of its facilities consists of the replacement of the high-level facility components. This strategy, as it applies to buildings, is intended to replace the common high-level components of a building that deteriorate over time. It is assumed that by replacing these components over time, and through continual maintenance activities of the buildings as a whole, the overall condition of a building will remain in good health. This implies that the core structural and sub-structural components of a building will not degrade appreciably. Therefore, the entire reconstruction of a building has not been modeled within this plan. If circumstances arise that a reconstruction were deemed necessary, then the outputs of this strategy would need to be modified in light of these changes. As some examples, a building's capacity could be deemed to be insufficient for current Municipality needs or some event could harm the structural or sub-structural elements of a building, both of which could necessitate the reconstruction of a building. In such cases, the existing capital plans for these buildings would need to be readdressed through an update to this asset management plan.

3.4.2 Degradation Profile

Assets deteriorate over time, eventually reaching a point where they have no remaining service life left. The municipality, in discussions with staff, have determined that most assets are either maintained or in need of replacement. There is limited opportunities to extend the life but many assets due exceed their average lifespan.

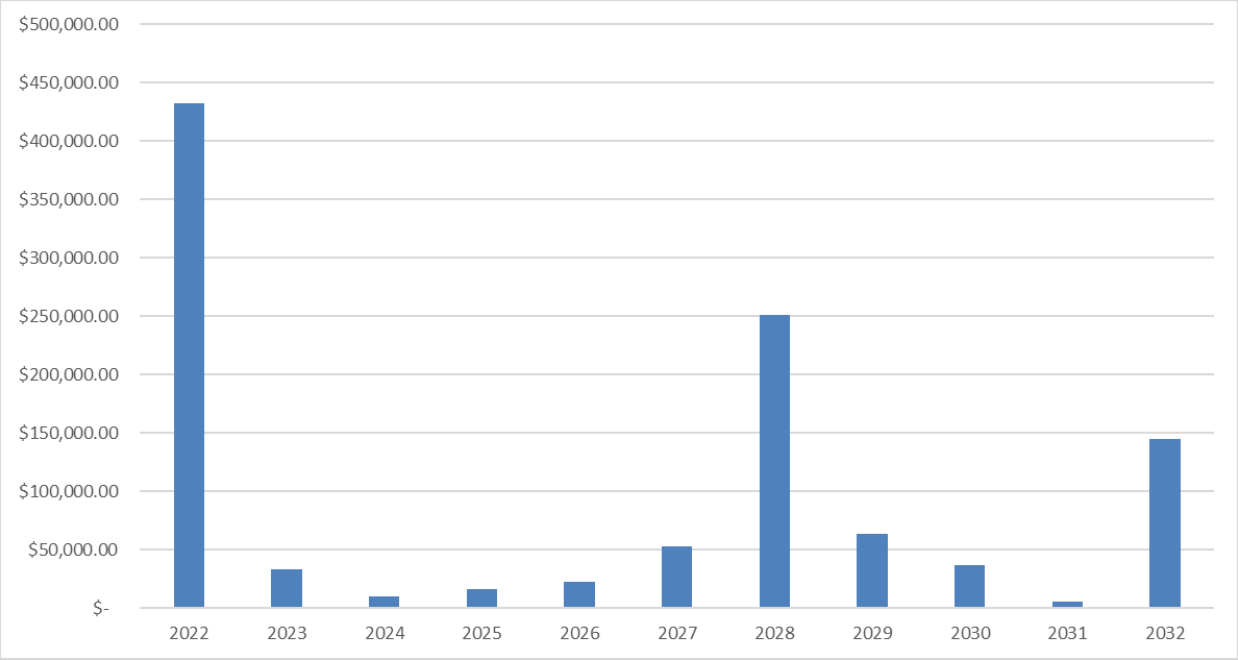
UL%	Condition State	Condition Definition	Lifecycle
140% ≤ UL%	Poor	Widespread signs of deterioration, some assets may be unusable. Service is affected.	Replacement
90% ≤ UL% < 140%	Fair	Some elements exhibit significant deficiencies, Asset requires attention.	Replacement
45% ≤ UL% < 90%	Good	Good condition, few elements exhibit existing deficiencies.	Maintenance
UL% < 45%	Very Good	Well maintained, good condition, new or recently rehabilitated.	Maintenance

3.4.3 Expected Lifecycle

The municipality is expecting that there is a backlog which creates a large current year estimate. Once this amount is completed the average annual investment is expected to even out.

Figure 3-4

Culvert Replacement Activity



3.4.4 Capital Costs/Forecasts

The Municipality is expecting that the average annual 10 year investment would be $97,304 for a total 10 year investment of $597,203. This would address items in the poor and fair categories across the facilities.

3.5 Entrance and Road Culverts

3.5.1 Lifecycle Activities

This section will detail the capital treatments as developed through discussions with Municipal staff. The staff try to inspect culverts regularly and replace as needed. Culverts are not rehabilitated and are replaced when the asset reaches the end of life.

3.5.2 Degradation Profile

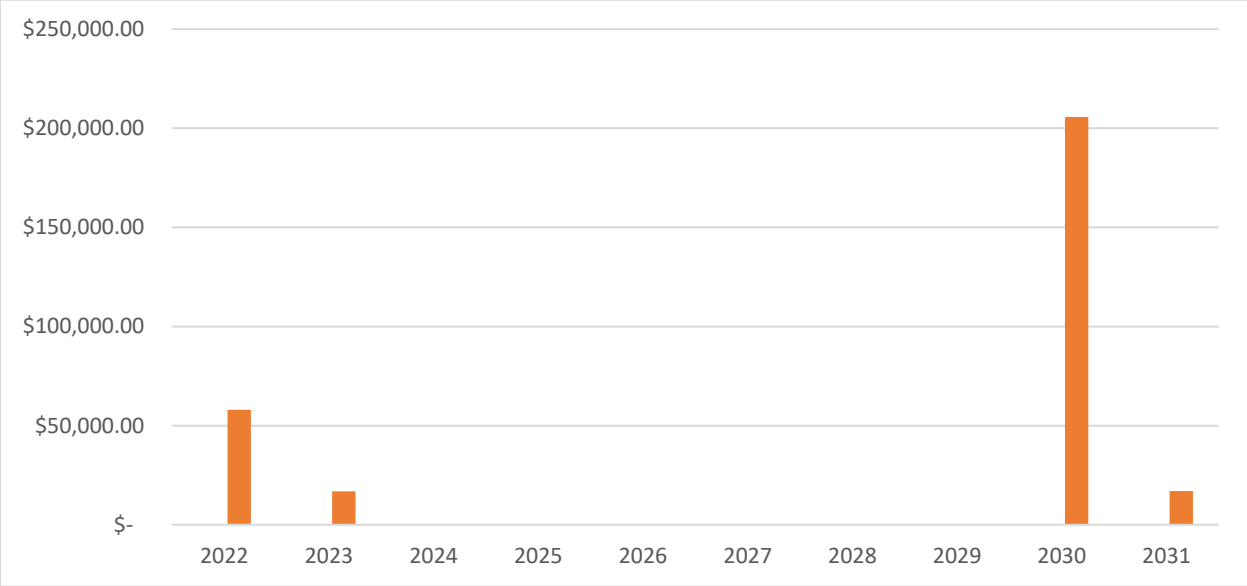
Assets deteriorate over time, eventually reaching a point where they have no remaining service life left. The municipality, in discussions with staff, have determined that most assets are either maintained or in need of replacement. When culverts reach either the poor or fair state they are flagged as needing to be replaced and based on budget and time constraints are completed. Generally, culverts are expected to have a life of 30 years.

3.5.3 Expected Lifecycle

The Municipality continues to invest in its culvert network and as shown below is expecting an uneven replacement cycle which peaks in 2030 with a large investment.

Figure 3-5

Culvert Network Replacement



3.5.4 Capital Costs/Forecasts

The Municipality is expecting that the average annual 10 year investment would be $14,875.83 for a total 10 year investment of $297,000. This would address items in the poor and fair categories across the culverts.

3.6 Signs

3.6.1 Lifecycle Activities

This section will detail the capital treatments as developed through discussions with Municipality staff. The staff try to inspect signs for condition and reflectivity. The plan is to replace culverts to improve reflectivity and ensure the quality of the sign is readable to the public. There is not rehabilitation expected for signs just replacement.

3.6.2 Degradation Profile

Assets deteriorate over time, eventually reaching a point where they have no remaining service life left. The municipality, in discussions with staff, have determined that most assets are replaced. Signs require very little maintenance but after outdoor elements are replaced over time.

3.6.3 Expected Lifecycle

The Municipality expects the signs would have a life of 25 years and would be replaced only if conditions require it. Signs may be replaced early for reflectivity if budget allows for it.

3.6.4 Capital Costs/Forecasts

The Municipality expects that an average annual investment of $750 would be required over the next 10 years for a total of $7,500 over the ten years to address the Poor and Fair signs.

3.7 Age Based Assets

The remainder of the Municipality's assets do not presently have an assessed condition, and as such will all be subject to the same age-based lifecycle management strategy. The following subsections will apply to the following asset classes:

- Streetlights;
- Waterlines; and
- Vehicles and Equipment.

3.7.1 Lifecycle Activities

3.7.2 Degradation Profiles

For age based assets, a decreasing degradation profile simply details what percentage of service life is left in light of an expected useful life.

3.7.3 Decision Criteria

For age-based assets, when an asset reaches the end of its service life a replacement treatment is triggered, resulting in the reconstruction or acquisition of a new asset.

3.7.4 Expected Lifecycle

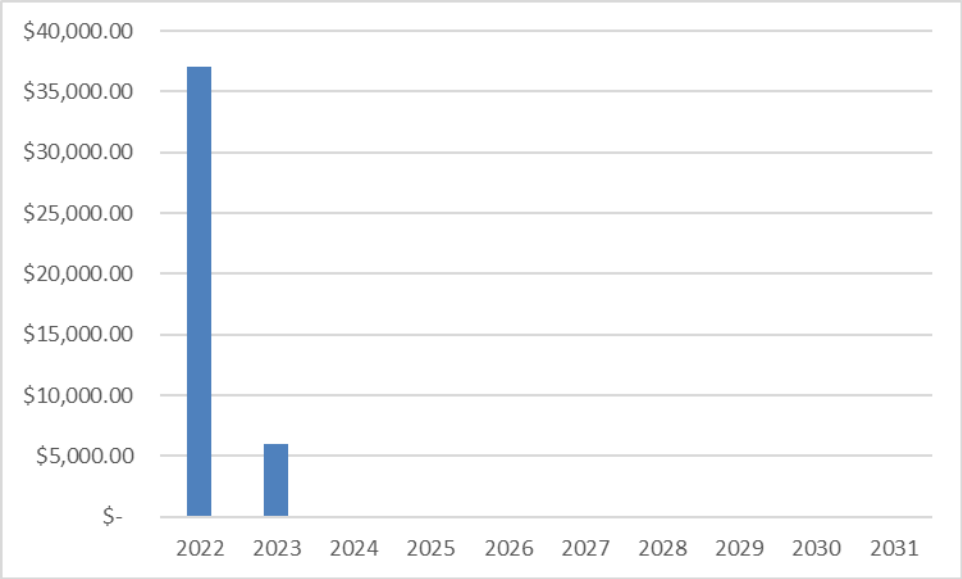
Combining the treatments, degradation profiles, and decision criteria presented herein results in a complete lifecycle management strategy.

3.7.5 Capital Costs / Forecasts

3.7.5.1 Streetlights

Figure 3-6 presents the 10-year expenditure forecast that results from following the lifecycle management strategy detailed above. This forecast illustrates the annual expenditures without any consideration to budgetary constraints. Over the 10-year forecast period, the average annual expenditures would be approximately $4300, in 2022 dollars.

Figure 3-6



3.7.5.2 Waterlines

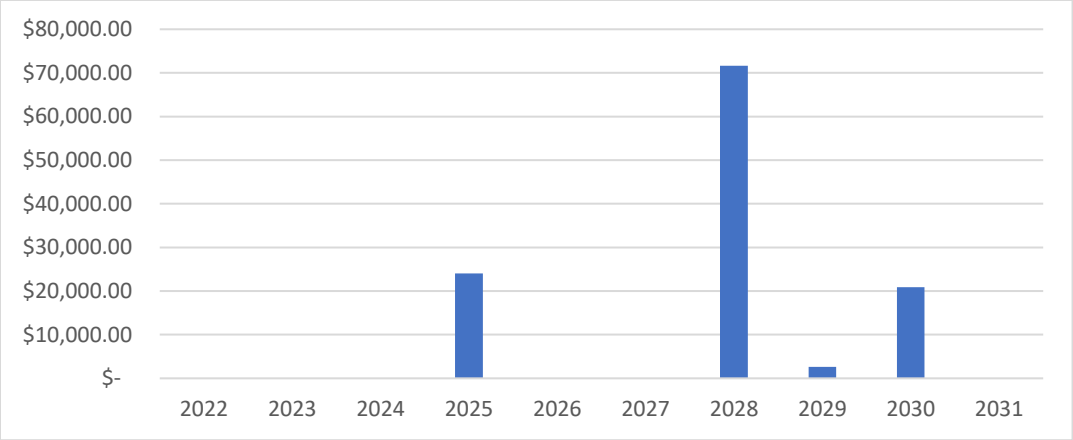
The waterlines were generally installed in two different yearly batches – in 1989 and in 2018. Therefore, many will likely come due all at the same time for replacement. The next big replacement is expected in 2048 which would require an average annual investment of $207,085 to save for the estimated $5,591,316 in 2022 dollars.

3.7.5.3 Vehicles and Equipment

The vehicles and equipment need an average annual investment of $39,725 to ensure we are replacing vehicles and equipment with like equipment at the end of the term. Most of the equipment was purchased used which could significantly impact expectations if adequate used equipment is not available.

Figure 3-7

Vehicles and Equipment over the Next 10 Years



3.8 Population

Based on the most recent census the municipality has a population of 686 an increase of 4.6% from 2011. Overall, the municipality is not expecting that population growth will have an impact on increasing servicing in the future. The greater risk is a shrinking population as has been happening in Northern Ontario and the increasing reliance this puts on the remaining taxpayers. The small population already makes the municipality reliant on Provincial and Federal funding to maintain its assets.

4 Financing Strategy

4.1 Introduction

This chapter details the financing strategy that would sustainably fund the lifecycle management strategies presented previously. This financing strategy focuses on examining how the Municipality can fund the lifecycle activities required to maintain its assets at the current and/or proposed levels of service. The strategy presented is a suggested approach which should be examined and re-evaluated during the annual budgeting processes to ensure the sustainability of the Municipality's financial position as it relates to its assets. O. Reg. 588/17 requires a 10-year capital plan that forecasts the costs of implementing the lifecycle management strategy and the lifecycle activities required therein. To help plan better longer term the municipality has reviewed a capital plan over the next 20 years. The financing strategy forecast (including both expenditure and revenue sources) was prepared consistent with the Municipality's departmental budget structure so that it can be used in conjunction with the annual budget process. Various financing options, including reserve funds, debt, and grants were considered and discussed during the process. The recommended financing strategy identifies rehabilitation and replacement activities required over the forecast period, as described in preceding sections of this plan.

4.2 Annual Costs

The table presents the capital expenditure forecast for each asset class over the 2022- 2041 forecast period. This expenditure forecast is based on the lifecycle activities identified in preceding sections of this plan. It is noted that in the early years of the forecast, certain assets may fall below their respective level of service targets, as the Municipality gradually increases available capital funding. The capital expenditures are in 2022 dollars and are not adjusted for inflation. The greatest immediate shortfall is in the road category where the municipality will not be able to meet its service levels. A small and shrinking population put the existing assets at risk. This plan focuses on only replacement of existing structures with no plans to expand.

Figure 4-1

Annual Capital Investment Required

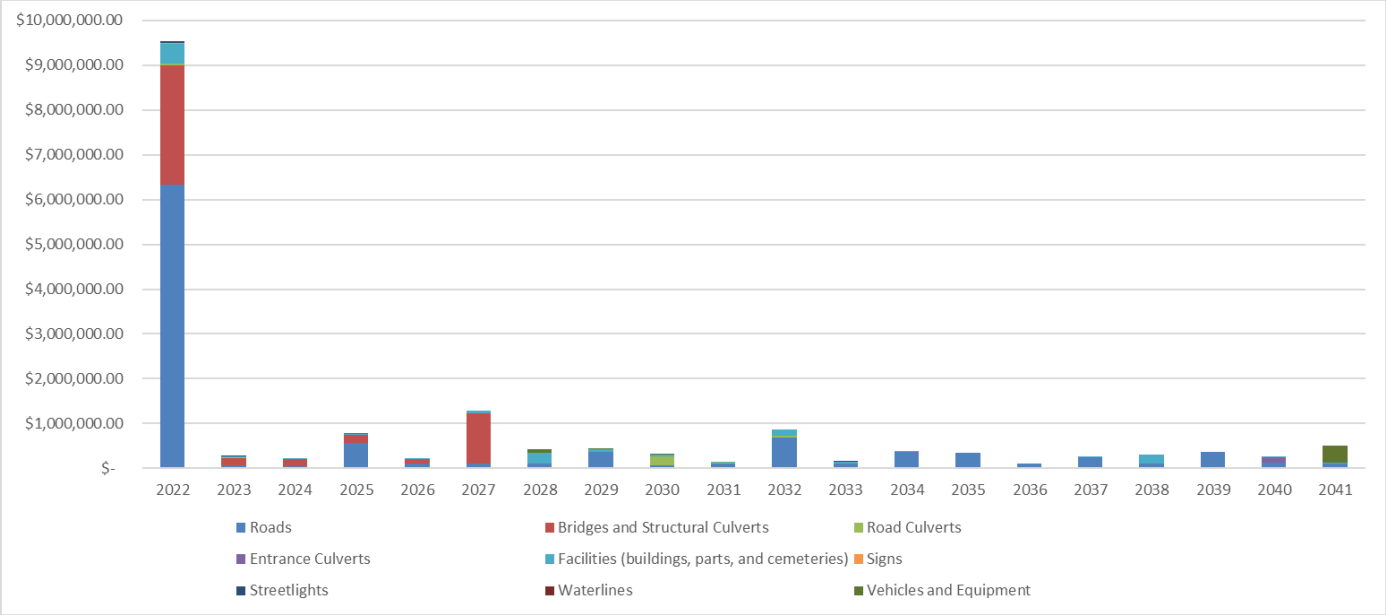


Table 4-1

2022 Capital Investment Needs

Expense	2022
Roads	$ 5,999,268.37
Bridges and Structural Culverts	$ 2,651,712.24
Road Culverts	$ 57,992.52
Entrance Culverts	$ -
Facilities (buildings, parts, and cemeteries)	$ 432,277.34
Signs	$ 7,500.00
Streetlights	$ 37,000.00
Waterlines	$ -
Vehicles and Equipment	$ -
Total	$ 9,185,750.47

To address the immediate capital needs of the municipality would require $9,185,750 in 2022 with roads and bridges containing the largest dollar amounts.

Figure 4-2

Average Annual Capital Investment Needed

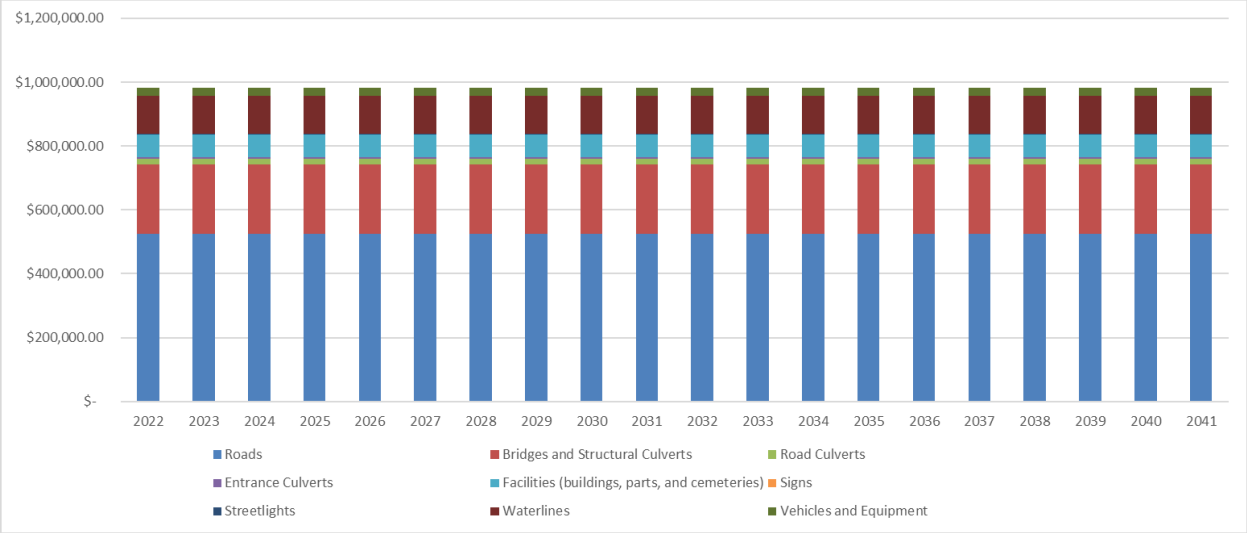


Table 4-2

Average Annual Capital Investment Needs

Expense	Annual
Roads	$ 503,567.56
Bridges and Structural Culverts	$ 217,585.61
Road Culverts	$ 17,451.58
Entrance Culverts	$ 5,342.51
Facilities (buildings, parts, and cemeteries)	$ 69,302.39
Signs	$ 375.00
Streetlights	$ 2,850.00
Vehicles and Equipment	$ 24,111.57
Total Tax Supported	**$ 840,586.22**
Waterlines	$ 119,181.63
Total	$ 959,767.85

To better address the long term needs of the municipality, an average annual investment of $840,586 is needed for tax supported items with $119,181 needed to support water infrastructure annually over the next 20 years.

4.3 Funding Shortfall

Reserves

The Reserve position at December 31, 2020 was $572,993, representing $2003 per household. The reserve position does include $25,935 which has been set aside for the Englehart and Area Fire Department (not included in this plan). It is difficult to determine what would be considered an adequate reserve level. Some reserves are restricted – such as for the cemetery which limits what can be used for capital programs.

	2020
Reserves and deficits	
Working capital reserve	$ 369,630
Modernization reserve	106,190
Cemetery reserve	32,204
Heritage Centre reserve	3,163
Clarksville water reserve	10,559
Bradley Subdivision water reserve (deficit)	2,795
Charlton water reserve	6,038
Fireworks reserve	3,845
Fire department reserve	25,935
Integrity commission investigation reserve	5,000
Covid-19 safe restart reserve	3,634
Parkland reserve	4,000
	572,993

Current Debt

At December 31, 2020 the Municipality had one loan totaling $86,170. This represents debt related to the replacement of the Clarksville Waterlines which matures in April 2033. This gives us an Annual Repayment Limit of $94,985 – which represents 25% of revenues less net debt charges. The actual ability to take out debt is likely to be many times lower than the Annual Repayment Limit allows.

Taxation and Water Rates

The Municipality currently has a levy of $680,719 which includes about $10,000 annually toward capital costs. The Municipality greatly depends on grants to fund its capital program. According to the Ministry of Municipal Affairs and Housing the average residential household pays $1765 which makes up 2.6% of a median household income. Approximately half of the residential households also pay a minimum annual water rate charge of $1,000. Increasing costs in other areas and a high water rate put a limit on what the Municipality is able to increase to fund capital costs. Further to this, many of our roads are used to service the unorganized Townships adjacent to the municipality and we do not have the ability to tax these properties.

Financial Strategy

This financing strategy is fully funded only through a tax increase of 101% and water increase of 66%. This large increase is due to the small nature of the municipality – 286 households. Unfortunately, the annual shortfall after grants, taxation and water rates is $797,767. This greatly exceeds the municipalities borrowing limit of $94,985 annually and our operating reserves. This tax rate increase also assumes that the Gas Tax and OCIF funding will continue at their current rates. The Municipality will balance this budget by missing service delivery levels while waiting for provincial or federal funding opportunities. Traditionally, large infrastructure projects have been funded through a combination of Federal and Provincial Funding with the municipality putting in 10%. At this rate the municipality would still need a significant tax increase of 12% to cover its 10% share over the longer term. The water rate would need to increase 7% if grants were provided at 90% of our capital costs. Looking at just the capital levy for tax supported assets the municipality is short $698,586 annually which would require a tax increase per household of $2,442 – which does not reflect inflation increases over the 20 year term.

Table 4-3

Capital Contributions for Tax Supported

Capital Contributions for Tax Supported:	
Amount to Finance	$ 840,586.22
Less Grants	$ 142,000.00
Total Capital Needed Annually	$ 698,586.22
Households	286
Fully Funded Capital per Household	$ 2,442.61