Asset Management Plan

Township of Chamberlain

May 2022

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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 Municipality 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.

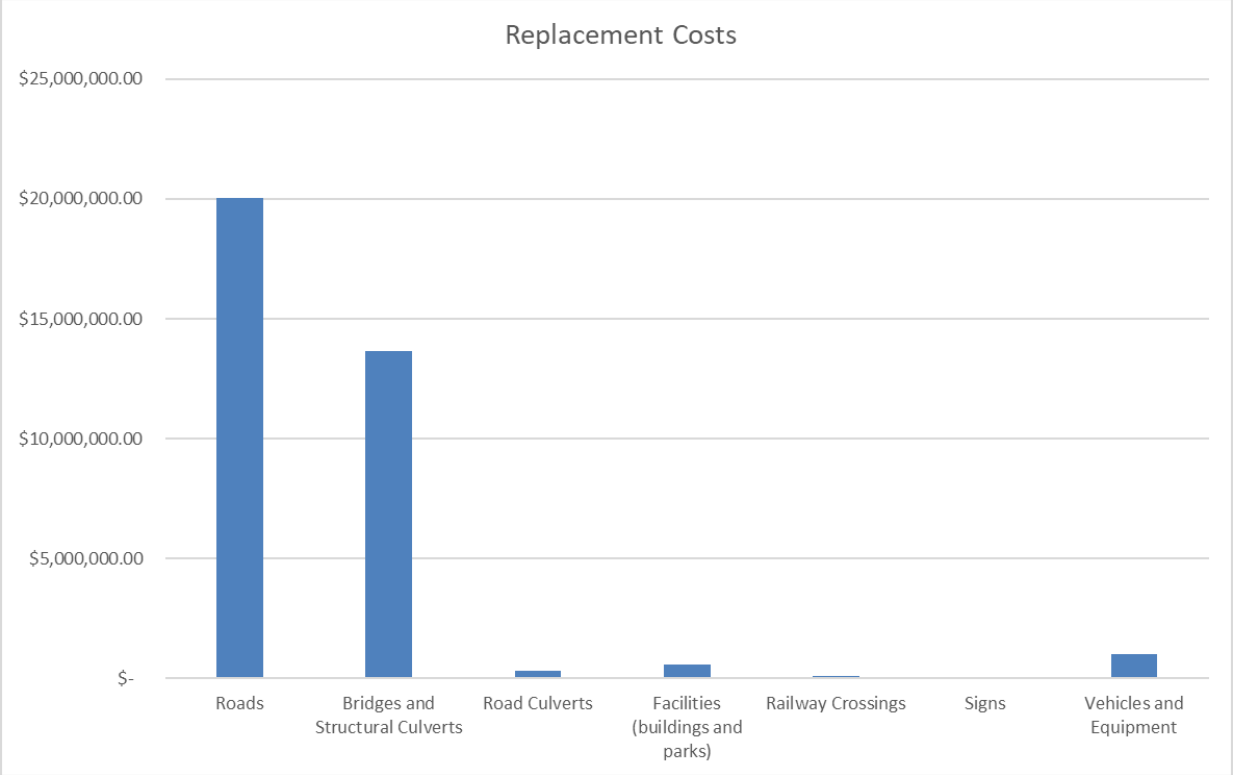
The following assets are included in this asset management plan:

Table 1-1

Asset Classes and Replacement Costs

Asset Class	Replacement Costs
Roads	$ 20,016,511.83
Bridges and Structural Culverts	$ 13,664,982.14
Road Culverts	$ 319,101.87
Facilities (buildings and parks)	$ 577,764.39
Railway Crossings	$ 119,000.00
Signs	$ 2,650.00
Vehicles and Equipment	$ 997,268.96
Total	**$ 35,697,279.20**

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.

Table 1-2

Asset Classes per Household

Asset Class	Replacement Costs	Households	Cost/Household
Roads	$ 20,016,511.83	165	$ 121,312.19
Bridges and Structural Culverts	$ 13,664,982.14	165	$ 82,818.07
Road Culverts	$ 319,101.87	165	$ 1,933.95
Facilities (buildings and parks)	$ 577,764.39	165	$ 3,501.60
Railway Crossings	$ 119,000.00	165	$ 721.21
Signs	$ 2,650.00	165	$ 16.06
Vehicles and Equipment	$ 997,268.96	165	$ 6,044.05
Total	**$ 35,697,279.20**	**165**	**$ 216,347.15**

1.2 Legislative Context for the Asset Management Plan

Asset management planning in Ontario is continuous 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.

The difficulty in assessing local infrastructure is that it may not be consistent between communities. In larger communities – even at a same class of road using the same Pavement Condition Index or Gravel Condition Index – the expectation is higher and may overstate the quality of rural road networks when compared to more urban areas.

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

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

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

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

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

2.2 Roads

2.2.1 State of Local Infrastructure

The Township currently owns and manages 74.10 centreline kilometres of road assets with a 2022 replacement value totaling approximately $20,016,511. 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 a single surface type – gravel and all roads reside in a rural environment. Table 2-1,

and **Error! Reference source not found.** provide a breakdown of the road network by surface type and roadside environment. The entirety of the road network, on average, is 16 years old.

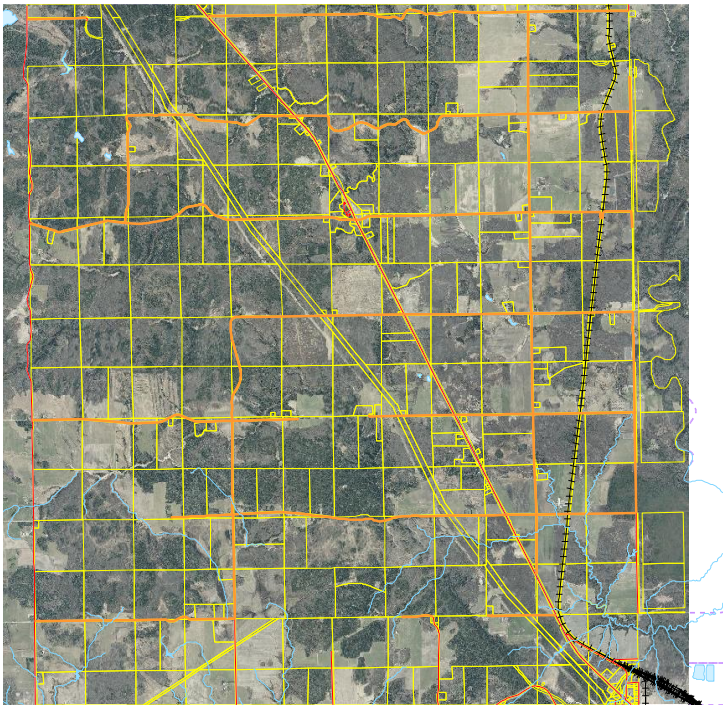
Table 2-1

Roads – Surface Type

Surface Type	Centreline Kilometres	Age (Weighted Average)	Replacement Costs
Gravel	74.10	16	$ 20,016,511.83
TOTAL	**74.10**	**16**	**$ 20,016,511.83**

Figure 2-1

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.	7.3
40	59	Fair	Some elements exhibit significant deficiencies, Asset requires attention.	31.6
60	79	Good	Good condition, few elements exhibit existing deficiencies.	21.6
80	100	Very Good	Well maintained, good condition, new or recently rehabilitated.	13.7

Table 2-3

Roads – Illustration of Condition State

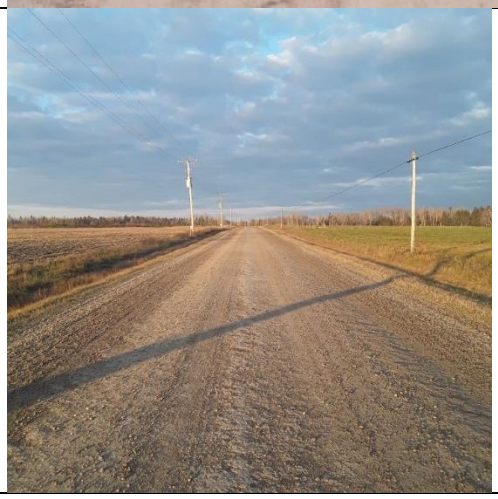
State	Gravel
Poor	
Very Good	

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.

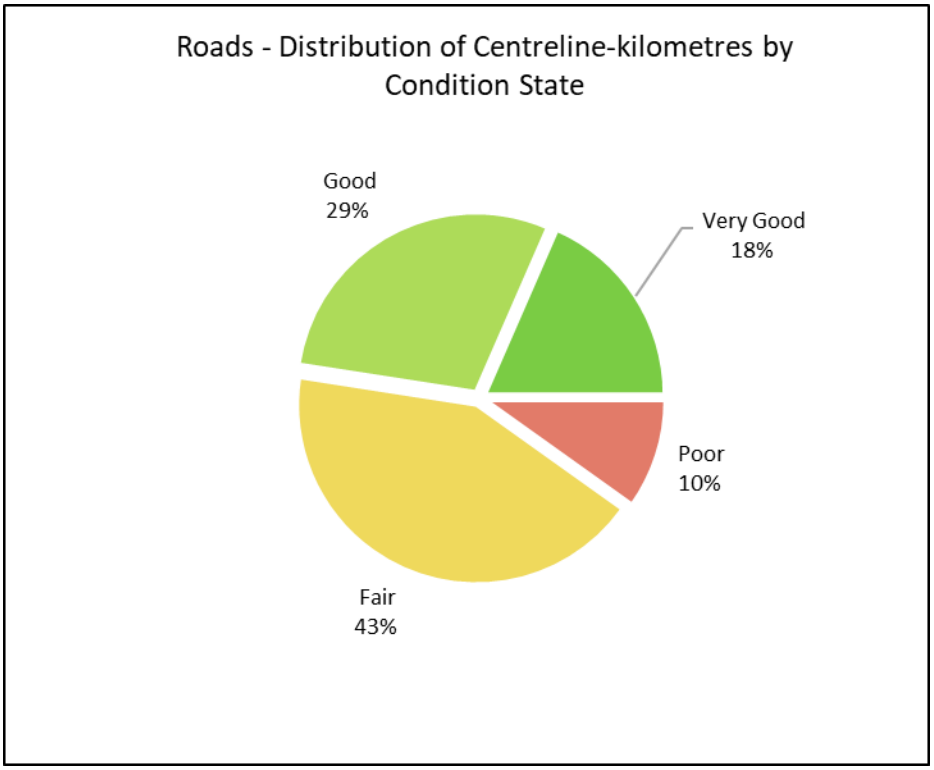
As illustrated in Table 2-4, our Class 4 roads are in a “Good” condition state and our seasonal roads are in a “Fair” State with a physical condition of 61.

Table 2-4

Road Condition Analysis

Surface Type	Centreline Kilometres	Physical Condition	Average Condition State
Gravel	74.10	60.64	Good
TOTAL	**74.10**	**60.64**	Good

Figure 2-2



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.	[redacted]
	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.	1.34
	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. N/A 2. 61 (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

The table details what proportion of the road network falls below the proposed technical levels of service objectives, by MMS road classification. The Class 4 gravel roads have 82% who do not meet the proposed level of service and 68% of the Class 6 fail to meet the proposed levels of service. Broken down further, thirty-one road sections currently do not meet their proposed standard including:

- AIDIE CREEK GARDEN ROAD S1
- AIDIE CREEK GARDEN ROAD S3
- ALPINE RD S1
- BEAVER ROAD S1
- BEAVER ROAD S2
- BEAVER ROAD S3
- CHAMBERLAIN ROAD 2 S2
- CHAMBERLAIN ROAD 2 S4
- CHAMBERLAIN ROAD 2 S6
- CHAMBERLAIN ROAD 4 S1
- CHAMBERLAIN ROAD 4 S2

- CHAMBERLAIN ROAD 5 S1
- CHAMBERLAIN ROAD 5 S2
- CHAMBERLAIN ROAD 5 S3
- CHAMBERLAIN ROAD 5 S4
- CHAMBERLAIN ROAD 6 S1
- CHAMBERLAIN ROAD 7 S1
- CHAMBERLAIN ROAD 7 S2
- CHAMBERLAIN ROAD 7 S3
- JACK PINE ROAD S1
- LITTLE ROAD S1
- MARSH ROAD S1
- STONEY LONESOME RD S1
- STONEY LONESOME RD S2
- WAWBEWAWA ROAD S1
- WAWBEWAWA ROAD S3
- WAWBEWAWA ROAD S4
- WAWBEWAWA ROAD S5
- WAWBEWAWA ROAD S6
- WEST RD S2
- WEST ROAD S1

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
Gravel	4	64.98	80	62	Good	27	82%
	5	0.00	70	N/A	N/A	N/A	N/A
	6	8.50	60	60	Good	35	68%
	Seasonal	0.62	40	45	Fair	45	0%
TOTAL		**74.10**	**n/a**	**61**	Good	**27**	

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	4	64	$ 10,805,889.01
Culvert	6	39	$ 2,859,093.13
TOTAL	**10**	**58**	**$ 13,664,982.14**

Figure 2-3

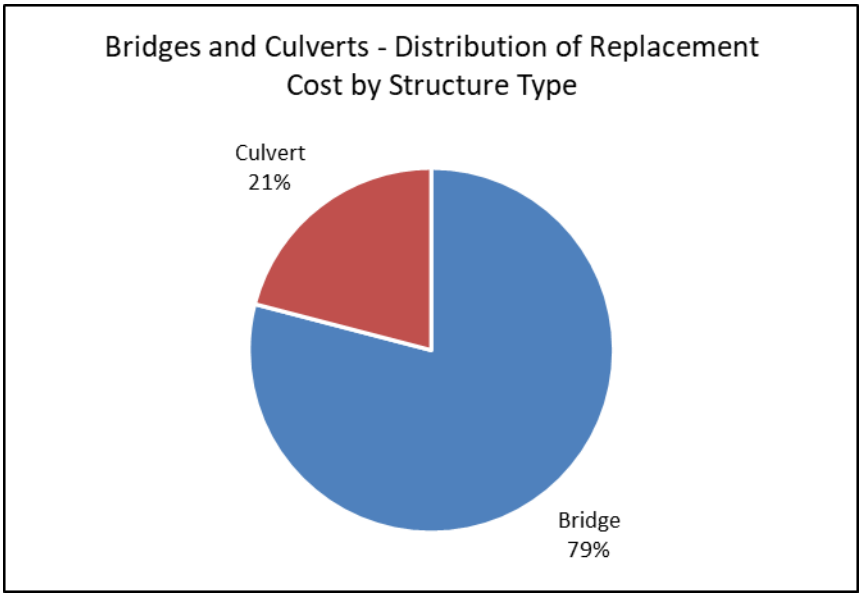
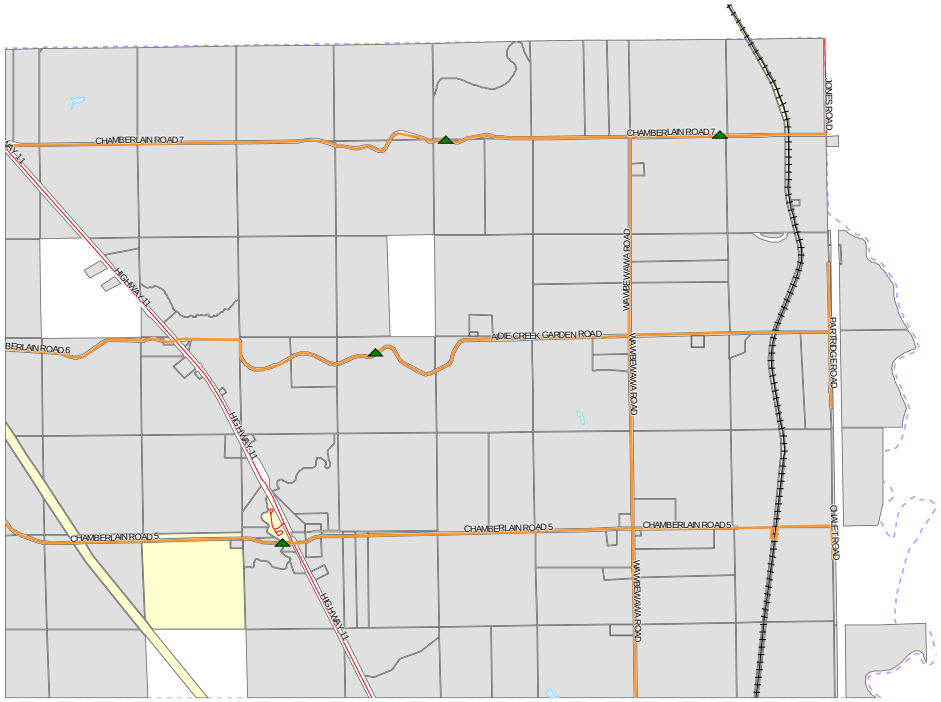


Figure 2-4

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 asset. A BCI score is provided on a numeric scale of 0-100, and is a measure of the overall condition of the structure based on an evaluation of individual components. Similar to road assets, to better communicate the condition of the bridge and culvert network, the numeric condition ratings have been segmented into qualitative condition states as summarized

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.	$9,174,874.60
61	75	Fair	Some elements exhibit significant deficiencies, Asset requires attention.	$2,973,935.84
75	90	Good	Good condition, few elements exhibit existing deficiencies.	$ -
90	100	Very Good	Well maintained, good condition, new or recently rehabilitated.	$1,516,171.71

As summarized in Table 2-10, our bridges are, on average, in a "Poor" condition state, while culverts are in also in a "Poor" condition state. Assessed for the entire bridge and culvert network, all structures provide an average BCI of 39, representing a "Poor" condition state. The lowest observed condition in the bridge network is 38.8 (Poor), and for culverts is 0.8 (Poor). All culverts are in the Poor or Fair condition whereas one bridge is listed as Very Good. The following bridges and culverts are listed in poor and fair condition:

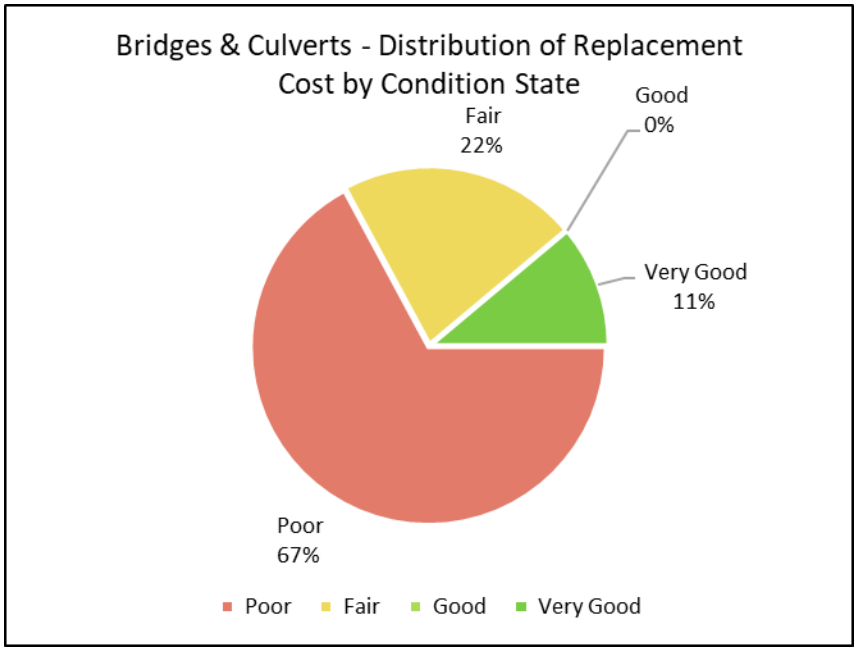
Condition	Bridges	Culverts
Poor	Aidie Creek Krugerdorf Bridge	Blackburn Culvert #3 Blackburn Culvert #4 Crocodile Creek #5 Crocodile Creek #6 West Road #2
Fair	Lyon's Bridge (Road 7)	Crocodile Creek #1

Table 2-10

Bridge and Culvert Condition Average

Type	Quantity	BCI (Weighted Average)	Minimum Observed BCI	Average Condition State
Bridge	1	56	56	Poor
Culvert	3	53	39	Poor
TOTAL	**4**	**53.4**	**39**	Poor

Figure 2-5



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	Krugerdorf Bridge has load restrictions which limit traffic. 10% of the overall network.
	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 as at least a 75 or Good rating. Currently, only one bridge is meeting the desired level of service.

2.4 Road Culverts

2.4.1 State of Local Infrastructure

The Municipality currently owns and maintains 193 culverts with a 2022 replacement value totaling approximately $319,102. 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 – Material Type

Culvert Type	Quantity	Age (Weighted Average)	Replacement Cost
Metal	184		$299,783
Cement	2		$10,452
Plastic	7		$8,867
TOTAL	**193**	**21**	**$319,102**

Figure 2-6

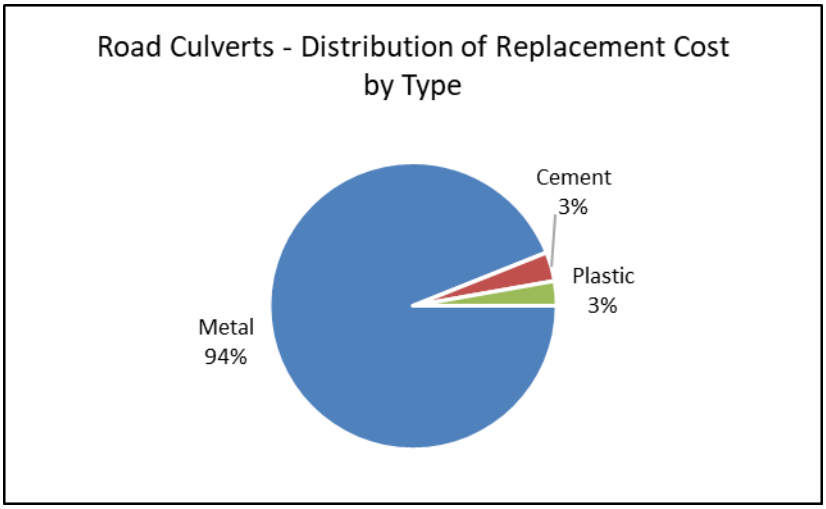


Table 2-13

Culvert Network - Size

Culvert Diameter	Quantity	Age (Weighted Average)	Replacement Cost
<=375mm (15 inches)	45	[redacted]	$25,138
375 mm - 750 mm	116		$166,480
>750 mm (30 inches)	32		$127,484
TOTAL	**193**	**21**	**$319,102**

Figure 2-7

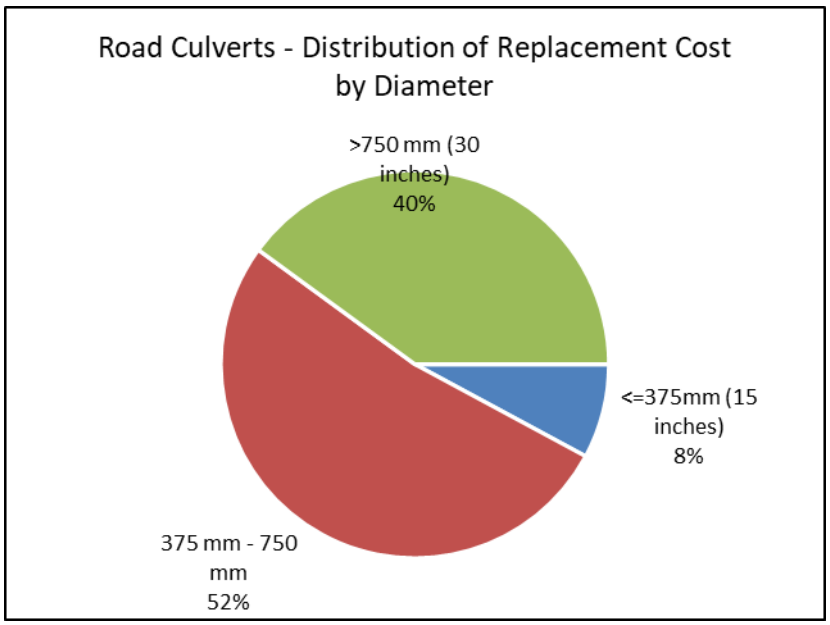
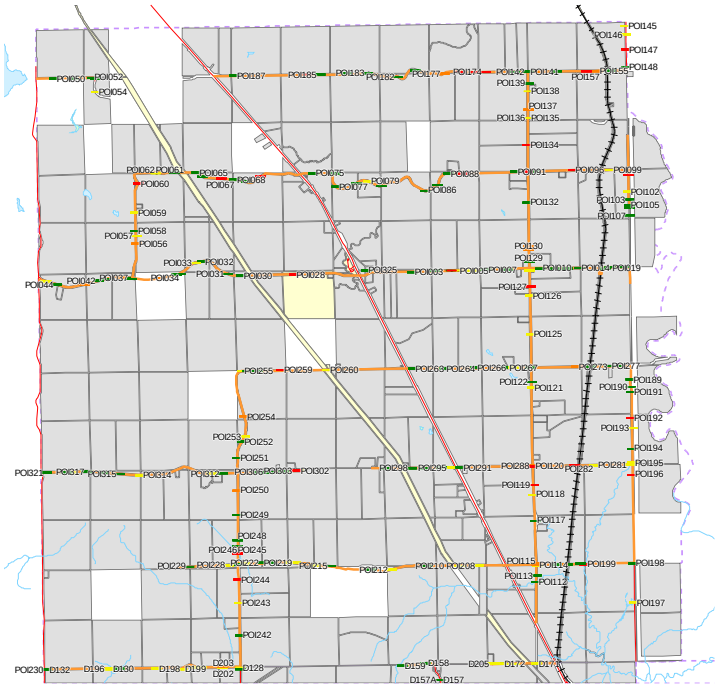


Figure 2-8

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 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.

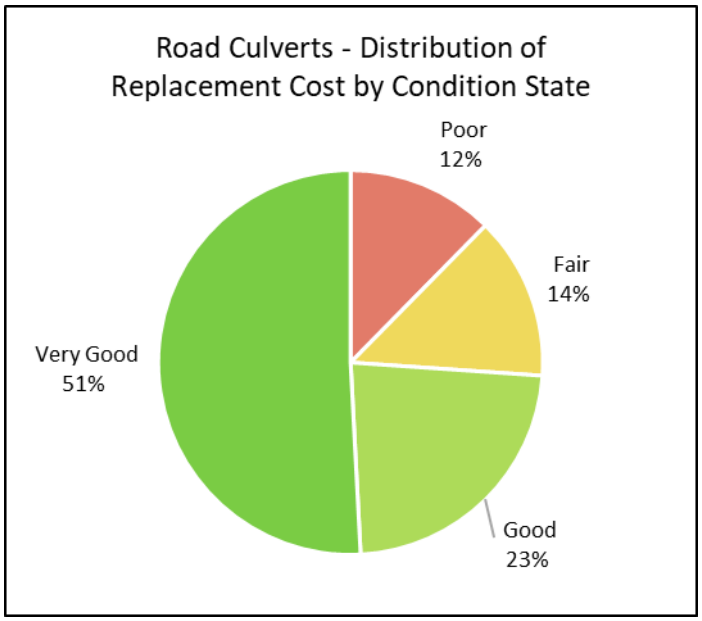
Table 2-14 summarizes the various physical condition ratings and the condition state they represent for culvert assets. There are 19 culverts in poor condition and 25 culverts in the fair condition.

Table 2-14

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.	$39,490
2	Fair	Some elements exhibit significant deficiencies, Asset requires attention.	$43,782
3	Good	Good condition, few elements exhibit existing deficiencies.	$73,627
4	Very Good	Well maintained, good condition, new or recently rehabilitated.	$162,204

Figure 2-9



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 2-15

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 2-9 depicts the Municipality's culvert network by surface type
	Quality	Figure 2-9 summarized 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, 44 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 2-16

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.	19
2	Fair	Some elements exhibit significant deficiencies, Asset requires attention.	25
3	Good	Good condition, few elements exhibit existing deficiencies.	55
4	Very Good	Well maintained, good condition, new or recently rehabilitated.	94

2.5 Railway Crossings

2.5.1 State of Local Infrastructure

The Municipality currently has seven railway crossings which travel across its roads. The responsibility for the repairs to these crossings are continuing to be a matter of debate. Often the cost falls onto the Townships instead of the Ontario Northland Rail Network and we have included it within our plan.

Table 2-17

Railway Crossings

Crossing	Year Round	Seasonal	Detour Available	Approximate Cost	Average Age
Road 7	0	0	Yes	$ 17,000.00	1906
Aidie Creek	1	1	No	$ 17,000.00	1906
Road 5	0	1	No	$ 17,000.00	1906
Road 4	5	1	Yes	$ 17,000.00	1906
Road 3	3	1	Yes	$ 17,000.00	1906
Road 2	0	0	Yes	$ 17,000.00	1906
Alpine Road	1	0	No	$ 17,000.00	1906

2.5.2 Condition

The Municipality has used a four point scale as listed below to rate the condition of the crossings. The Crossings have been given a useful life of 100 years with anything over 140% listed as poor. This expected life has been estimated based on internet research. The Municipality currently only has the age of its railway crossings to inform condition.

Table 2-18

Culvert Condition States Defined with Respect to Physical Condition

UL%	Condition State	Replacement Value
140% ≤ UL%	Poor	$0
90% ≤ UL% < 140%	Fair	$119,000
45% ≤ UL% < 90%	Good	$0
UL% < 45%	Very Good	$0

Figure 2-10

The railway tracks went in at the same time in 1906. This gives all the crossings the same again. All crossings are in the "Fair" category.

Crossing	Year Round	Seasonal	Detour Available	Approximate Cost	Average Age	Useful Life	Condition
Road 7	0	0	Yes	$ 17,000.00	1906	116%	Fair
Aidie Creek	1	1	No	$ 17,000.00	1906	116%	Fair
Road 5	0	1	No	$ 17,000.00	1906	116%	Fair
Road 4	5	1	Yes	$ 17,000.00	1906	116%	Fair
Road 3	3	1	Yes	$ 17,000.00	1906	116%	Fair
Road 2	0	0	Yes	$ 17,000.00	1906	116%	Fair
Alpine Road	1	0	No	$ 17,000.00	1906	116%	Fair

2.5.3 Current Levels of Service

The levels of service currently provided by the Municipality's railway crossings 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	Railway Crossings are utilized by passenger vehicles, emergency vehicles, pedestrians, cyclists, farm equipment and heavy transport vehicles.
	Quality	The table above details our crossings in qualitative condition states. Crossings in a poor, or worse, condition state could face possible load restrictions, or access issues.
Technical Levels of Service	Scope	The table above depicts the Municipality's crossing network
	Quality	The Table above summarizes the average condition of the Municipality's culvert network

2.5.4 Proposed Levels of Service

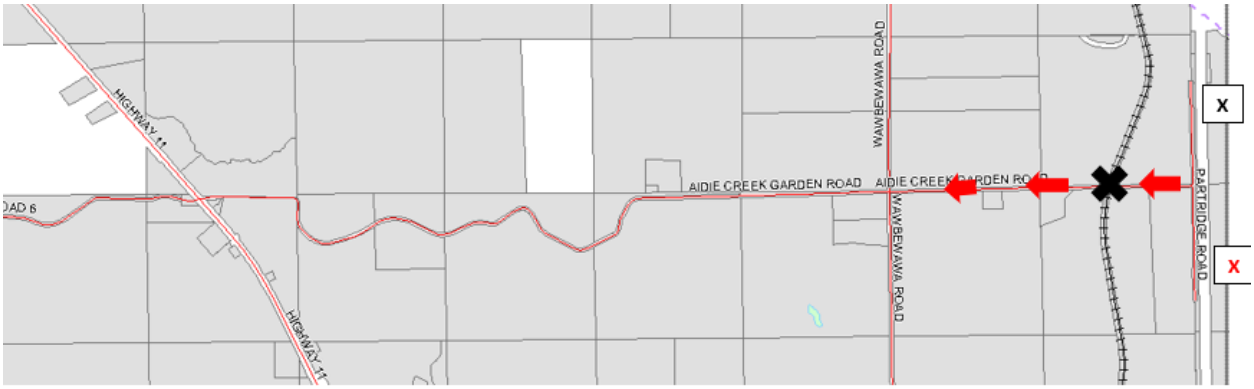
With the aging assets all at the same time the risk is that they could fail quickly one after another. The railway crossings in some cases are the sole access for a resident to their home, farm, or property. In other cases, the detours are so long that they may effectively cut off service to properties for emergency services. The municipality is proposing to maintain all existing crossings but with the large costs some with detours may be done over the longer term to spread out the costs. Others with no detours will need an immediate fix.

Crossing	Year Round	Seasonal	Detour Available	Proposed Service
Road 7	0	0	Yes	Multi-year
Aidie Creek	1	1	No	Immediate
Road 5	0	1	No	Immediate
Road 4	5	1	Yes	Multi-year
Road 3	3	1	Yes	Multi-year
Road 2	0	0	Yes	Multi-year
Alpine Road	1	0	No	Immediate

Figure 2-11

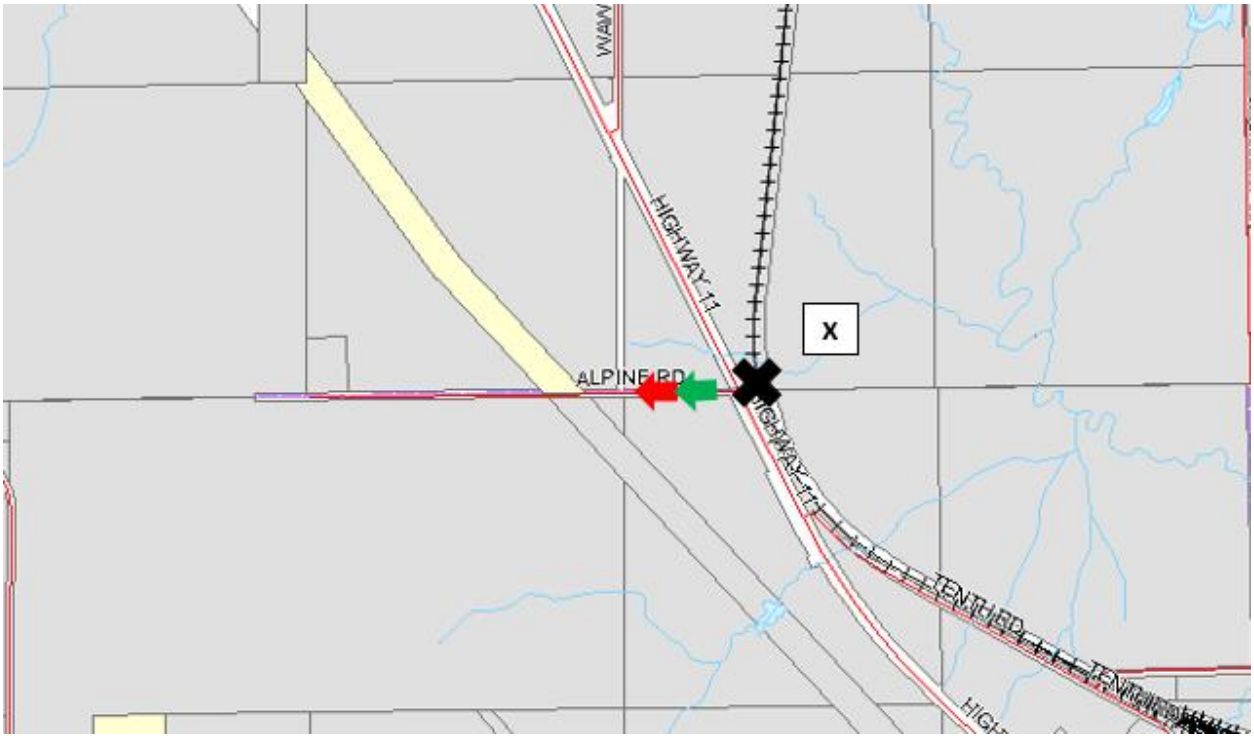
Crossings with no Detour

Aidie Creek



Road 5

Alpine Road



2.6 Facilities

2.6.1 State of Local Infrastructure

The Municipality currently owns and manages 5 buildings, and one park, with a 2022 replacement value totaling approximately $577,764. Facilities assets range in cost with a breakdown of facility asset numbers and replacement costs by category provided in Table 2-19. Please note that for larger facilities the structure itself has not been included in the replacement costs.

Table 2-19

Facility – Average Age and Replacement Cost

Facility	Age (Weighted Average)	Replacement Cost
Community Hall	29	$ 138,737.24
Municipal Shop (New)	13	$ 78,500.00
Municipal Shop (Old)	62	$ 154,130.16
Sand/Salt Shed	39	$ 88,754.54
Ballfield and Park	12	$ 114,582.46
Waste Site	1	$ 3,060.00
TOTAL	**41**	**$ 577,764.39**

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 2-20 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 2-20

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.	$121,525
90% ≤ UL% < 140%	Fair	Some elements exhibit significant deficiencies, Asset requires attention.	$216,789
45% ≤ UL% < 90%	Good	Good condition, few elements exhibit existing deficiencies.	$117,692
UL% < 45%	Very Good	Well maintained, good condition, new or recently rehabilitated.	$121,758

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 one facilities in poor condition – the Sand/Salt Shed.

Table 2-21

Facilities – Average Condition State

Facility	% Life Used (Weighted Average)	Average Condition State	Annual Lifecycle Costs
Community Hall	110%	Fair	$ 96,222.82
Municipal Shop (New)	56%	Good	$ 10,921.57
Municipal Shop (Old)	124%	Fair	$ 154,130.16
Sand/Salt Shed	156%	Poor	$ 88,754.54
Ballfield and Park	46%	Good	$ 17,882.50
Waste Site	10%	Very Good	$ 340.00
TOTAL	**100%**	Fair	**$ 368,251.59**

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
Community Hall	Windows Office Floors Refrigerator Stove Furnace x 2 Sinks and Toilets Septic System Radios	Interior Painting Hall Floors Ceiling Fans Hot Water Tank Eavestroughts Desks and Counters Signage	$91,929
Municipal Shop (New)	Hot Water Tank Signage	Interior Painting	$3,500
Municipal Shop (Old)	Structure	None	$154,130
Sand/Salt Shed	None	Structure	$88,754
Ballfield and Park	None	None	$0.00
Waste Site	None	None	$0.00
TOTAL	**11**		**$ 338,313**

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 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 8 pieces of equipment, with a 2022 replacement value totaling approximately $997,268. This value represents a Shared Service Agreement with the Municipality of Charlton and Dack 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 2-22 provides a summary of quantity, expected useful life, age, and replacement value of Municipality equipment assets. The average age of Unshared vehicles is 8 years and of Shared Vehicles is 12 years. The average age of Unshared equipment is 14 years and of Shared equipment is 7 years. Overall, the municipality has vehicles and equipment with an average age of 9 years.

Table 2-22

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	34%	8	$ 166,195.70	36%	Very Good
	Shared	2	69%	12	$ 44,927.88	85%	Good
Equipment	Unshared	2	13%	14	$ 619,210.66	16%	Very Good
	Shared	6	11%	7	$ 166,934.73	51%	Very Good
TOTAL		**12**		**9**	**$ 997,268.96**	**85%**	Very Good

Figure 2-12

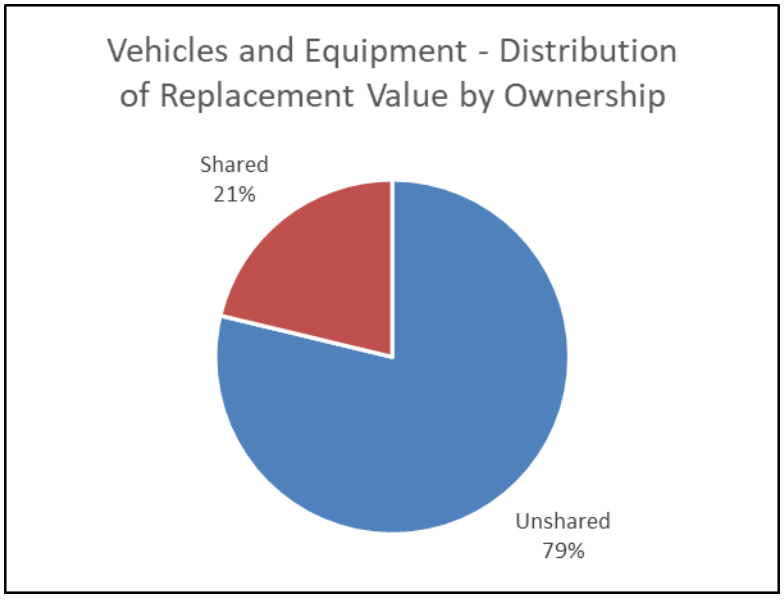
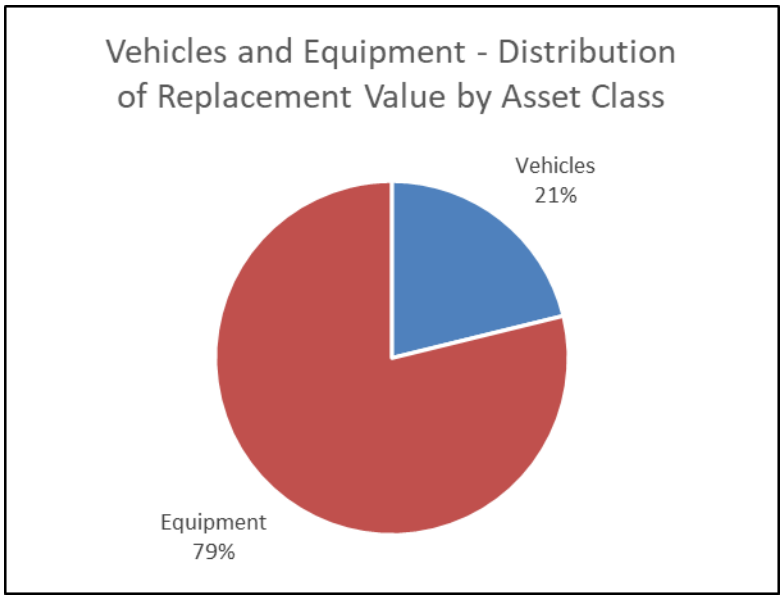


Figure 2-13



2.7.2 Condition

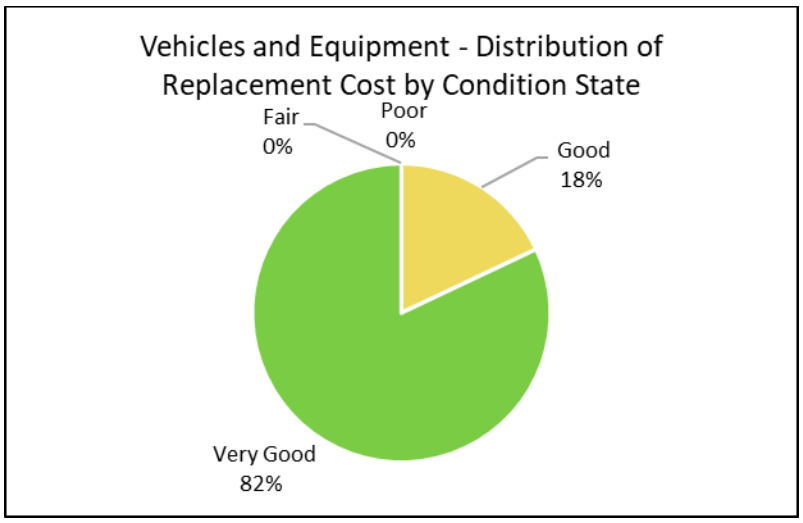
The Municipality currently only has the age of its fleet to inform condition. We have used a four class condition state to with expected useful life that could exceed 100%. As presented, the average age of our fleet is 8 years, or a "Very Good" condition state. The next Unshared Vehicle up for replacement is the 2018 Chevrolet Pickup truck due for replacement in 2028 with a 2022 value of $48,075. 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 (Chamberlain responsible for 50%). The next Unshared Equipment up for replacement is the 1996 Backhoe due for replacement in 2027 at an estimated 2022 cost of $123,356. The next Shared Equipment up for replacement is the 2015 trailer due for replacement in 2028 at an estimated value of $13,439.

Table 2-23

Vehicles and Equipment – Condition State

UL%	Condition State	Replacement Value
140% ≤ UL%	Poor	$0
90% ≤ UL% < 140%	Fair	$0
45% ≤ UL% < 90%	Good	$179,339
UL% < 45%	Very Good	$817,930

Figure 2-14



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	The table above depicts the Municipality's vehicle and equipment.
	Quality	The table above depicts theTable 2-22 summarized the average condition of the Municipality's vehicles and equipment.

2.7.4

2.7.5 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%. Currently, no equipment exceed 100% of its expected life.

2.8 Signs

2.8.1 State of Local Infrastructure

The Municipality currently owns and manages 53 signs with a 2022 replacement value totaling approximately $2650. 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 $2650.

Table 2-24

Signs – Average Age and Replacement Costs

Sign Type	Quantity	Average Condition	Minimum Condition	Average Condition State	% Reflective	Replacement Cost
Children at Play	3	2.00	1.00	Fair	33%	$ 150.00
Danger	2	2.00	1.00	Fair	50%	$ 100.00
General Information	0	N/A	N/A	N/A	N/A	$ -
Horse and Buggy	1	3.00	3.00	Good	0%	$ 50.00
Intersection	1	3.00	3.00	Good	100%	$ 50.00
Municipality Welcome	0	N/A	N/A	N/A	N/A	$ -
No Exit	6	2.67	2.00	Fair	83%	$ 300.00
No Snowmobiling	0	N/A	N/A	N/A	N/A	$ -
No Trespassing	0	N/A	N/A	N/A	N/A	$ -
Railroad Crossing	0	N/A	N/A	N/A	N/A	$ -
Recreation and Cultural Interest	0	N/A	N/A	N/A	N/A	$ -
Route Marker	0	N/A	N/A	N/A	N/A	$ -
School Bus Stop Ahead	0	N/A	N/A	N/A	N/A	$ -
Seasonal Road	1	2.00	2.00	Fair	0%	$ 50.00
Speed Regulation	2	3.00	3.00	Good	100%	$ 100.00
Stop	37	2.46	1.00	Fair	86%	$ 1,850.00
Street Sign	0	N/A	N/A	N/A	N/A	$ -
Turn and Curve	0	N/A	N/A	N/A	N/A	$ -
Yield	0	N/A	N/A	N/A	N/A	$ -
TOTAL	**53**			**Poor**	**81%**	**$ 2,650.00**

2.8.2 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 2022, 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 2-25

Signs-Condition Rating

Physical Condition	Condition State	Quantity	Replacement Value
1	Poor	19	$950
2	Fair	0	$0
3	Good	34	$1,700
4	Very Good	0	$0

2.8.3 Current Levels of Service

The Municipality currently has 19 signs in the poor condition and no 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 81% reflectivity rate with a low of 0% to a high of 100%.

2.8.4 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.

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 Municipality staff. The lifecycle activities that the Municipality currently employs in the management of its roads include:

- 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)

Table 3-1 details the costs associated with undertaking these lifecycle activities. 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

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 will need to be done approximately every 40 years but when 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 length and reduces long term costs. The difference between Class 4 and the other road types reflect the increased traffic that occurs on these roads.

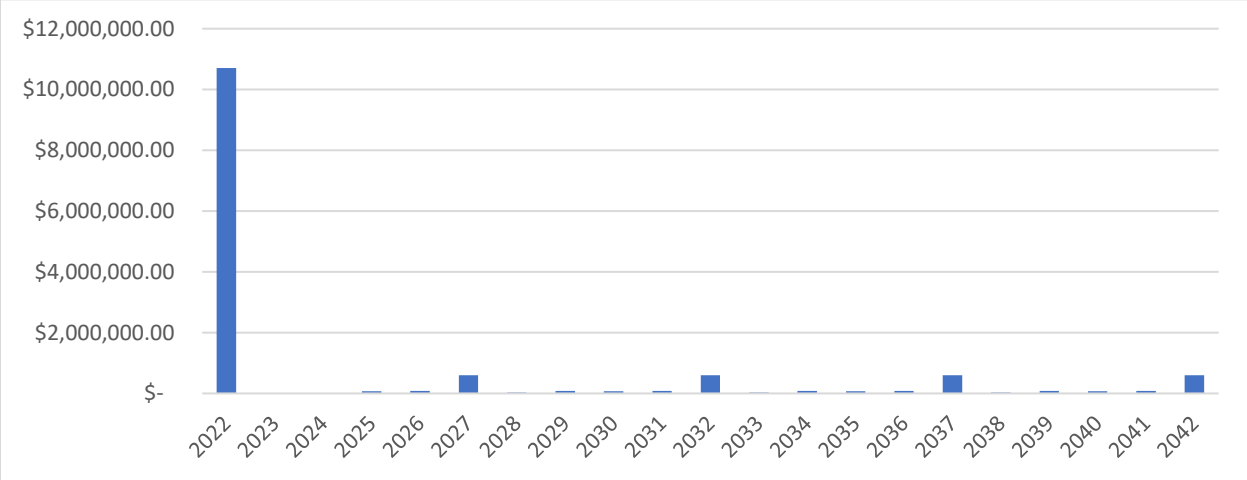
Surface Type	Year	Lifecycle Activity
Class 4 Gravel Roads	5	Top Up
Class 5, 6, Seasonal Gravel Roads	7	Top Up

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 $669,607, 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	Aidie Creek	56.4	1987	Poor	75	40	$ 845,469.55	$1,800,000.00	213%
Bridge	Bailey Bridge (Road 5)	98.5	2018	Very Good	75	71	$ 1,516,171.71	$ -	0%
Bridge	Lyon's Bridge (Road 7)	64.1	1991	Fair	75	44	$ 2,057,778.02	$1,300,000.00	63%
Bridge	Krugerdorf Bridge	38.8	1930	Poor	75	-17	$ 6,386,469.74	$2,390,000.00	37%
Culvert	Blackburn Culvert #3	0.8	1991	Poor	50	19	$ 273,964.53	$1,000,000.00	365%
Culvert	Blackburn Culvert #4	33.3	1990	Poor	50	18	$ 274,268.93	$ 320,000.00	117%
Culvert	Crocodile Creek #1	63	1995	Fair	50	23	$ 453,300.52	$ 150,000.00	33%
Culvert	Crocodile Creek #5	34.3	1978	Poor	50	6	$ 714,201.51	$ 5,000.00	1%
Culvert	Crocodile Creek #6	53.4	1975	Poor	50	3	$ 680,500.34	$ 320,000.00	47%
Culvert	West Road #2	60.7	1982	Poor	50	10	$ 462,857.31	$ 150,000.00	32%

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 Municipality 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

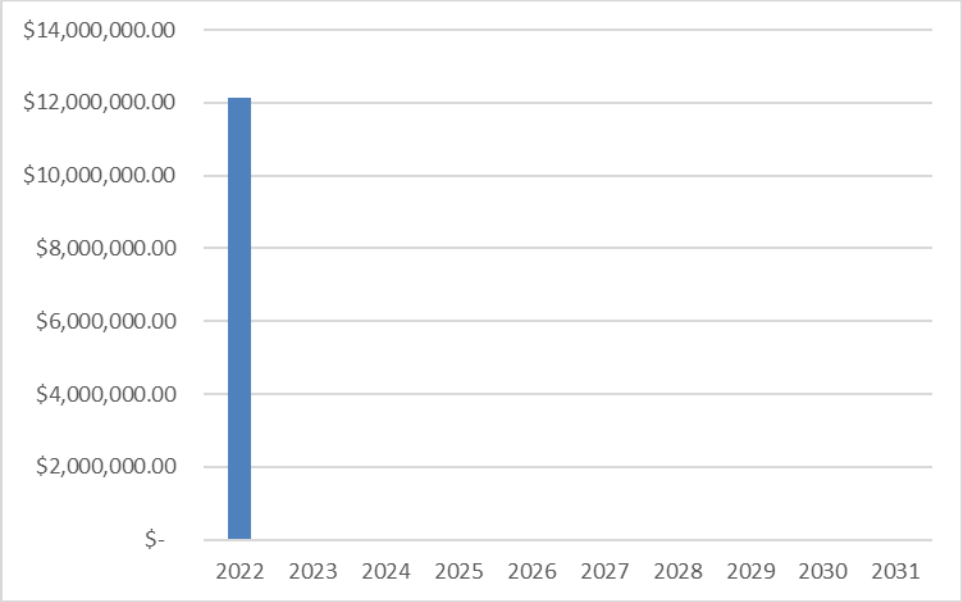
Lifecycle Strategy – Culverts

3.3.5 Capital Costs / Forecast

This is the forecast without and budgetary constraints. It includes the complete reconstruction of nine of the structural culverts and bridges as they fall in the fair or poor category. This creates an average annual investment of $1,214,881 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 Municipality 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.

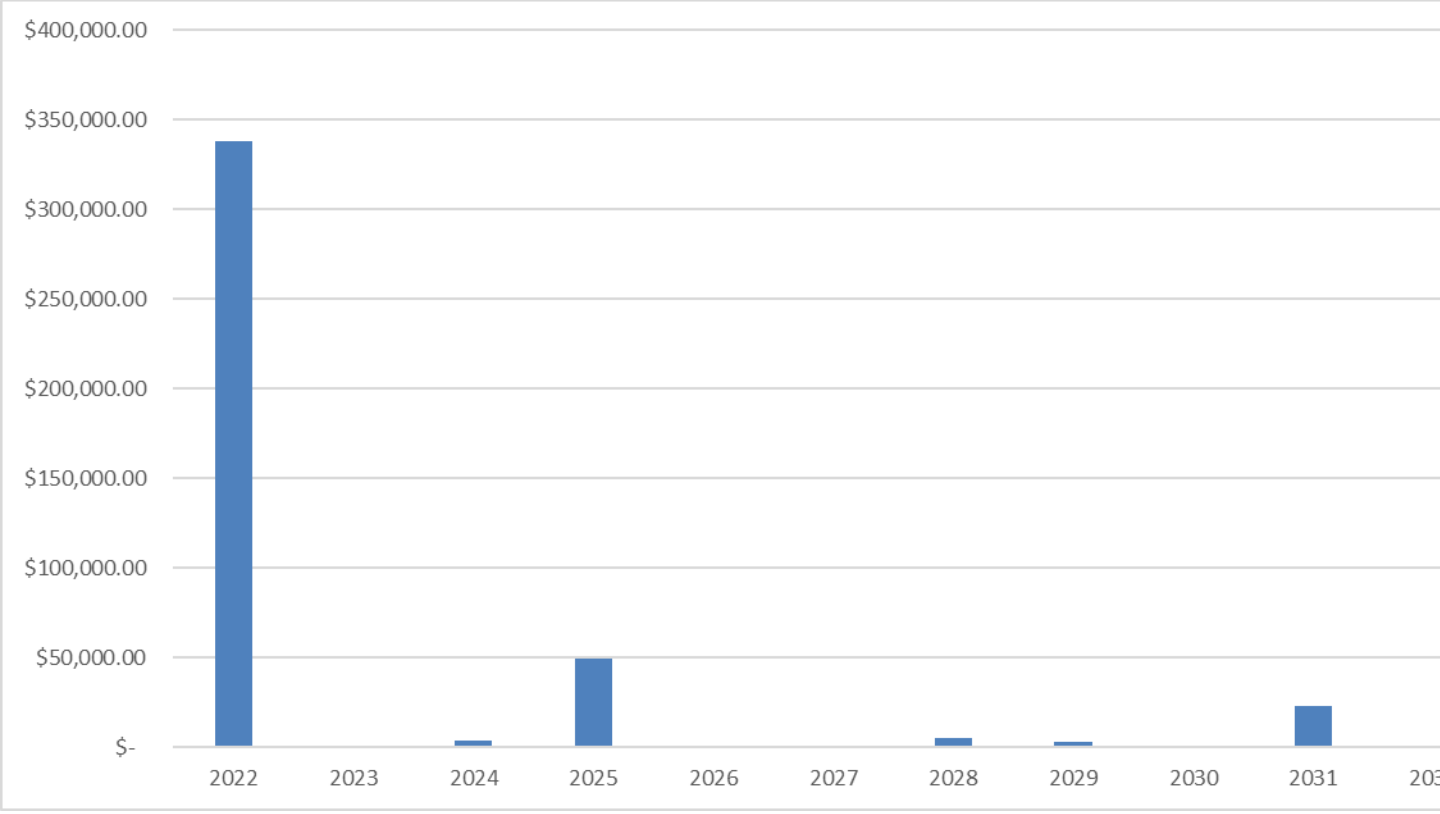
UL%	Condition State	Condition Definition	Lifecycle
140% ≤ UL%	Poor	Widespread signs of deterioration, some assets may be unusable. Service is affected.	Replacement
90% ≤ UL% < 140%	Fair	Some elements exhibit significant deficiencies, Asset requires attention.	Replacement
45% ≤ UL% < 90%	Good	Good condition, 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 $38,442for a total 10 year investment of $368,251. This would address items in the poor and fair categories across the facilities.

3.5 Road Culverts

3.5.1 Lifecycle Activities

This section will detail the capital treatments as developed through discussions with Municipality 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

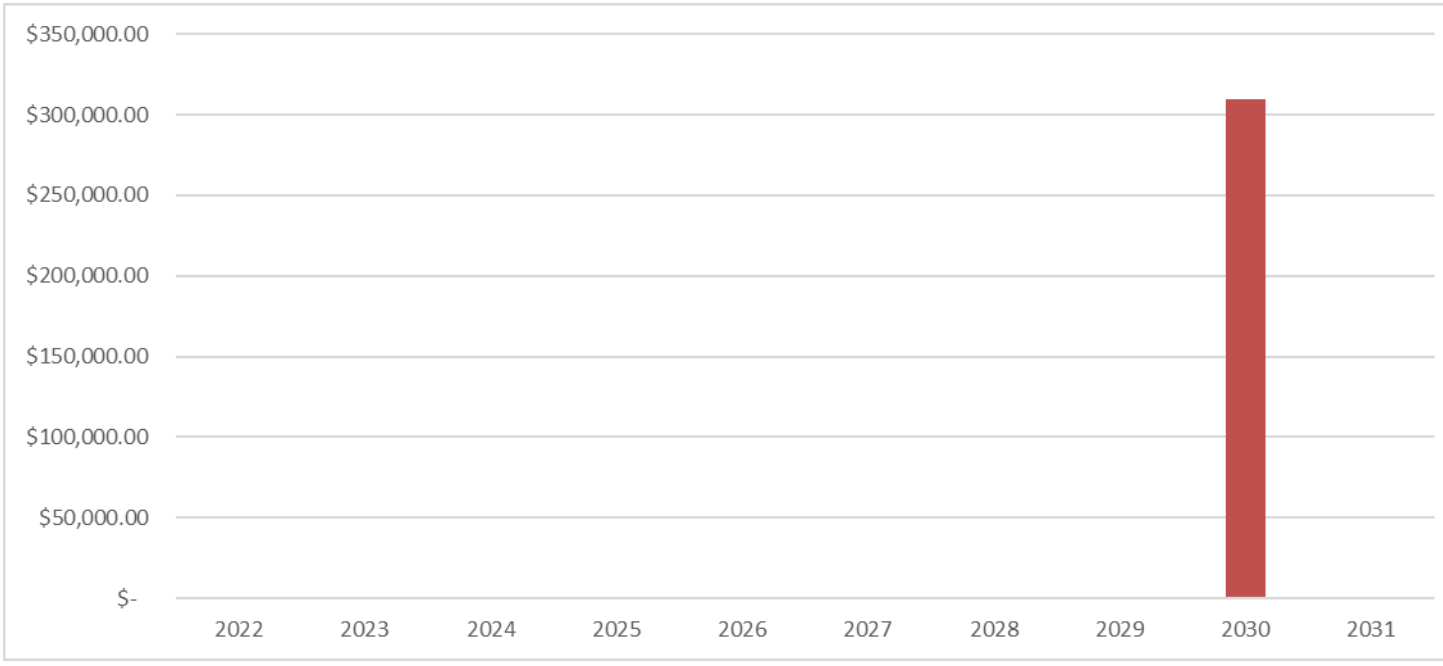
Assets deteriorate over time, eventually reaching a point where they have no remaining service life left. The municipality, in discussions with staff, have determined that most assets are either maintained or in need of replacement. When culverts reach either the poor or fair state they are flagged as 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 $30,988 for a total 10 year investment of $309,881. 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 signs 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 municipalities expect 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 $265 would be required over the next 10 years for a total of $2650 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:

- Vehicles and Equipment;
- Railway Crossings.

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.

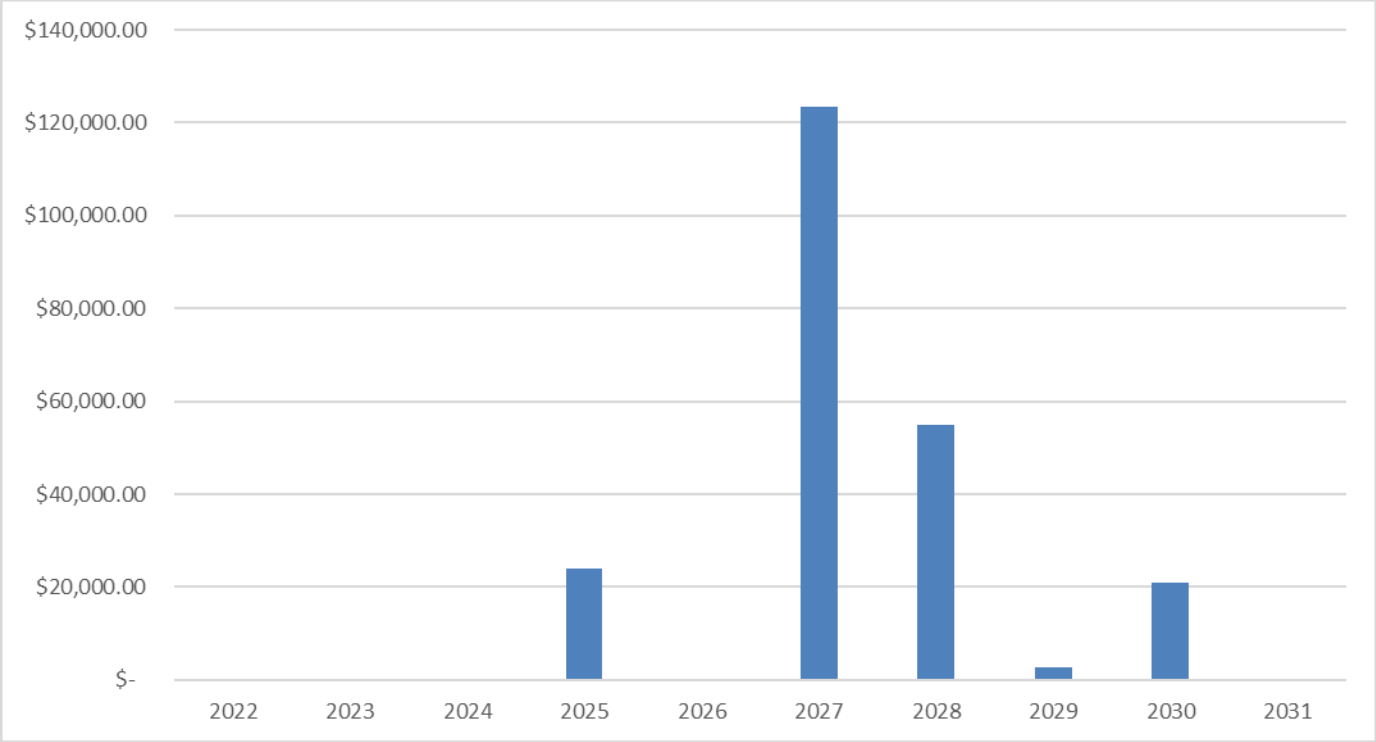
3.7.5 Capital Costs / Forecasts

3.7.5.1 Vehicles and Equipment

The vehicles and equipment need an average annual investment of $22,573 over 10 years 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 3-6

Vehicles and Equipment over the Next 10 Years



3.8 Population

Based on the most recent census the municipality has a population of 332 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

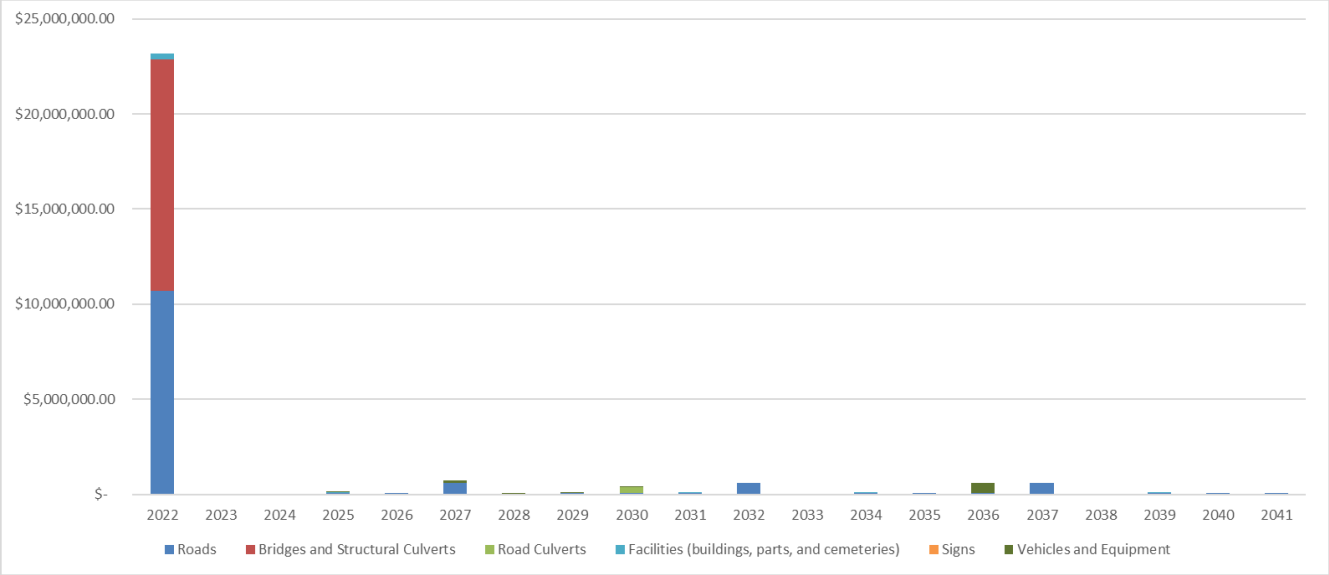


Table 4-1

2022 Capital Investment Needs

Expense	2022
Roads	$ 10,705,507.48
Bridges and Structural Culverts	$ 12,148,810.44
Road Culverts	$ -
Facilities (buildings, parts, and cemeteries)	$ 338,313.94
Signs	$ -
Vehicles and Equipment	$ -
Total	$ 23,192,631.86

To address the immediate capital needs of the municipality would require $23,192,631 in 2022 with roads and bridges containing the largest dollar amounts.

Figure 4-2

Average Annual Capital Investment Needed

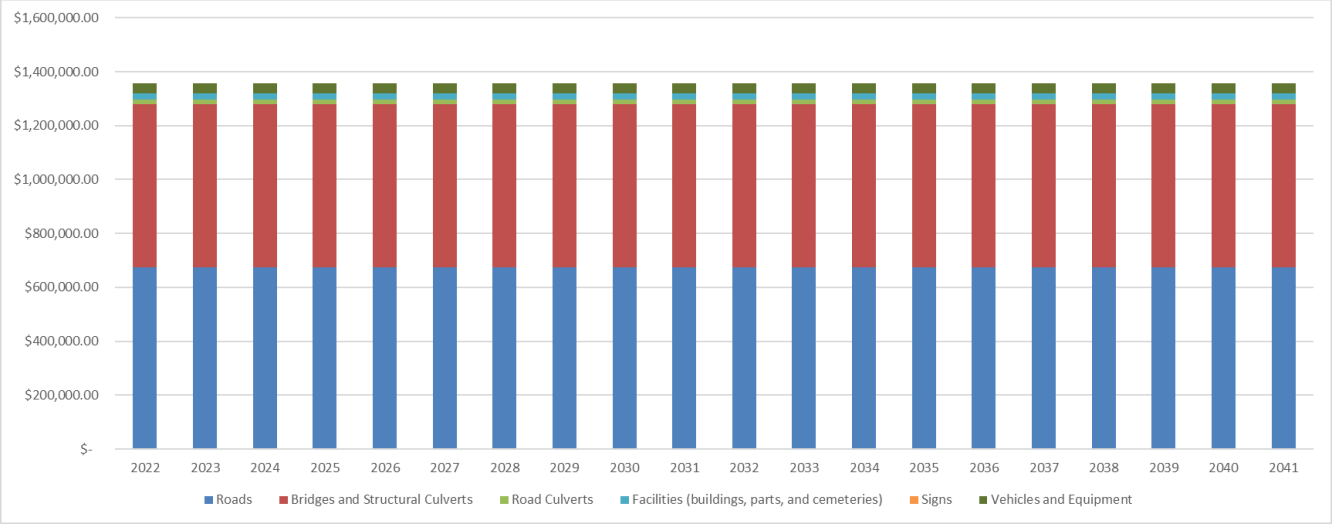


Table 4-2

Average Annual Capital Investment Needs

Expense	Annual
Roads	$ 673,090.80
Bridges and Structural Culverts	$ 607,440.52
Road Culverts	$ 15,494.09
Facilities (buildings, parts, and cemeteries)	$ 24,553.30
Signs	$ 132.50
Vehicles and Equipment	$ 36,079.33
Total Tax Supported	**$ 1,356,790.53**

To better address the long term needs of the municipality, an average annual investment of $1,356,790.53 is needed for tax supported items annually over the next 20 years.

4.3 Funding Shortfall

Reserves

The Reserve position at December 31, 2020 was $452,317, representing $2741 per household. The reserve position does include $16,749 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.

	2020
Reserves	
Working capital reserve	$ 318,334
Modernization reserve	50,838
Machinery replacement reserve	-
Fire truck reserve	-
Ball diamond reserve	5,900
ONR crossing reserve	12,000
Recreation committee reserve	26,917
Parks and recreation reserve	6,900
COVID 19 safe restart funding reserve	14,679
Fire department reserve	16,749
	452,317

Current Debt

At December 31, 2020 the Township had loans totaling $637,287. This represents debt related to the replacement of the Road 5 Bailey Bridge which matures in December 2039 and the purchase of a Grader which matures in July 2027. This gives us an Annual Repayment Limit of $139,782 – which represents 25% of revenues less net debt charges. The Township is currently using 11% of its annual levy to fund debt payment.

Taxation

The Township currently has a levy of $691,922 which includes about $10,000 annually toward capital costs. The Township greatly depends on grants to fund its capital program. According to the Ministry of Municipal Affairs and Housing the average residential household pays $1635 which makes up 2.6% of a median household income. Increasing costs in other areas put a limit on what the Township is able to increase to fund capital costs. Many of its roads are used to service the unorganized Townships adjacent to the municipality and we do not have the ability to tax these properties.

Overall Financial Impact

This financing strategy is fully funded only through a tax increase of 177%. This large increase is due to the small nature of the municipality – 165 households. Unfortunately, the shortfall in infrastructure greatly exceeds the municipalities repayment limit of $139,782 annually and our operating reserves would not make an impact. 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 temporarily 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 20% to cover its 10% share over the longer term.

Table 4-3

Capital Revenue Estimates

Income	2022
Gas Tax	$ 21,058.00
OCIF	$ 100,000.00
Municipal	$ 10,000.00
Total	$ 131,058.00