



Road, Bridge and Stormwater Networks

ASSET MANAGEMENT PLAN

2022

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Executive Summary

The Township of Ramara undertook an Asset Management Plan development in response to Ontario Regulation 588/17 -Asset Management Planning for Municipal Infrastructure under the Infrastructure for Jobs and Prosperity Act. Staff worked to gather asset information for the road network, bridges and structural culverts and stormwater management networks, plotting the assets in the municipality's GIS mapping and verifying and updating the data in contained within the Enterprise Asset Management system Citywide. This document explains in detail the state of the infrastructure, replacement costs, condition, levels of service, life cycle activities and performance measures of the assets. The Financing Strategy for each asset group is also outlined for the next ten years in Capital spending. Lastly the Funding Gap for the infrastructure portfolio is calculated and reviewed.

Overall the Township's Core Assets are in generally good condition as shown in the summary below:

Asset Class	Description	Average Condition	Replacement Cost	Average Age
Paved Roads	165 km of hard surfaced LCB/HCB roads	FAIR	\$124,379,000	33 years
Unpaved Roads	188km of unpaved roads including 8km of Earth Roads	FAIR	\$18,800,000	96 years
Sidewalks	5 km of sidewalks	GOOD	\$337,500	19 years
Trails and Paths	9.08km of trails and Paths	GOOD	\$363,200	10.5 years
Streetlights	528 Streetlights	GOOD	\$2,640,000	6.5 years
Bridges	19 Bridges	POOR	\$10,000,000	49 years
Foot bridges	2 footbridges in Lagoon City	POOR	\$497,500	15 years
Structural Culverts	5 Structural Culverts	GOOD	\$1,900,000	48 years
Stormwater Ponds	5 Stormwater Management Ponds	GOOD	\$2,500,000	16 years
Stormwater Linear	521 meters of linear storm water sewer	VERY GOOD	\$724,500	12 years
Lake Outlets	41 Lake Outlets	GOOD	\$205,000	20 years
Catch Basins, Manholes, Inlets, Stormceptor	25 units in total	VERY GOOD	\$274,000	12 years

The total estimated replacement cost for the assets in this plan is \$163,373,364.

Recommendations

The following recommendations are providing for the management of the assets within this plan.

1. This Asset Management Plan should be updated on an annual basis to reflect the changes to the assets regarding improvement, expansions, replacement costs and inflation
2. The Township should further develop the asset inventory for the core assets in this plan and close any highlighted knowledge/data gaps.
3. Asset replacement plans should be developed to enable the proactive and efficient replacement of aging assets
4. Funding should be allocated to reserve funds to aid in closing the infrastructure gap
5. A roads study should be performed every five years using the Pavement Condition Indexing to ensure an accurate assessment of the roads.
6. Traffic Counts should be updated often on the roads.
7. Further assessments of the Township's bridges should be done in accordance with the Bridge Study.
8. Assets within a specific section of road should be tied to the road using the Coordinated ID in Citywide to facilitate coordinated activities.
9. The Township should develop and maintain a master list of procedures (operating/maintenance) and update existing procedures. Existing unwritten procedures should be formalized, creating new procedures if necessary.
10. Develop an asset hierarchy to support decision making

1.0 Introduction

Asset management is the coordinated activities in place to manage the way in which the Township realizes value from its assets in order to provide services effectively and in a financially sustainable manner.

The purpose of this Asset Management (AMP) is to improve the Township of Ramara's ability to meet corporate goals and objectives to best service its constituents. It will provide guidance that enables processes to manage costs, risk and levels of service for the Township's assets. The AMP should help identify future costs and highlight future potential problems that may effect our desired service delivery. This will allow staff to remove physical, financial and political barriers before they impact levels of service.

Building and refining our asset management plan is an iterative process. Over time the processes and plans will be built on better information and will be continuously improved; being updated every five years.

Capital assets will be recorded using the Tangible Capital Asset Policy with some exceptions. Assets that do not fall within the threshold of the TCA Policy, but will be

captured if pooled will be recorded and managed separately to ensure the condition and asset management activities are carried out in a responsible manner.

The Asset Management Plan captures assets that the Township does not own but is financially vested in. These assets which are generally not captured by the TCA Policy should be included in capital and asset management planning.

Ontario Legislation

The Province of Ontario published 'Building Together: Guide for Municipal Asset Management Plans' (AMP) in 2012 to encourage and support municipalities in Ontario to develop AMP(s) in a consistent manner.

In 2015, Ontario passed the Infrastructure for Jobs and Prosperity Act, which affirmed the role that municipal infrastructure systems play in supporting the vitality of local economies. After a year-long industry review, the Province created *Ontario Regulation 588/17 -Asset Management Planning for Municipal Infrastructure under the Infrastructure for Jobs and Prosperity Act*. O.Reg 588/17 further expands on the Building Together guide, mandating specific requirements for municipal Asset Management Policies and Asset Management Plans, phased in over a five-year period.

O. Reg 588/17 has a phased approach with three deadlines of July 1, 2022, July 1, 2024, and July 1, 2025. The July 1, 2022 deadline is where 'Core' assets (water, wastewater, storm water, roads and bridges) will have an asset management plan documenting current levels of service.

The July 1, 2024 deadline requires 'all other' municipal infrastructure be included in the AMP documenting current levels of service. The final deadline (July 1, 2025) is to document proposed levels of service and financial strategies to fund these expenditures.

Compliance

For Township owned infrastructure assets, this AMP is compliant with the July 1, 2022 Regulation requirements for the Road Network, Bridges and Structural Culverts and Stormwater Management Network. The Township's operating authority OCWA will be providing the Asset Management Plan for the Water/Wastewater Network.

2.0 Glossary

Definitions

Arterial Roads – means Class 1 and Class 2 highways as determined under the Table to section 1 of Ontario Regulation 239/02 (Minimum Maintenance Standards for Municipal Highways) made under the *Municipal Act, 2001*.

Asset – something that has value to an organization. An asset extends beyond physical goods or hardware, and includes software, information, people, and reputation.

Collector Roads – means Class 3 and Class 4 highways as determined under the Table to section 1 of Ontario Regulation 239/02

Core municipal infrastructure asset – any municipal infrastructure assets that is a,

- (a) water asset that relates to the collection, production, treatment, storage, supply or distribution of water,
- (b) wastewater asset that relates to the collection, transmission, treatment or disposal of wastewater, including any wastewater asset that from time to time manages stormwater,
- (c) stormwater management asset that relates to the collection, transmission, treatment, retention, infiltration, control or disposal of stormwater,
- (d) road, or
- (e) bridge or culvert;

Consequence of Failure (CofF): The result of an asset reaching functional failure, which is measured as the impact or significance on the Corporation or its stakeholders.

Estimated Useful Life: an estimate of the average number of years an asset is considered useable before its value is fully depreciated.

Lane-Kilometre – means a kilometre-long segment of roadway that is a single lane in width

Local Roads – means Class 5 and Class 6 highways as determined under the Table to section 1 of Ontario Regulation 239/02

Municipal infrastructure asset - means an infrastructure asset, including a green infrastructure asset, directly owned by a municipality or included on the consolidated financial statements of a municipality, but does not include an infrastructure asset that is managed by a joint municipal water board

Probability of Failure (PofF): The likelihood of an asset reaching functional failure based on realistic forecasts.

Structural Culvert: A culvert which is greater than or equal to 3m in span

Township: The Corporation of the Township of Ramara

List of Acronyms

AMP – Asset Management Plan
BCI – Bridge Condition Index
EAMS – Enterprise Asset Management System
HCB - High-Class Bitumen (asphalt)
LCB – Low-Class Bitumen (tar and chip or “surface treatment”)
NFPA – National Fire Prevention Association
MTO – Ministry of Transportation (Ontario)
PCI – Pavement Condition Index



ROADS

Roads

3.0 State of Infrastructure

The Township of Ramara’s Road Network includes 353 kilometers of roads (earth, gravel, HCB and LCB surfaces), Sidewalks, Paths, Trails and Street lights. As shown in Table 3.1., **the replacement value for this profile is \$147,272,364 making up 90.1% of the overall replacement costs of the Core Asset portfolio.**

3.1 Asset Inventory and Valuation

Table 3.1.: Asset Inventory and Valuation

Road Network Inventory			
Asset Type	Asset Component	Quantity/Units	Replacement Value
Road Network	Earth Roads	8 km	\$800,000*
	Gravel Roads	180 km	\$18,000,000
	HCB Roads (Hot Mix)	116 km	\$116,000,000
	LCB Roads (Surface Treatment)	49 km	\$8,379,000
	Railway Crossings	24	752,664**
	Sidewalks	5 km	\$337,500
	Paths and Trails	9.08 km	\$363,200
	Street Lights	528	\$2,640,000
Total			\$147,272,364

*An Earth road would not be rebuilt as an earth road, the road would be upgraded to a gravel road, however most earth roads are not planned for replacement.

**There are 24 rail crossings within Ramara on Township roads (7 of which are on an abandoned rail line and will most likely be removed). While these crossings are owned by the Canadian National Railway; the Township is responsible for a portion of the expenses for repairs and work to the crossings. The replacement values vary from \$50,000 to \$350,000. The Township currently has costing history for 6 of the 24 crossings and will work with CN to obtain estimates for the crossings to be included in the next update to this Asset Management Plan. Capital Forecasting has been done for the next ten years on the railway crossings for upkeep.

Replacement costs of the roads includes both the surface and the base. Condition assessments for the purpose of this AMP included knowledge of the base of the roads. Although road bases tend to have a much longer useful life than a surface, many of the bases within the Township are in poor condition or are past their useful life and require

replacement when the road surface is replaced. It should be noted that some road bases cannot be reconstructed to an ideal standard due to the land surrounding the roads. Some roads are in swamps and sink over time, others have been built on fallen trees due to the instability of the land. The foundation which these roads are built upon must be considered when establishing proposed and targeted levels of service for Township roads; bringing some roads up to a certain standard is simply not feasible.

3.2 Age and Condition

3.2.1 Age

A summary of the asset age for the Road Network Assets is shown in [Figure 3.2](#). Streetlights, sidewalks, paths and trails are in the middle range of their Estimated Useful Life. The average collector roads age will reach the end of their Estimated Useful Life within the next ten years, where the average local road age exceeds the Estimated Useful Life by 18 years.

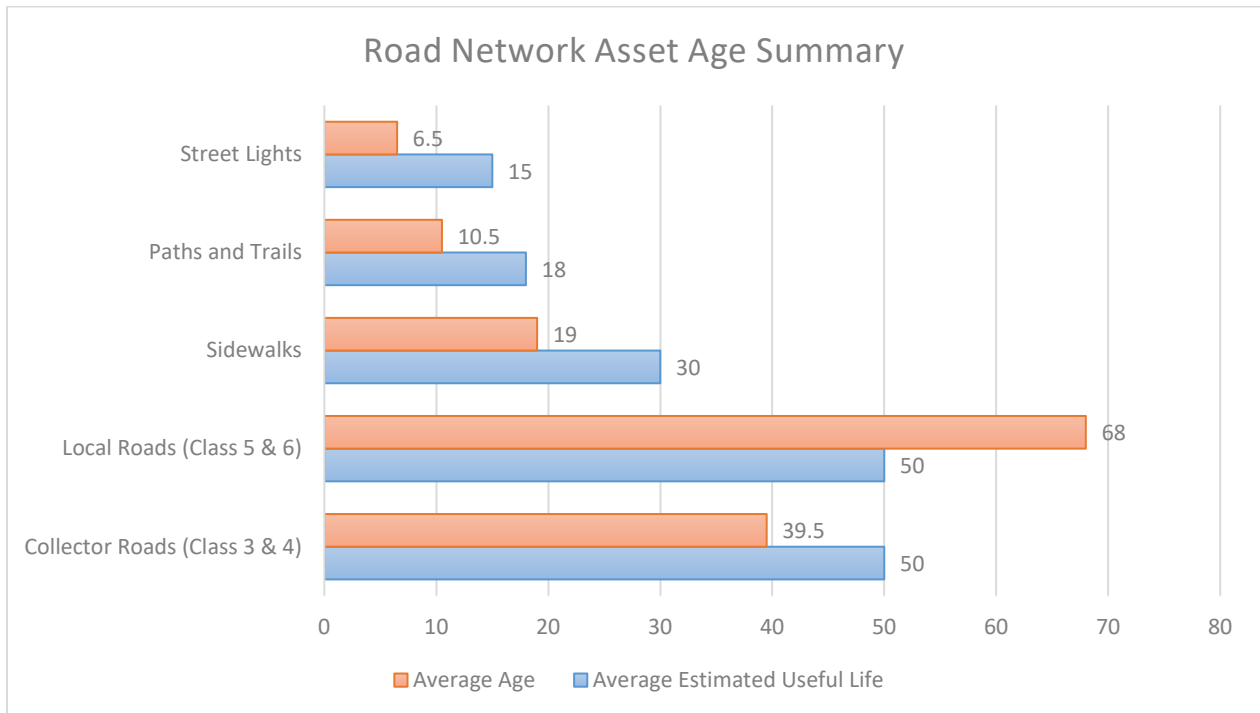


Figure 3.2: Road Network Asset Age Summary

3.2.2 Condition

Figure 3.3 shows the overall condition assessments for the assets within the Road Network

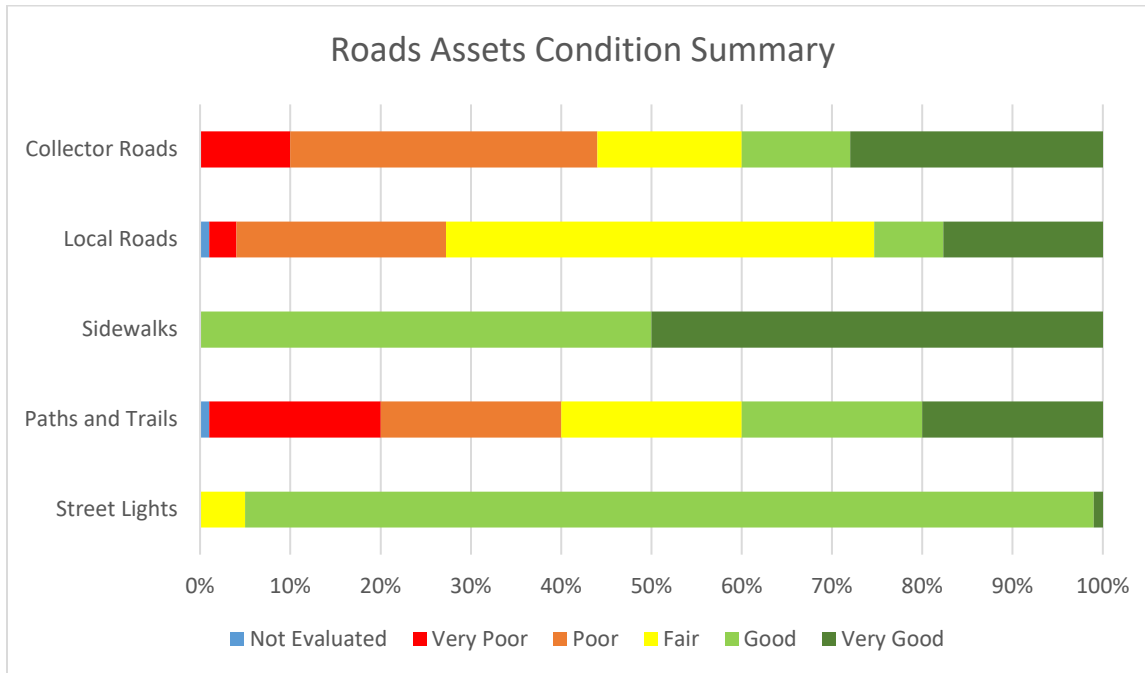


Figure 3.3 Road Network Asset Condition Summary

Roads

Road evaluations show **40% of Collector roads were rated as Good or Very Good**, while **26% of Local roads were graded as Good or Very Good**, with 47% of Local Roads in Fair condition.

The current roads conditions were updated in 2021 using visual evaluations and a scale of 1-5; visually inspecting for crocodile cracking, rutting, segregation, as well as drainage and ditching. Going forward it is recommended that the Township have a Roads Condition Update performed every five years using the Pavement Condition Indexing (PCI) system combined with GPS capabilities. The goal is to achieve a consistent rating system for the hard surface roads within the municipality that can be used as a guide for maintenance and improvement undertakings to achieve the Township's desired Level of Service.

As gravel roads do not have hard surfaces and cannot use the PCI, it is being recommended that the gravel roads in the Township be evaluated in the spring using GPS capabilities to allow for accurate evaluations showing frost boils and soft spots. It is also recommended that the work orders in Citywide be tracked to aid in projected and current condition ratings.

Trails and Paths

Trails and Paths are inspected annually and are in **generally good condition**. Inspections are based mostly on the surface of the trail, looking for disruptions in the surface. The trails are improved by adding gravel/other surface material when necessary and are inspected on an annual basis. The Township has a trails committee that assists staff to construct new trails in the Township. The expansion projects are primarily funded by grants with some municipal portion each year.

Sidewalks

Sidewalks are inspected annually using Citywide Maintenance Manager. The inspector noted any deficiencies as per MMS and cracks across panels. Sidewalk sections were broken into 50 metre segments and given a condition rating based on incidence of cracks or deficiencies. **50% of sidewalks within the Township fall within “Good” criteria and the other 50% within “Very Good”.**

Table 3.4: Sidewalk Condition Evaluation Criteria

Condition	Explanation
Very Good	1-3 minor cracks, no deficiencies
Good	4-7 minor cracks, 1-2 deficiencies
Fair	8-10 minor cracks, 3-5 deficiencies
Poor	More than 10 minor cracks, more than 5 deficiencies
Very Poor	Sidewalk impassable

Streetlights

The Township of Ramara currently inspects the streetlights twice within a 12 month period. Streetlights are also repaired as reported to Township staff. **The streetlights within the Township are in good or very good condition** as the bulbs were replaced in 2013 with LED fixtures. Most streetlights are installed on hydro poles which are not owned by the township. The Township owns 32 concrete streetlight poles in the Crossings and Margaret Orr Subdivisions which have been rated as fair and are currently half way through their Estimated Useful Life.

3.3 Current Levels of Service and Performance

3.3.1 O. Reg 588/17 Required Levels of Service Metrics

O. Reg 588/17 requires legislated community levels of service for core assets. Community levels of service are tracked using both qualitative descriptions and technical metrics based on data from (at most) the two calendar years prior to the year of updating this plan.

Table 3.5: O. Reg 588/17 Required Levels of Service Metrics

Service Attribute	Community Levels of Service Measure	Performance		
Scope	Description, which may include maps, of the road network in the municipality and its level of connectivity.	See Figure 3.6 for a map illustrating the roads within the Township. Ramara is made up of smaller settlements and hamlets, most of which are connected by MTO or County of Simcoe roads with local and collector roads being owned and maintained by the Township.		
Quality	Description or images that illustrate the different levels of road class pavement condition	To demonstrate the scale at which the hard surface roads were reviewed, examples are shown in Table 3.7 .		
Service Attribute	Technical Levels of Service Measure	Performance		
Scope	Number of lane-kilometres of each arterial, collector and local roads as a proportion of square kilometres of lane area in the municipality.	Road Classification	Lane-kilometer	Township Land Area (km ²)
		Collector	164.4	418.82
		Local	558.16	
		<i>The Township does not maintain or own any arterial roads.</i>		
Quality	<ol style="list-style-type: none"> For paved roads in the municipality, the average pavement condition index value. For unpaved roads in the municipality, the average surface condition (e.g. excellent, good, fair or poor). 	<ol style="list-style-type: none"> The current road conditions have been updated with visual evaluations. See explanation in 3.2.2. The average condition of the Gravel Surface roads is rated Fair (2.35/5) 		

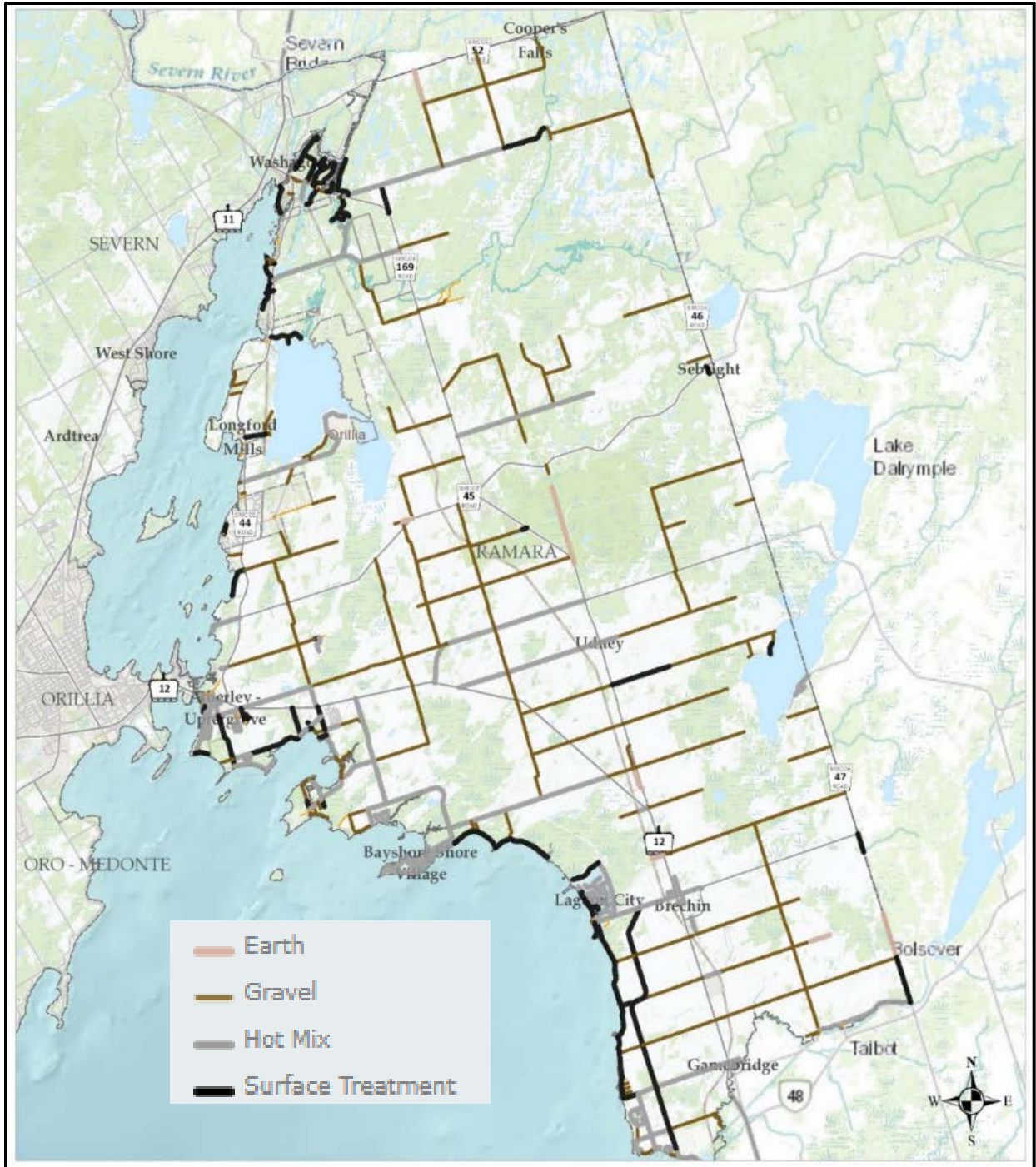


Figure 3.6: Ramara Roads by Surface Type

Table 3.7: Levels of Road Class Pavement Condition

Condition	Pictures to demonstrate condition
<p>Very Good Condition</p> <p>Smooth surface with appropriate crowning and ditching/storm water management. No signs of surface wear or cracking</p>	
<p>Good Condition</p> <p>Slight wearing of the surface. Some minor cracking</p>	
<p>Fair Condition</p> <p>Cracks and stress evident on road. Some crocodile cracking beginning to form.</p>	
<p>Poor Condition</p> <p>Crocodile cracking established and beginning to spread</p>	
<p>Very Poor Condition</p> <p>Crocodile Cracking covers most of the surface, hard surface is starting to break off resulting in numerous potholes</p>	

3.3.2 Municipal Performance Evaluations:

Overall Road Conditions and Length

The pie chart below shows the overall road condition rating by length of road segment and its condition. 36% of all the kilometers of roads in the Township (regardless of class or surface type) are currently rated as “poor” or “very poor”.

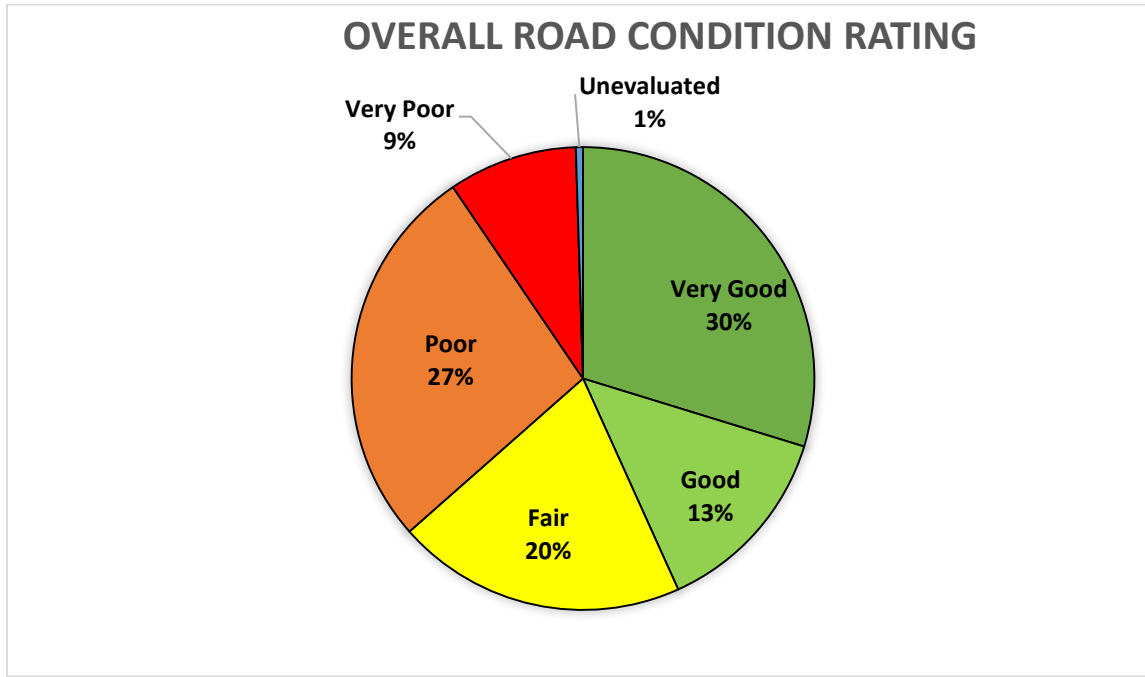


Figure 3.8: Overall Road Condition by Length

Cost efficiency

The Township will track the estimated operating cost per property in each Asset Management Plan update. The operating cost will be based on the average operating cost over the most recent two years divided by the number of properties. As of the writing of this plan there are 7695 properties in the Township. Properties owned by lower and upper tier governments have been removed from this number.

Average Operating Costs 2020 & 2021	Properties	Cost per Property
\$4,222,608.50	7695	\$548.75

Operational

In 2021 the Township began to implement the use of Citywide Maintenance Manager to track service requests, work orders and route patrol. It is being recommended that the Township incorporate the Minimum Maintenance Statistics into their performance evaluations in the future.

Environmental Stewardship

In 2017, the Township converted street lights to LED lighting. The Township will only install LED streetlights. The Township of Ramara utilizes a program to reuse the sand used for winter control. The sand collected from the street sweepers in the spring is screened and reclaimed and reused the following year to divert it from the landfill. The Township is encouraged to continue this program. The Township intends to continue this program and expand in the future whenever possible as the Township embraces “green” initiatives.

3.4 Asset Management Strategy

Life Cycle Activities

The set of planned actions that will enable the assets to provide the levels of service in a sustainable way, while managing risk, at the lowest lifecycle cost (e.g. through preventative action).

LCB Roads:

Condition or Age	Action	Cost/km	Added Useful Life	Action Type
1 year old	Slurry Seal	\$19,698	5 Years	Renewal/rehab
Condition 3.5-3	Slurry Seal	\$19,698	7 years	Renewal/rehab
Condition 4.5-5	Pulverize and surface	\$171,000	-	Disposal/replace
As Needed	Crack seal/cold patch/spray patch		-	Maintenance

HCB Roads:

Condition or Age	Action	Cost per unit	Added Useful Life	Action Type
Condition 3-3.5	Route and seal	\$30 per metre	5 years	Preventative Maintenance
Condition 3.5-4.5	Slurry Seal	\$19,698/km	5 years	Renewal/rehab
Condition 4.5-5	Replace Surface	\$1,000,000/km	-	Disposal
As Needed	Crack seal/cold patch/spray patch		-	Maintenance

When roads are replaced, the Township investigates ways to incorporate active recreation trails where possible to expand our trail system and increase road/pedestrian safety. During the replacement projects, culverts are rehabilitated and reused where ever possible for cost reduction and environmental responsibility. Stormwater Management infrastructure is installed if necessary.

Gravel is added to trails on an as needed basis to fill pot holes and low spots. Grass is cut once per month and tree brushing is done every 3-5 years.

3.5 Financing Strategy

The monetary requirements for the next 10 years are outlined below for capital works for the Township Road Network. **Within the next 10 years, the Township should plan for \$43,234,348.00 in capital investments.** The estimations for roads and railway crossings is based off the Capital Forecasting done by the Township. The estimations for Sidewalks, Streetlights and Paths and Trails are based off historical costs, estimated useful life of the assets and condition. The values below show the financial commitment required to maintain the current level of service in these assets.

Table 3.9: 10 Year Capital Planning for Road Network Assets

Year	Roads	Sidewalks	Railway Crossings	Paths and Trails	Streetlights	Total Per Year
2022	\$7,723,689	\$3,000	\$510,000	\$40,000	\$10,000	\$8,286,689
2023	\$9,148,974	\$3,000	\$970,000	\$40,000	\$10,000	\$10,171,974
2024	\$4,587,051	\$3,000	\$170,000	\$40,000	\$10,000	\$4,810,051
2025	\$2,327,632	\$3,000	\$70,000	\$40,000	\$10,000	\$2,450,632
2026	\$2,457,299	\$3,000	\$50,000	\$40,000	\$10,000	\$2,560,299
2027	\$2,445,767	\$3,000	\$440,000	\$40,000	\$10,000	\$2,938,767
2028	\$2,941,058	\$3,000	\$50,000	\$40,000	\$10,000	\$3,044,058
2029	\$2,533,886	\$3,000	\$50,000	\$40,000	\$10,000	\$2,636,886
2030	\$3,159,336	\$3,000	\$90,000	\$40,000	\$10,000	\$3,302,336
2031	\$1,798,611	\$3,000	\$45,000	\$40,000	\$10,000	\$1,896,611
2032	\$1,083,345	\$3,000	0	\$40,000	\$10,000	\$1,136,345

The Citywide Replacement Profile Report displays the financial requirement to maintain the current level of service. These activities are based on the condition assessments and projected conditions of the assets. Since the visual inspections for the roads are subjective and not an ideal method to assessing true condition, it is recommended in the next study that this report be used to estimate the costs required for maintaining the current level of service using the PCI as an indicator of condition.

The Infrastructure Deficit is outlined on page 40.



BRIDGES AND CULVERTS

Bridges and Structural Culverts

4.0 State of Infrastructure

The Township of Ramara’s Bridge Network includes 19 road bridges, 2 foot bridges and 5 structural culverts. As shown in [Table 4.1](#), **the replacement value for this profile is \$12,397,500.00, making up 7.6% of the Core Asset Portfolio.**

4.1 Asset Inventory and Valuation

Table 4.1: Bridge and Structural Culvert Inventory

Bridges and Structural Culverts (over 3m)			
Asset Type	Component	Quantity/Units	Replacement Value
Bridges and Structural Culverts	Bridges	232.48m/19 bridges	\$10,000,000
	Structural Culverts	5	\$1,900,000
	Pedestrian Footbridges	79.36m ² /2 footbridges	\$497,500
Total			\$12,397,500

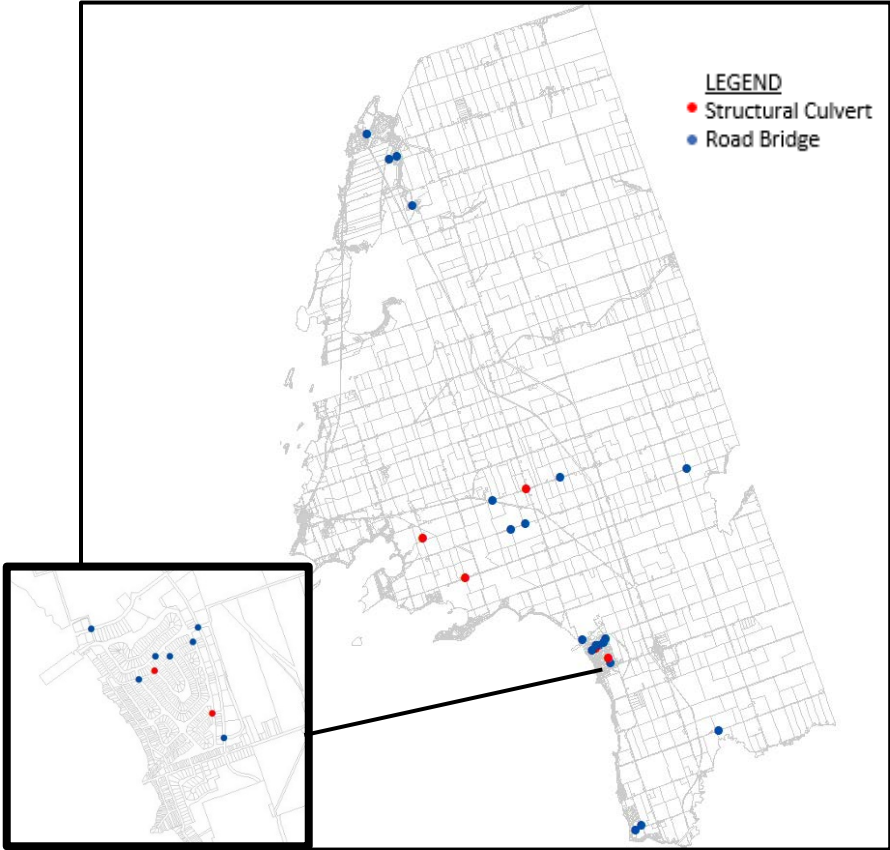


Figure 4.2 Ramara Bridges and Structural Culvert Locations
Ramara Township Core Asset Management Plan March 2020

4.2 Asset Age & Condition

4.2.1 Age

A summary of the asset age for the Bridge Network Assets is shown in Figure 4.3. The footbridges in Lagoon City are early in their estimated useful life, while the structural culverts and road bridges on average have exceeded their Estimated Useful Life. The current bridge inventory in Ramara are older bridges, in Lagoon City for example most bridges are made with timber. As bridges are replaced, the new Estimated Useful Life should be 75 years instead of the current 40-50 year lifespan.

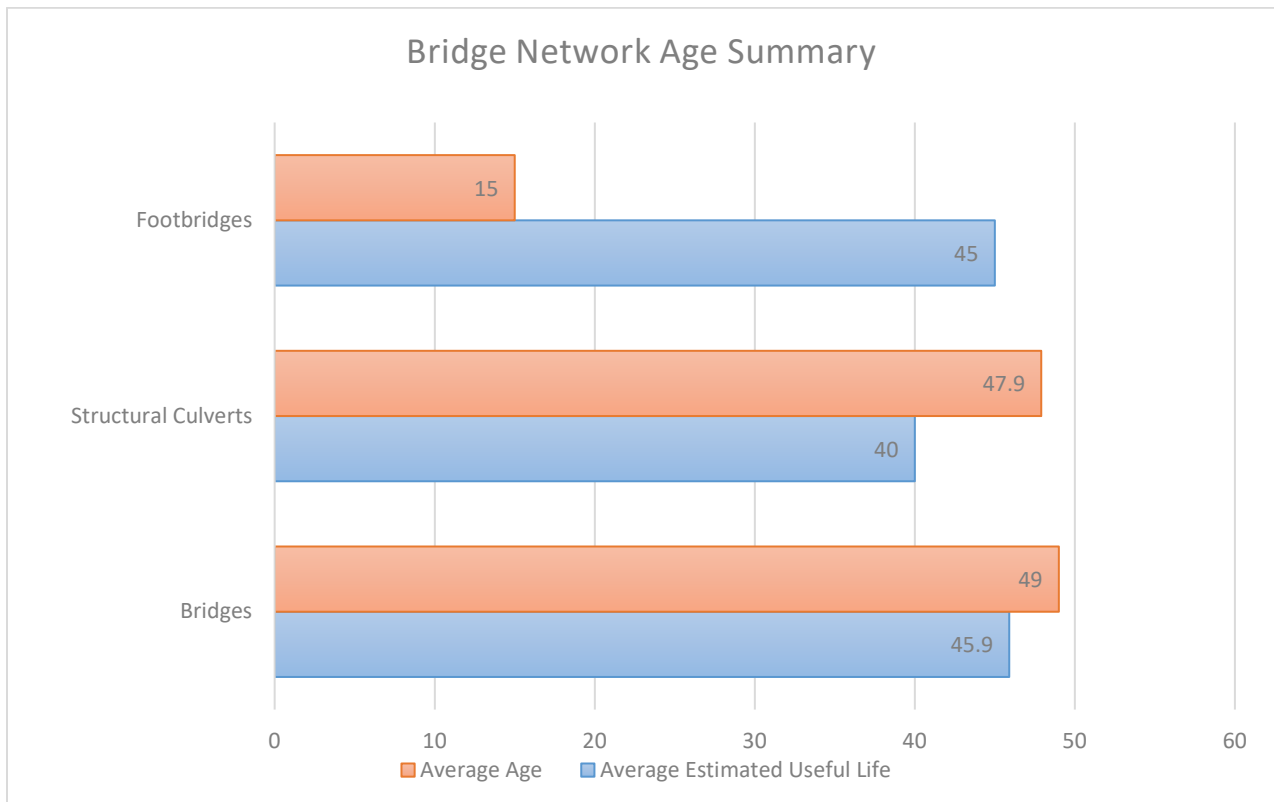


Figure 4.3: Bridge Network Age Summary

4.2.2 Condition

The biannual bridge study was performed in 2021 by EXP. **21% of the bridges were rated as Good** Overall condition and **42% Poor**. The study identified two bridges needing immediate service; Bridges 2 and 4 are in need of repair of timber piles. There were rehabilitation recommendations on curbs and wing walls within 5 years on several others.

There are two bridges (Bridges 13 & 14) on unopened road allowances, both rated as very poor. They are not planned for replacement.

60% of the structural culverts were all rated as Good overall condition with an average BCI of 74.5. Three of the five culverts had limited access due to high water and distance. It is recommended in the report that closer inspections be done on these culverts during the 2023 study.

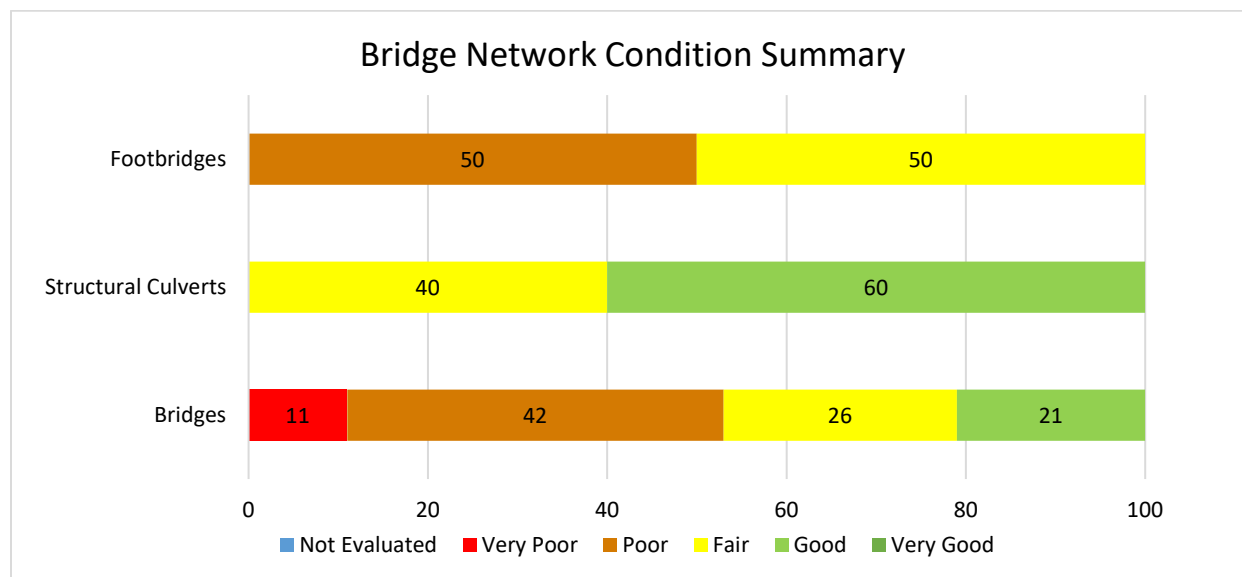


Figure 4.4: Bridge Network Asset Condition Summary (values in percentage of overall asset type)

The condition ratings are based on the MTO guidelines outlined in Table 4.6. As a result of these MTO guidelines, the Township ratings for the bridges are outlined below:

Table 4.5: Township of Ramara Bridge Rating Criteria

Rating	BCI range
Very Good	90 and above
Good	75 to 89
Fair	70 to 74
Poor	40 to 69
Very Poor	39 and Below

Table 4.6: Bridge Condition Index as Outlined by the Ministry of Transportation (MTO)

Rating	Maintenance schedule
BCI Range 70 -100	Maintenance is not usually required within the next five years
	Maintenance work is usually scheduled within the next five years. This is the ideal time to schedule major bridge repairs to get the most out of bridge spending.
BCI Range 60 -70	Maintenance work is usually scheduled within one year.

4.3 Current Levels of Service and Performance

4.3.1 O. Reg 588/17 Required Levels of Service Metrics

O. Reg 588/17 requires legislated community levels of service for core assets. Community levels of service are tracked using both qualitative descriptions and technical metrics based on data from (at most) the two calendar years prior to the year of updating this plan.

Table 4.7: O. Reg 588/17 Required Levels of Service Metrics

Service Attribute	Community Levels of Service	Performance
Scope	Description of the traffic that is supported by municipal bridges (e.g., heavy transport vehicles, motor vehicles, emergency vehicles, pedestrians, cyclists).	The Township of Ramara's bridges have been designed in accordance with the requirements of the Bridge Design Code at the time of construction. The bridges have been designed to carry transport trucks, motor vehicles, emergency vehicles, pedestrians and cyclists.
Quality	<ol style="list-style-type: none"> 1. Description of images of the condition of bridges and how this would affect use of bridges. 2. Description or images of the condition of the culverts and how this would affect use of the culverts. 	<ol style="list-style-type: none"> 1. Images included in Table 4.8 2. Images included in Table 4.9
Service Attribute	Technical Levels of Service	Performance
Scope	Percentage of Bridges in the municipality with loading or dimensional restriction	16.6% (There are four bridges with lane restrictions, none with load restrictions).
Quality	<ol style="list-style-type: none"> 1. For bridges in the municipality, the average bridge condition index value 2. For structural culverts in the municipality, the average bridge condition index value. 	<ol style="list-style-type: none"> 1. The average BCI for bridges is 63 (the two bridges not scheduled for replacement have not been included in this value) 2. The average BCI for culverts is 68

Table 4.8: Description and Images of Bridge Condition











Condition	Images of the condition of bridges
<p>Very Good Condition</p> <p>No repairs needed</p>	
<p>Good Condition</p> <p>Minor Rehab within 1-5 years. (example, deck repairs)</p>	
<p>Fair Condition</p> <p>Wearing surface over joint seal and approach slab</p> <p>Rehabilitation or Replacement required within 6-10 years</p>	
<p>Poor Condition</p> <p>Concrete loss and exposed rebar on wingwalls. Poor condition timber deck</p> <p>Rehabilitation or Replacements within 1-5 years</p>	
<p>Very Poor</p> <p>Decayed and crushed timber piles</p> <p>Rehabilitation or Replacement required immediately</p>	

Table 4.9: Description and Images of Culvert Condition

Condition	Description
<p>Very Good</p> <p>No repairs needed</p>	
<p>Good</p> <p>Minor repairs or service such as tightening or replacement of bolts</p>	
<p>Fair</p> <p>Acceptable condition and components generally functioning as intended</p> <p>Minor rehabilitation may be required within 6-10 years</p>	
<p>Poor</p> <p>Presence of distresses or significant deterioration with components</p> <p>Rehabilitation or replacement required within 1-5 years</p>	
<p>Very Poor</p> <p>Structural Integrity compromised. Immediate repair required</p>	

4.3.2 Municipal Performance Evaluations:

Operational

Figure 4.10 shows the percentage of bridges that have a BCI between 60 and 64. These bridges are more likely to have rehabilitations/repairs **within the next 5 years and require short term planning**. Conversely, the percentage of bridges with a BCI over 70 is also being highlighted as these bridges are generally in good repair with maintenance not usually required within the next 5 years.

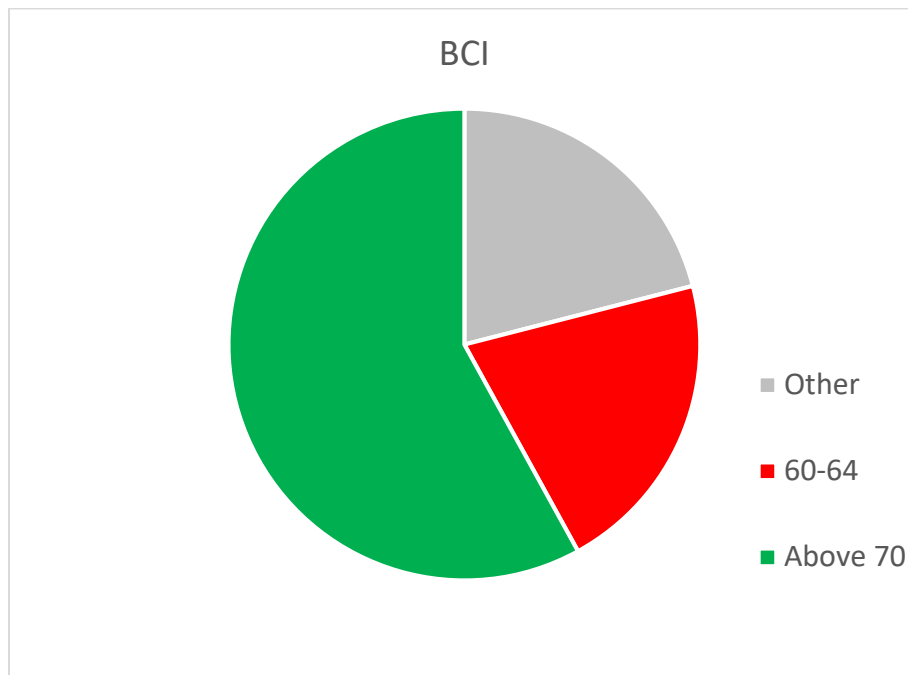


Figure 4.10 Bridge Condition Performance Measures

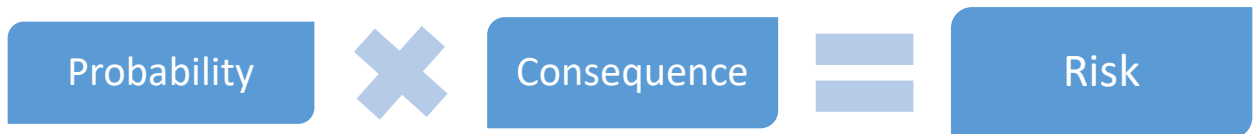
4.4 Asset Management Strategy

Life Cycle Activities

The Township undertakes a Biannual Bridge inspection on the bridges and structural culverts within the municipality. This report provides an up to date condition assessment of the bridges using the Bridge Condition Index and provides recommended activities for repair, rehabilitation and replacement of the structures. It is suggested that the Township continue this process; schedule and prioritize the recommended lifecycle activities as directed in the study. Using Citywide, the Township can use the risk matrix to prioritize initiatives while planning for the financial implications over the long term.

Risk

A weighted risk matrix for the bridges and structural culverts has been established to assist in supporting replacement and rehabilitation projects. Assets with a higher risk should be prioritized in capital planning. The overall Risk is calculated as a product of Probability and Consequence.



The Probability of Failure is based on the Condition of the bridge based on the BCI. As the condition of the asset deteriorates, the probability of failure increases.

The Consequence of Failure is weighted based on the following metric:

- 60% Replacement Cost – the higher the replacement cost the higher the consequence
- 25% Annual Average Daily Traffic (AADT) – the AADT of the road the bridge/culvert is on increases the consequence of failure
- 15% Alternate Route – Bridges/culverts that do not have alternate routes need to be prioritized

Risk Matrix for Structural Culverts and Bridges

		1	2	3	4	5
5	0 Assets - \$0.00	0 Assets - \$0.00	0 Assets - \$0.00	0 Assets - \$0.00	0 Assets - \$0.00	0 Assets - \$0.00
4	0 Assets - \$0.00	0 Assets - \$0.00	1 Asset 18.60 m \$600,000.00	0 Assets - \$0.00	0 Assets - \$0.00	0 Assets - \$0.00
3	0 Assets - \$0.00	0 Assets - \$0.00	4 Assets 71.40 m \$2,400,000.00	5 Assets 85.90 m \$2,800,000.00	0 Assets - \$0.00	0 Assets - \$0.00
2	0 Assets - \$0.00	0 Assets - \$0.00	8 Assets 97.78 m \$4,500,000.00	3 Assets 25.00 m \$2,100,000.00	0 Assets - \$0.00	0 Assets - \$0.00
1	0 Assets - \$0.00	0 Assets - \$0.00	1 Asset 3.40 m \$100,000.00	0 Assets - \$0.00	0 Assets - \$0.00	0 Assets - \$0.00
		1	2	3	4	5
		Probability				

4.5 Financing Strategy

The monetary requirements for the next 10 years are outlined below for capital works on the Bridges and Structural Culverts. **Within the next 10 years, the Township should plan for \$3,891,170.00 in capital investments.** This is based off the 2021 Biannual Bridge Study and the Capital Forecasting done by the Township.

Timeframe	Cost	Notes
Within 5 years	\$2,470,780	This includes 2 major capital improvements in 2022 at \$250,000.00 each; a bridge replacement in 2023 at \$1.1 million and a structural culvert replacement in 2025 at \$300,000.00.
Within 6-10 years	\$1,420,390	This includes a structural culvert replacement in 2030 at \$800,000.00

The [Infrastructure Deficit](#) is outlined on page 40.



TOWNSHIP OF
RAMARA



Photos provided by Ramara Air One pilot Jim Watson

STORMWATER MANAGEMENT

Storm Water Management

5.0 State of Infrastructure

The Township of Ramara’s Storm Water Management Network includes 338 metres of storm sewer, 24 catch basins, manholes and ditch inlets, as well as 5 storm water management ponds and 41 Lake Outlets. Most of the Township’s storm water management infrastructure requires regular clean out and inspection with very little repair. **The replacement value of this profile is \$3,728,500 making up 2.3% of the overall replacement costs of the Core Asset portfolio.**

5.1 Asset Inventory and Valuation

Table 5.1: Storm Water Management Inventory

Storm water Management Inventory			
Asset Type	Asset Component	Quantity/Units	Replacement Value
Storm Water Management	Catch Basins	10	\$90,000
	Manholes	8	\$72,000
	Ditch Inlets	6	\$87,000
	Storm Sewer (linear)	521	\$724,500
	Storm Water Management Ponds (SWM Ponds)	5	\$2,500,000
	Stormceptors	2	\$50,000
	Lake Outlets	41	\$205,000
Total			\$3,728,500

The replacement costs for the assets above are based on recent installs for some of the basins, inlets and manholes. Other replacement costs are based on quotes found from surrounding municipalities.

The municipality also utilizes municipal drains and open ditches that help with water drainage. These assets will to be included in green infrastructure in later AMPs.

5.2 Age and Condition

5.2.1 Age

A summary of the asset age for the SWM Network is shown below. Most of the storm water management assets are early in their Estimated Useful Life. The average SWM pond is 16 years old, and most manholes, catch basins and ditch inlets have been installed within the last 12 years.

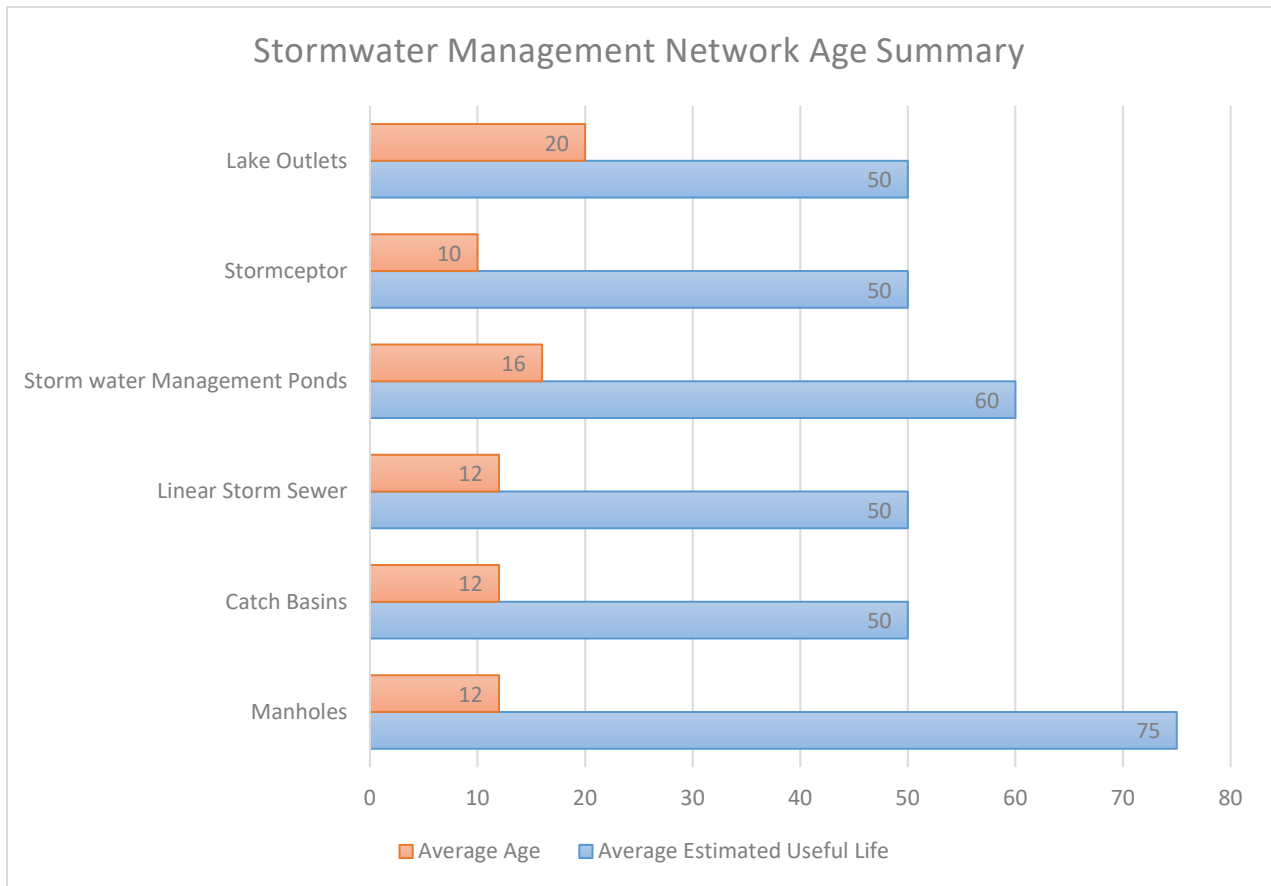


Figure 5.2 Stormwater Management Network Age Summary

5.2.2 Condition

Figure 5.3 shows the overall condition assessment of the assets within the Storm Water Management Network.

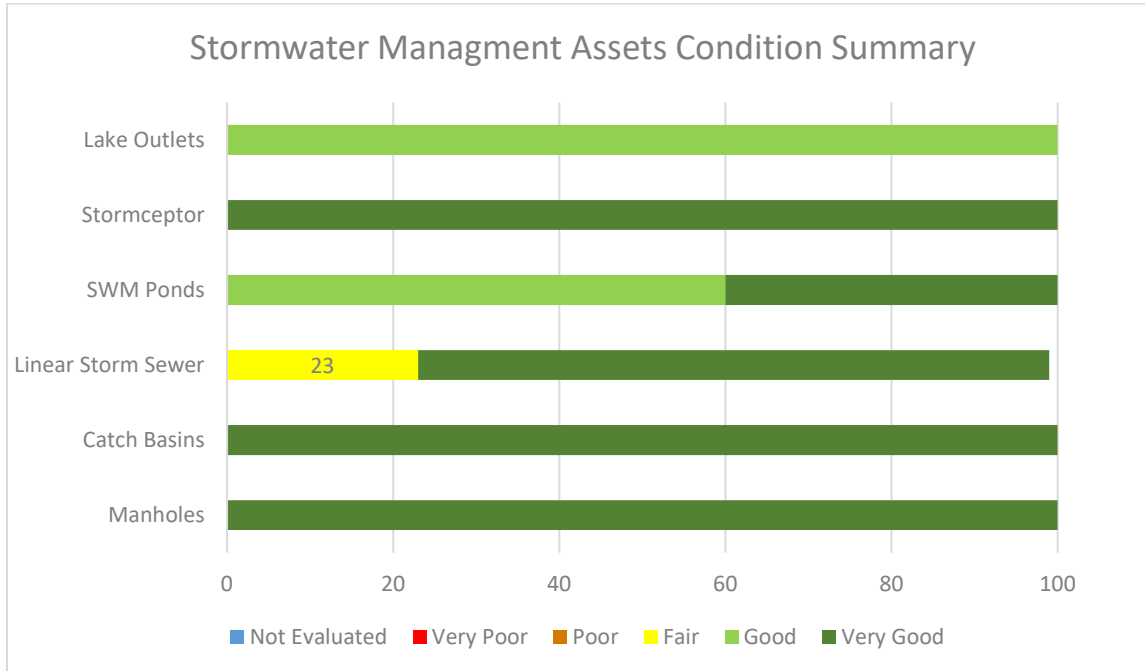


Figure 5.3 – Stormwater Management Condition

The Condition assessments are based on annual or biannual inspections during maintenance and clean out procedures. Most of the Township's Stormwater Management Infrastructure is fairly young in age and is **in Good or Very Good Condition**. Any impairments on functionality are noted and the maintenance and/or rehabilitation are scheduled and completed accordingly. There has been some drainage impairment noted in the Brechin area during heavy rain fall, this section is in fair condition.

Stormwater Management Ponds

Inspections of the Stormwater Management Ponds occur annually. The inspection consists of 8 components to inspection. The overall condition rating of the ponds is based on the following criteria:

Condition	Justification
Very Good	Mostly “not a problem”. No more than 2 components needing “monitoring”
Good	50% or more “not a problem”. No immediate servicing required.
Fair	50% needing routine maintenance
Poor	Up to 50% needing immediate repair
Very Poor	More than 50% needing immediate repair

Notes and Assumptions

Data considering the age, size, material and specifications of some of the stormwater management infrastructure is incomplete in the Township’s EAMS. It is recommended that this information be captured and recorded when possible.

New capital stormwater management undertakings are included in road reconstruction projects where possible. New developments are required to follow stormwater master plans where applicable.

5.3 Current Levels of Service and Performance

5.3.1 O. Reg 588/17 Requirements

O. Reg 588/17 requires legislated community levels of service for core assets. Community levels of service are tracked using both qualitative descriptions and technical metrics based on data from (at most) the two calendar years prior to the year of updating this plan.

Table 5.4: O. Reg 588/17 Required Levels of Service Metrics

Service Attribute	Community Levels of Service	Performance
Scope	Description, which may include maps, of the user groups or areas of the municipality that are protected from flooding, including the extent of the protection provided by the municipal stormwater management system	As shown in Figure 5.5 small areas in each Brechin and Atherley are currently protected with a Township owned linear storm water management system. There are also Storm water Management Ponds in Crossings Subdivision (2), Margaret Orr Subdivision, the McNabb Drain (2)/Industrial Park area.
Service Attribute	Technical Levels of Service	Performance
Scope	<ol style="list-style-type: none"> 1. Percentage of properties that are resilient to a 100-year storm 2. Percentage of the municipal stormwater management system resilient to a 5-year storm 	<ol style="list-style-type: none"> 1. 53% of properties within Ramara are resilient to a 100-year storm. <ul style="list-style-type: none"> - Figure 5.6 shows the flood mapping and shoreline hazard mapping for Lake Simcoe. - Figure 5.7 shows the floodplain mapping for the Black River Watershed 2. 100% of Ramara's stormwater management systems are resilient to a 5-year storm.

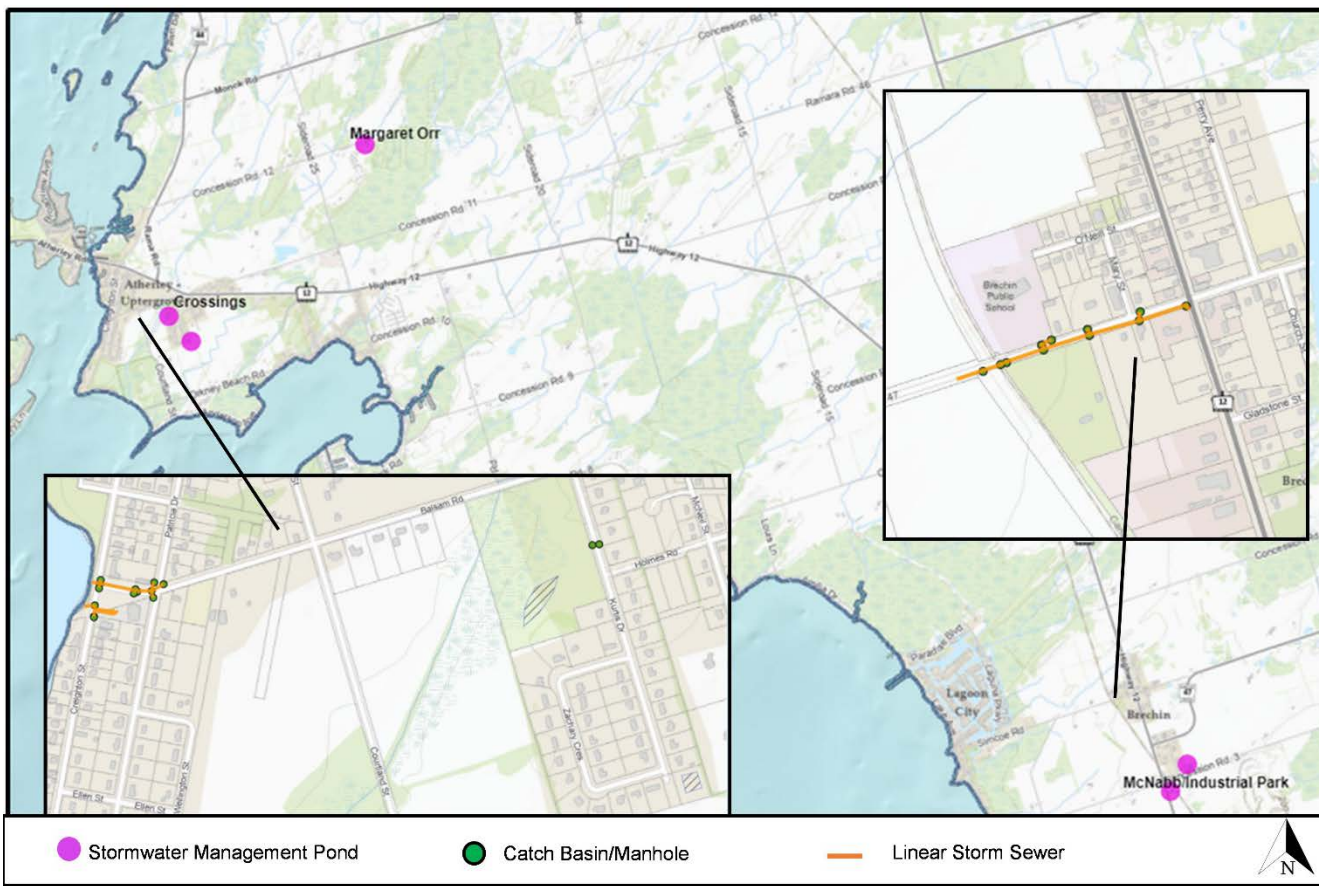


Figure 5.5 Map of Stormwater Management Infrastructure

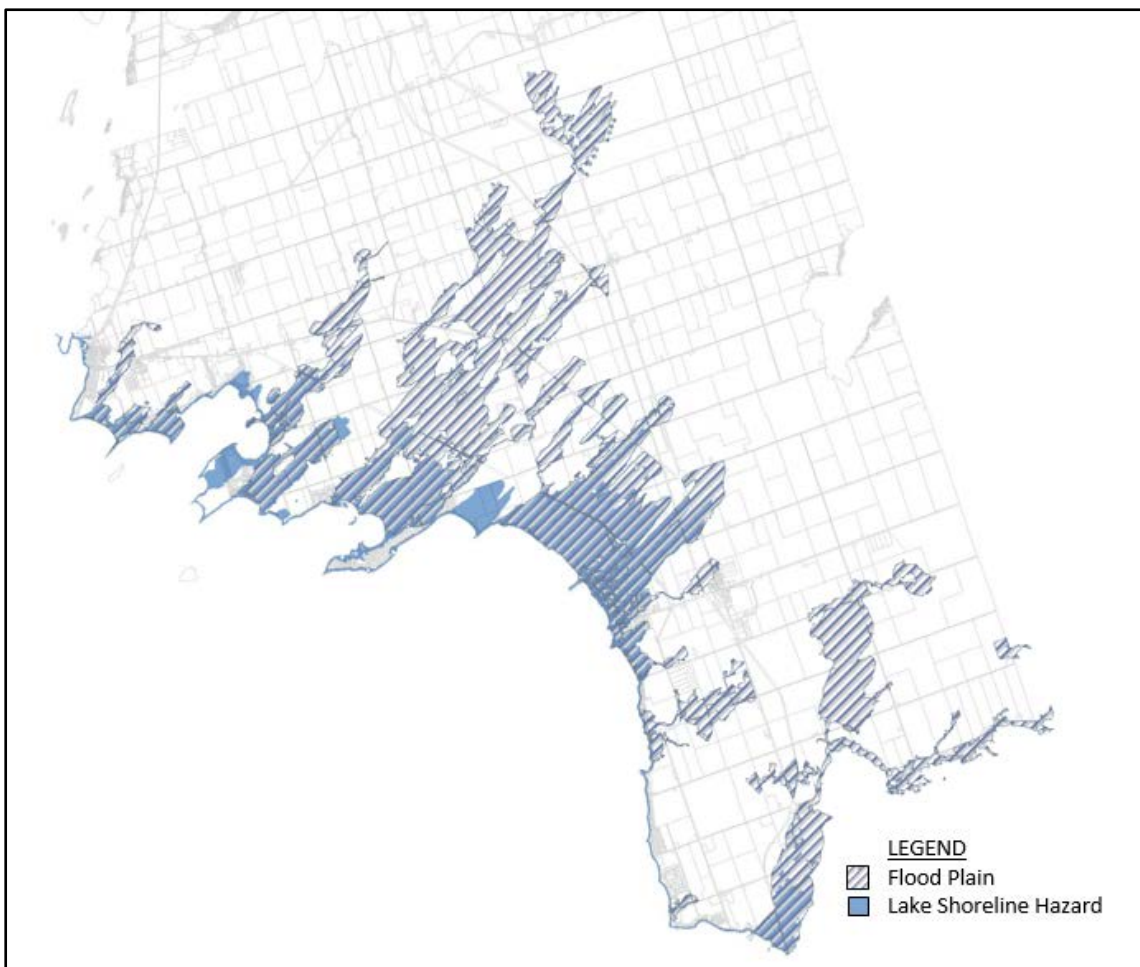


Figure 5.6 LSRCA Flood Plain and Lake Shoreline Hazard Mapping, © LAKE SIMCOE REGION CONSERVATION AUTHORITY, 2021. All Rights Reserved

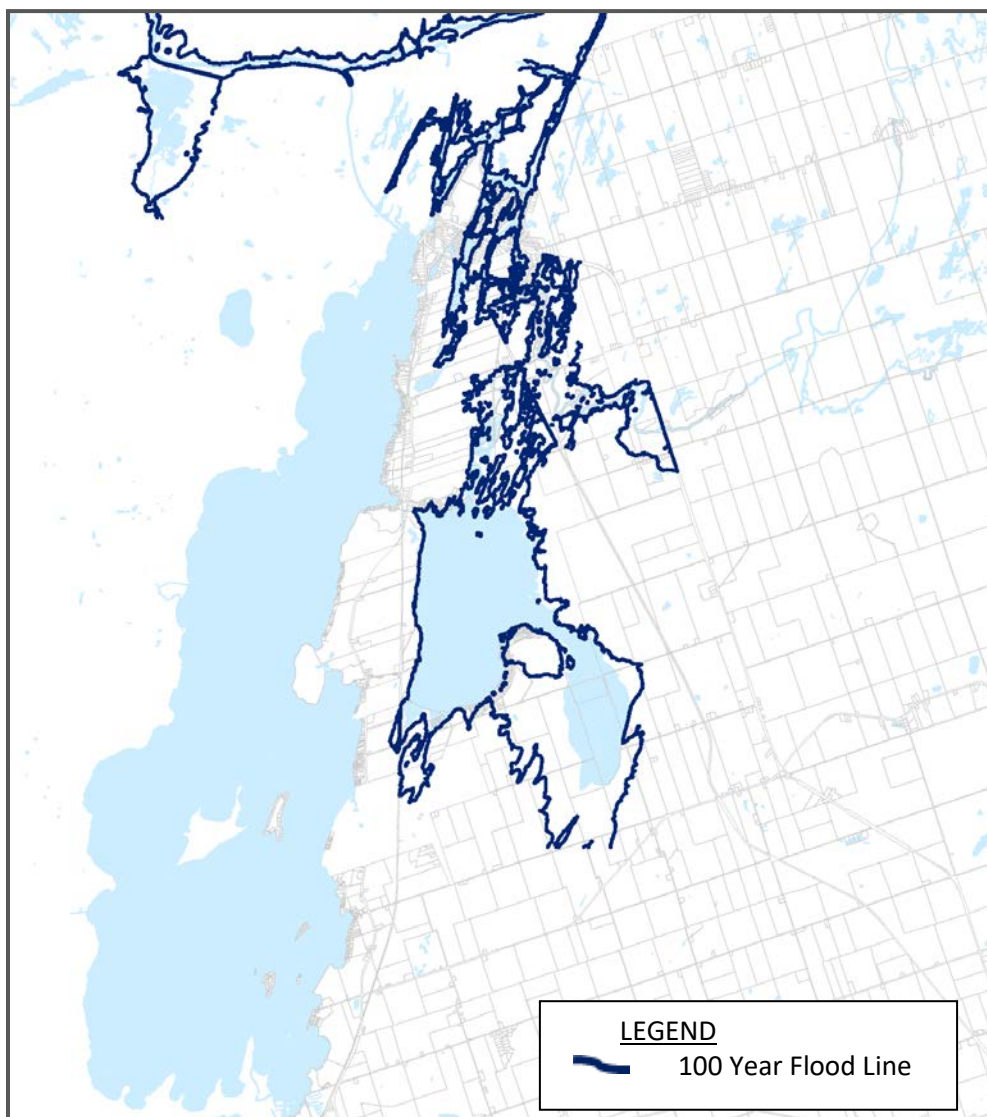


Figure 5.7: MNR 100 Year Floor Line Mapping for Black River Watershed, 2008

The MNR 100 year flood line and LSRCA floodplain and shoreline hazard mapping were reviewed and indicate within the Township of Ramara 53% of properties would be resilient to a 100 flooding event.

It is estimated that 804 properties along the Black River Flood Plain are susceptible to flooding, and 2739 properties within the Lake Simcoe Watershed are susceptible to flooding, all of which do not benefit from municipal storm water management.

Properties within the LSRCA floodplain require a permit for construction/renovation in which the LSRCA may require flood mitigation tactics in construction.

Properties within the floodplain of the Black River may be subject to site plan approval which may require flood prevention tactics for construction.

5.3.2 Municipal Performance Evaluations

The maintenance of the Stormwater Management Infrastructure to date is very proactive. Issues are identified and rectified annually in a constructive manner.

Operational

Through Citywide Maintenance Manager it is recommended that the Township track both quantitatively and geospatially when roads are flooded. This will allow the Township to direct future expansions for Stormwater Management as well as identify areas of need quickly.

Environmental Stewardship

The Township should strive to implement Low Impact Development (LID) wherever possible in new developments and replacement going forward.

5.4 Asset Management Strategy

Life Cycle Activities

Outlets

Outlets are cleaned and inspected twice annually through permit with the Lake Simcoe Region Conservation Authority. Any needs for service or repair are noted during the clean out and scheduled accordingly.

Stormceptor

The Stormceptors are located at the main Administration Building at 2297 Highway 12 and Fire Station One, 2115 Highway 12. They are cleaned out annually and inspected to ensure proper functionality.

Stormwater Management Ponds

The Stormwater Management Ponds are inspected annually by staff in accordance with the requirements of the Ministry of Environment. Repair and rehabilitation tasks are to be scheduled accordingly to ensure the ponds are operating as intended in their Certificate of Approval.

Manholes, Catch Basins, Linear Storm Sewers and Ditch Inlets

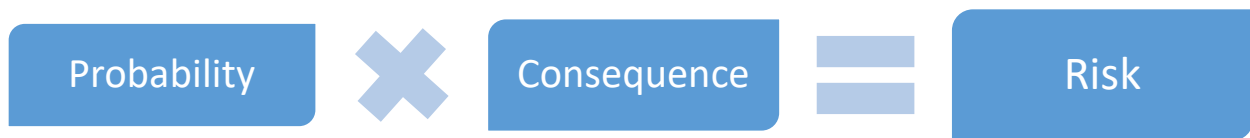
These assets are cleaned out on an as needed basis. Maintenance and repair inspections are done bi-annually or more as needed. If the assets begin to under perform they are inspected and repair and rehabilitation activities are scheduled

accordingly. If these assets are associated with a Stormwater Management Pond they are inspected annually with the Stormwater Management Ponds.

Risk

If failure occurs in the Stormwater Management infrastructure there is a risk of damage to public and private property as well as a negative impact on waterways within the municipality. Regular inspections and evaluations of the efficacy of the storm water management assets need to continue to recognize potential and impending failure.

With recent weather patterns, the 100 year storms are more prevalent and as such all new Stormwater Management initiatives should be done in consultation with Township Engineering Consultants to ensure there is sufficient ability to handle the increasingly severe weather. The Township either has established or is in the process of establishing Storm Water Management Plans for its main settlement areas. Issues such as climate change and development intensification are taken into consideration in these plans and future development is to follow the plans and policies.



Probability of failure is based on age and condition. Where consequence is based on replacement value. In most cases the assets in this profile land low on the risk matrix. The Stormwater Management Ponds hold a more severe consequence due to the number of households served, ministry requirements and replacement costs.

5.5 Financing Strategy

Annual Requirement	Stormwater Linear/ Stormwater Management Ponds*	Basins/Manholes	Outlets	Total Per Year
Each year	\$110,000	\$30,000	\$40,000	\$180,000

*The maintenance/rehab of stormwater, bridge and culvert are all lumped together in one line in budget. For the purposes of this plan the budget amount has been placed under storm as the bridge/culvert capital expenditures are outlined under Bridges/Culverts

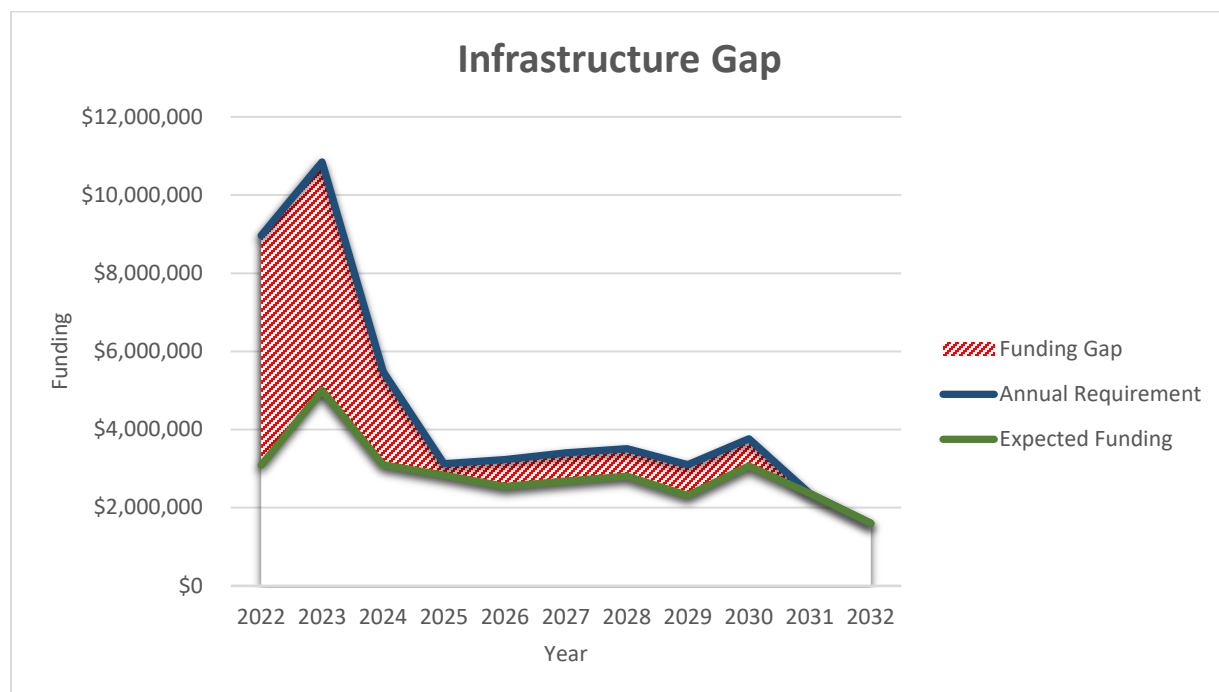
The [Infrastructure Deficit](#) is outlined on page 40.

Infrastructure Deficit

Table I-1 outlines the Annual Requirement per year over a ten year period to perform the Capital Activities required to maintain the Current Level of Service in the Township in comparison to what is expected to be allocated from the tax base. **The Deficit shows the annual infrastructure gap for the needs of the assets within the Core Portfolio of an average \$2,908,265 per year.**

Table I-1: The Infrastructure Gap

Year	Total Per Year	Expected Funding	Deficit
2022	\$8,960,845	\$3,086,031	\$(4,110,468)
2023	\$10,846,130	\$5,003,247	\$(5,842,882)
2024	\$5,484,207	\$3,103,774	\$(2,380,432)
2025	\$3,124,788	\$2,829,309	\$(295,478)
2026	\$3,234,455	\$2,544,558	\$(689,897)
2027	\$3,402,845	\$2,685,437	\$(717,407)
2028	\$3,508,136	\$2,803,285	\$(704,853)
2029	\$3,100,964	\$2,318,415	\$(782,549)
2030	\$3,766,414	\$3,064,936	\$(701,478)
2031	\$2,360,689	\$2,360,689	-
2032	\$1,600,423	\$1,600,423	-



The Township intends to address the funding gap as follows:

- The funding gap and 10 year capital plan is reviewed annually through the budget process
- Projects will be reviewed on an annual basis and may get moved based on funding availability and reserve health. **Asset health and risk** will also be taken into consideration when delaying capital projects
- The average funding gap over the next 10 years will be \$2,908,265
- The funding gap is the difference between expected taxes to be raised and expected funding required to maintain current infrastructure
- While there is a substantial funding gap over the next 10 years, it is expected to be covered through grants, reserves, and user charges.
- All infrastructure capital related to growth will be covered by development charges

Population

According to the Development Charges Background Study from 2020 prepared by Hemson Consulting Ltd. Ramara’s residential forecast shows that the number of dwelling units will increase by 803 between 2020 and 2029, with an accompanying population increase in new units for 1,944.

Summary of Development Forecast

RESIDENTIAL FORECAST	Existing	2020 - 2029	
	2019	Forecast Change	As at Mid Year-2029
Occupied Households	4,230	803	5,033
Population			
Census	9,954	1,890	11,844
In New Households		1,944	
NON-RESIDENTIAL FORECAST	Existing	2020 - 2029	
	2019	Forecast Change	As at Mid Year-2029
Employment	2,104	399	2,503
Non-Residential Building Space (sq.m.)		25,916	

Figure P-1: Summary of Development Forecast

Source: Hemson Consulting Ltd. Development Charges Background Study, 2020

According to the Development Charges Background Study performed by Hemson in 2020, the above noted growth will increase the Township's overall assessment base and increase user fee and charges revenue. This will offset the costs of life cycle management and capital asset provisions as required.

2. Future Revenue Growth

The calculated annual funding provision should be considered within the context of the Township's projected growth. Over the next ten years (to 2029) the Township is projected to increase by 803 households accommodating 1,944 people. In addition, the Township will also add roughly 400 new employees over the next ten years that will result in approximately 25,920 square metres of additional non-residential building space.

This growth will have the effect of increasing the overall assessment base, as well as increasing user fee and charges revenues. This growth will offset the capital asset provisions required to replace the infrastructure under the proposed Development Charges By-law.

3. Assets Are Deemed to be Financially Sustainable

It is anticipated that new assets identified through the 2020 DC Background Study process will be incorporated into the Township's ongoing asset management plan analyses. The calculated annual provisions identified are considered to be financially sustainable as it is expected that the increased capital asset management requirements can be absorbed by the tax and user base over the long-term.

Figure P-2: Future Growth and Financial Sustainability

Source: Hemson Consulting Ltd. Development Charges Background Study, 2020

Background Information and Reports

All background information and reports will be available to the public by request in accordance with MFIPPA.

Annual Review and Updates

In accordance with legislation, the Council of the Township of Ramara shall conduct an annual review of its asset management progress on or before July 1st of each year. Replacement costs, estimated useful lives, and condition assessments will be updated as assets are inspected, replaced and new advancements in technology and information gathering and embraced.

Appendices

1. Strategic Asset Management Policy
2. Asset Inventory and Date Management Strategy
3. Tangible Capital Asset Policy Manual (to be updated in 2022)