

Town of Gananoque

Asset Management Plan

Prepared in Accordance with
the Infrastructure for Jobs
and Prosperity Fund and
Ontario Regulation 588/17

June 1st, 2022



Executive Summary

The *Infrastructure for Jobs and Prosperity Act, 2015* (the “Act”) was proclaimed by the Province of Ontario on May 1, 2016 and, along with *Ontario Regulation 588/17: Asset Management Planning for Municipal Infrastructure* (O.Reg. 588/17), establishes the requirement for Ontario municipalities to adopt asset management plans for core infrastructure (roads, bridges, water and wastewater management) by July 1, 2022.

The Town of Gananoque (the “Town”) operates and maintains core infrastructure (roads, bridges, water) with a historical cost of \$68.2 million and an estimated replacement cost of \$229.9 million.

While the Town’s core infrastructure is considered to be in a good condition on average, specific components of its core infrastructure are approaching or are at the end of their useful lives. However, the Town’s annual funding for maintenance and capital replacement of core infrastructure is not sufficient to meet its requirements, with the Town forecasted to require an estimated \$114.2 million for lifecycle maintenance activities for core infrastructure over the next ten years. As a result, maintenance and replacement requirements are necessarily deferred, resulting in an increasing infrastructure deficit, continued deterioration of its core infrastructure assets and the potential for reduced levels of service for residents and other users.

Asset management planning is an ongoing process that reflects the strategic asset management policy adopted by the Town and is coordinated with other activities undertaken by the Town, including but not limited to the development of annual service plans for core infrastructure, ongoing needs and conditions assessments undertaken by municipal departments and, arguably most significantly, the Town’s operating and capital budgeting processes. By providing an indication as to the condition, replacement cost, service levels and lifecycle requirements associated with the Town’s core infrastructure, the asset management plan informs other aspects of the Town’s operations, contributing towards a better understanding of the Town’s infrastructure and associated funding requirements so as to ensure the Town meets its service delivery expectations and commitments.

Town of Gananoque

Introduction to the Asset Management Plan



Introduction to the Asset Management Plan

A. Background to the asset management plan

The *Infrastructure for Jobs and Prosperity Act, 2015* (the “Act”) was proclaimed by the Province of Ontario on May 1, 2016 and, along with *Ontario Regulation 588/17: Asset Management Planning for Municipal Infrastructure* (O.Reg. 588/17), establishes the requirement for Ontario municipalities to adopt asset management plans for core infrastructure (roads, bridges, water and wastewater management) by July 1, 2022, with asset management plans for remaining municipal assets adopted by July 1, 2024.

The Act and Regulation outline a variety of requirements intended to enhance asset management planning by municipalities, including the need for a strategic asset management policy, prescribed information required to be addressed in the asset management plans and future efforts to be undertaken by the Town with respect to updating and expanding the level of analysis and planning associated with asset management planning for the Town’s assets and related levels of service.

In keeping with these requirements, the Town adopted an amended strategic asset management policy in 2019 that supports the establishment of consistent standards and guidelines for management of the Town’s assets by applying sound technical, social, economic and environmental principles that consider present and future needs of users, and the service expected from the assets. This means leveraging the lowest total lifecycle cost of ownership with regard to the service levels that best meet the needs of the community while ensuring risks are appropriately managed

The Town’s asset management plan addresses the legislative requirements of the Act and provides support for future decision-making with respect to the Town’s investment in its infrastructure and associated levels of service. As required by the Act, the asset management plan includes the following components:

- A summary of the Town’s assets, including average age and estimated replacement cost;
- An assessment of asset condition;
- Community levels of service that provide a general description of the infrastructure in place and linkages to customers; and
- Technical levels of service, representing quantitative indicators that reflect asset condition or performance.

Introduction to the Asset Management Plan

B. Asset management planning defined

Asset management planning is the process of making the best possible decisions regarding the acquisition, operating, maintaining, renewing, replacing and disposing of infrastructure assets. The objective of an asset management plan is to maximize benefits, manage risk and provide satisfactory levels of service to the public in a sustainable manner. In order to be effective, an asset management plan needs to be based on a thorough understanding of the characteristics and condition of infrastructure assets, as well as the service levels expected from them. Recognizing that funding for infrastructure acquisition and maintenance is often limited, a key element of an asset management plan is the setting of strategic priorities to optimize decision-making as to when and how to proceed with investments. The ultimate success or failure of an asset management plan is dependent on the associated financing strategy, which will identify and secure the funds necessary for asset management activities and allow the Town to move from planning to execution.

C. Scope of the asset management plan

Consistent with the requirements of the Act, the asset management plan encompasses those components of the Town's infrastructure that are considered be core infrastructure assets, specifically:

- Roads
- Bridges
- Water
- Wastewater
- Stormwater management

For the purposes of developing the asset management plan, a ten year planning horizon was considered.

Introduction to the Asset Management Plan

D. Asset management planning objectives

In addition to meeting the legislative requirements under the Act, the asset management plan is intended to enhance the Town's overall policy and planning framework for infrastructure management, while at the same time increasing its internal capacity (through people, information and processes) for effective asset management planning.

A summary of the Town's current state of asset management planning, as well as the intended future state of its capabilities following adoption of the asset management plan is provided below.

Capacity Element	Current State	Future State
Policy and Governance – The Town has developed a formal asset management planning policy and roadmap and measures its progress over time.	The Town has adopted a strategic asset management policy. The Town considers asset management implications as part of its budgeting and forecasting activities.	The Town will establish a roadmap that details required asset management planning action items over the next three to five years, with associated performance measures to monitor progress.
People and Leadership – The Town has cross-functional teams with clear accountabilities, resourcing and support to advance asset management planning.	The Town has functional departments considering asset management planning as part of their budgeting and forecasting activities.	The Town will have an internal management capacity accountable for ongoing implementation, with each department having roles and responsibilities for managing their component of the overall plan.

Introduction to the Asset Management Plan

D. Asset management planning objectives (continued)

Capacity Element	Current State	Future State
Data and Information – The Town is collecting and using relevant data to support effective asset management planning and decision-making.	The Town has an asset inventory based on its tangible capital asset reporting and other available information (e.g. roads needs assessment studies), with informal approaches to assessing asset condition and performance levels.	The Town will have a formal asset inventory that outlines condition assessments and service level standards for critical assets.
Planning and Decision-Making – The Town is documenting and standardizing the approach to establishing asset management planning priorities, capital and operations planning and related budget impacts.	Departments plan for infrastructure renewal based on their individual needs. Infrastructure planning decisions are sometimes made in response to user needs and regulatory requirements, although planning based on service levels is carried out by certain departments.	Asset management planning will be carried out in a more coordinated fashion across the Town, with consideration given to the current and expected levels of service for critical assets.
Contribution to Asset Management Practice – The Town supports asset management planning through internal and external knowledge sharing.	Asset management planning knowledge varies across the organization, with different approaches and formats used for data collection and analysis in support of asset management planning.	The Town will integrate asset management planning into its budgeting and financial reporting processes, providing a single repository for asset management planning data. The Town will also provide ongoing training and support for staff on asset management planning concepts, and dedicate the necessary resources, support and training to facilitate successful asset management practices.

Introduction to the Asset Management Plan

E. Growth assumptions and implications

Over the last five years, the Town's total population has increased by 224 residents (+4.3%), with the number of private households increasing by 251 households (+9.9%). The rate of actual growth over the last five years is higher than the Town's draft official plan for 2021 to 2046, which forecasts population and household growth of approximately 1% per year.

While the absence of significant levels of growth, combined with the small geographic footprint of the Town (7.01 square kilometers), indicates that significant demand for infrastructure expansion (i.e. investments in new infrastructure components) is not expected over the duration of the asset management plan, the Town will continue to face investment requirements associated with the replacement of existing infrastructure. In addition, the potential also exists for the Town to incur significant capital expenditures relating to service level improvements. For example, the Town is contemplating the construction of a new wastewater treatment facility that would replace its existing lagoon systems.

Town of Gananoque

Asset Management Planning for Roads

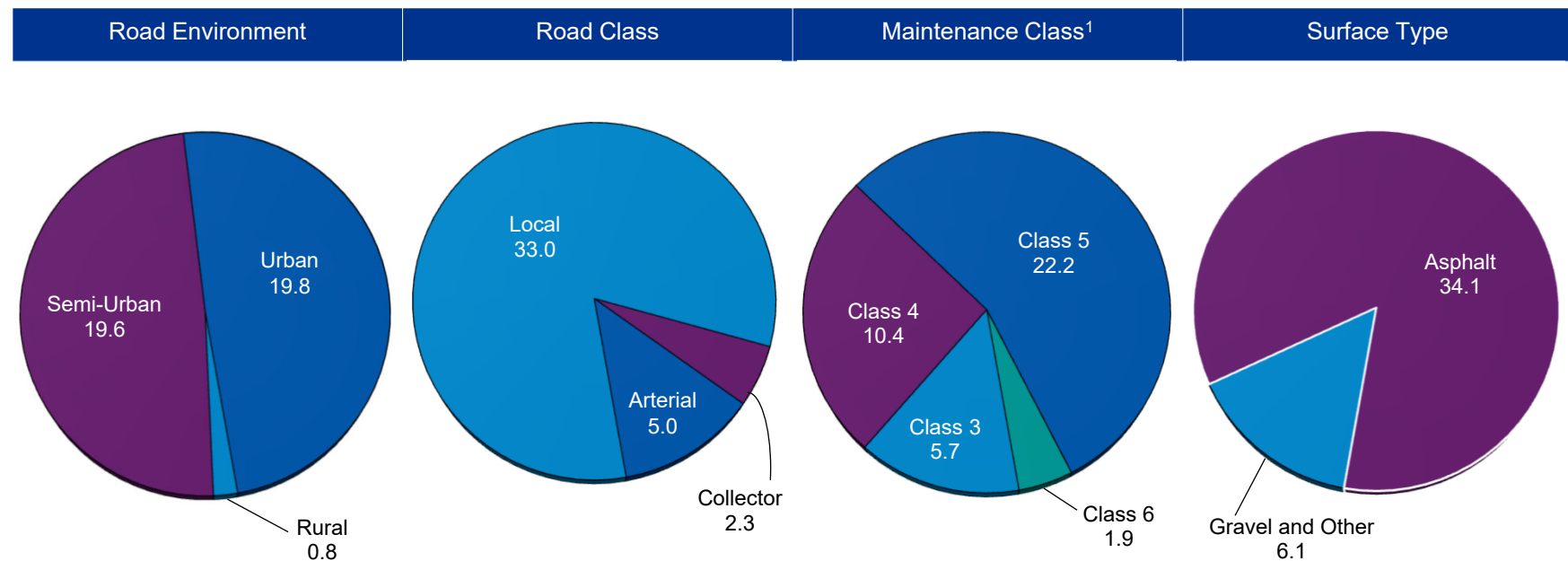


Asset Management Planning for Roads

A. Overview of the Town's road network

The Town's municipal road network is comprised of 40.2 kilometers of roads that connect properties within the municipality to each other and other communities through connections with the Provincial Highway system. As identified by the most recent roads need study completed in April 2016 (the "Roads Needs Study"), the majority of the Town's road network is classified as Class 5 roads under *Ontario Regulation 239/02: Minimum Maintenance Standards for Municipal Highways* ("O.Reg. 239/20").

A summary of the Town's road network is provided below.





¹ Reflects the classification of roads under O.Reg. 239/20, which is determined based on traffic volumes and speed limits. O.Reg. 239/20 establishes minimum maintenance standards based on the classification of roads, with Class 1 roads having the highest standards and Class 6 roads having no minimum standards. The Town currently does not have any roads that classify as Class 1 or Class 2 roads.


Asset Management Planning for Roads

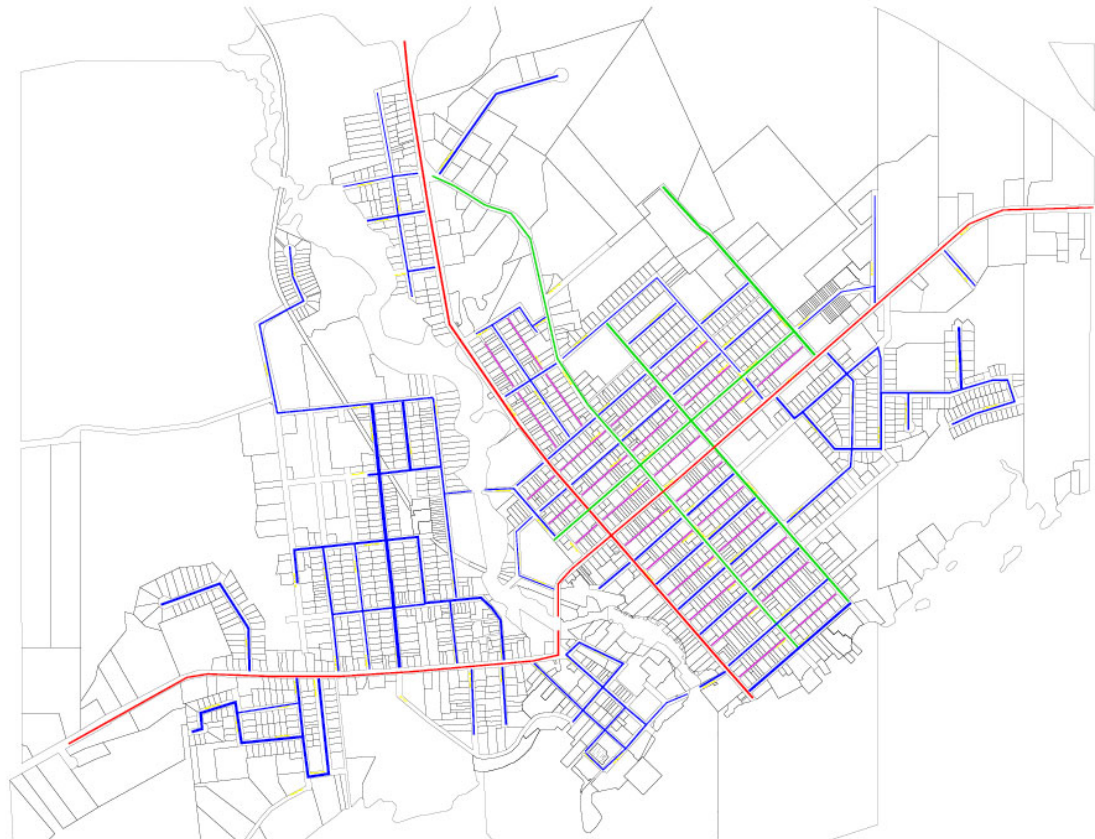
A. Overview of the Town's road network (continued)

Given its small geographic area (7.01 square kilometers), the Town's road network is relatively concentrated in nature, with road access provided to almost all areas of the municipality. Arterial traffic flows in both east-west and north-south directions, with collector and local roads providing connections to properties throughout the Town.

Arterial roads 

Collector roads 

Local roads 



Asset Management Planning for Roads

A. Overview of the Town's road network (continued)

The road network for the Town is comprised of two components:

- Road subsurface, comprised of the granular base that provides drainage and structural support;
- Road surface, which consists of a top layer of either gravel or asphalt (i.e. high class bituminous) that transfers the weight of vehicles to the granular subsurface and underlying ground.

The historical cost of the Town's road network was reported to be \$31.6 million, with an estimated replacement cost (2021) in the order of \$60.8 million².

Surface Type	Number of Lane Kilometers	Average Age (in years)		
		Estimated Useful Life ²	Average Age	Average Remaining Useful Life
Gravel and Other	11.3	60	99.6	1.1%
Asphalt	69.2	60	42.7	44.2%
Total	80.5			

² Based on 2016 reconstruction cost estimates outlined in the Roads Need Study, which quantify costs for different components of road reconstruction (e.g. excavation, ditching, granular materials, surface application). The reconstruction cost has been increased by an annual inflation rate of 5%.

Asset Management Planning for Roads

B. Condition assessment

Condition assessments for the Town's road network were determined as part of the Roads Needs Study based on authoritative guidance that reflect engineering best practices and standards, including but not limited to:

- Pavement Condition Index (PCI) for Flexible Pavement, Ministry of Transportation
- SP-021 Manual for Condition Rating of Surface-Treated Pavements, Distress Manifestations, Ministry of Transportation
- SP-022 Flexible Pavement Condition Rating Guidelines for Municipalities, Ministry of Transportation
- SP-024 Manual for Condition Rating of Flexible Pavements, Distress Manifestations, Ministry of Transportation
- SP-025 Manual for Condition Rating of Gravel Surface Roads, Ministry of Transportation
- Measuring the Condition of Municipal Roads, Ontario Good Roads Association, Ministry of Transportation

As outlined in the Roads Needs Study, condition assessments involved visual inspections of the Town's road network in order to assess the severity and density of distresses in road segments (surface defects, surface deformations and cracking).

The results of the visual inspections were used to determine the structural adequacy and pavement condition index, which provides an indication as to the overall condition of the road segment, as well as the nature and timing of required capital improvements. A summary of condition indices and the associated impact on reinvestment requirements is provided on the following page.

Asset Management Planning for Roads

B. Condition assessment (continued)

Condition Rating	Reinvestment Requirement	PCI
Very Good	None	PCI of 80-100
Good	Rehabilitate	PCI of 60-80
Fair	Resurface (1-5 years)	PCI of 40-60
Poor	Resurface (immediate)	PCI of 20-40
Very Poor	Reconstruct	PCI of 0-20

Based on this approach, the majority of the Town's road network has been classified as being in very good condition (50%), with an average PCI of 72.1.

Condition Rating	Gravel and Other		Asphalt		Total	
	Length (km)	Percentage	Length (km)	Percentage	Length (km)	Percentage
Very Good	1.8	30%	18.4	54%	20.2	50%
Good	1.4	23%	9.7	28%	11.1	28%
Fair	0.6	10%	2.4	7%	3.0	7%
Poor	1.9	30%	2.0	6%	3.9	10%
Very Poor	0.4	7%	1.6	5%	2.0	5%
Average PCI	57.7		74.5		72.1	

Asset Management Planning for Roads

C. Current service levels

The majority of the Town's road network is considered to be urban or semi-urban roads, accounting for 49.2% and 48.8% of the road network, respectively. The remaining road network is comprised of rural roads. Traffic counts conducted as part of the Roads Needs Study indicated that the majority of roads (56%) are used by less than 500 vehicles per day, with nine roads having traffic counts of more than 2,000 road network has been projected at a growth rate of 1%, as the infrastructure is not expected to grow at the vehicles per day. Based on the draft Gananoque Official Plan dated September 28, 2021, the population growth of the Town is anticipated to be 2.4% over the next ten years, or 0.24% per annum. The associated impact on usage of the municipal same rate as the population.

The current and projected traffic volumes for the Town's road network are provided below.

Average Annual Daily Traffic Volumes	Current
Less than 50 vehicles per day	5%
50 to 199 vehicles per day	24%
200 to 499 vehicles per day	26%
500 to 999 vehicles per day	16%
1,000 to 1,999 vehicles per day	10%
2,000 or more vehicles per day	19%

Based on the estimated capacity of the Town's road network and the projected growth, it is not anticipated that the Town will require additional lanes to accommodate the anticipated growth in traffic volumes.

Asset Management Planning for Roads

C. Current service levels (continued)

In addition to requiring a general description of the road network, O.Reg. 588/17 also outlines the qualitative descriptions and technical metrics to be used for describing the current service levels relating to the Town's road network and includes:

- The number of lane kilometers of each category of road (arterial, collector, local) as a proportion of square kilometers of land area of the Town;
- For paved roads, the average PCI value; and
- For unpaved roads, the average surface condition (e.g. excellent, good, fair, poor).

As summary of these service level indicators are provided below.

	Arterial	Collector	Local	Total
Number of lane kilometers	11.2	4.9	63.8	79.9
Town geographic area (in square kilometers)	7.01	7.01	7.01	7.01
Lane kilometers of roads per square kilometer	1.6	0.7	9.1	11.4

	Gravel and Other	Asphalt	Total
Average PCI value	57.7	74.5	72.1
Average condition rating	Fair	Good	Good

Asset Management Planning for Roads

D. Required lifecycle activities

As defined in O.Reg.588/17, lifecycle activities include “*activities undertaken with respect to a municipal infrastructure asset over its service life, including constructing, maintaining, renewing, operating and decommissioning, and all engineering and design work associated with those activities*”. For the purposes of the asset management plan, the estimated cost of lifecycle activities includes:

- The replacement/rehabilitation/reconstruction of roads at the end of their useful lives; and
- The cost of annual maintenance activities required on a periodic basis to maintain the Town’s roads at the current state.

As summarized below, the estimated cost of required lifecycle activities is estimated to be in the order of \$13.4 million over the next ten years.

Year	Lifecycle Maintenance Activities	Capital Works	Total
2021	\$650,000	\$934,467	\$1,584,467
2022	\$663,000	\$465,000	\$1,128,000
2023	\$676,500	\$850,000	\$1,526,500
2024	\$690,000	\$990,000	\$1,680,000
2025	\$704,000	\$520,000	\$1,224,000
2026	\$720,000	\$600,000	\$1,320,000
2027	\$732,000	\$470,000	\$1,202,000
2028	\$744,000	\$500,000	\$1,244,000
2029	\$758,000	\$500,000	\$1,258,000
2030	\$770,000	\$470,000	\$1,240,000
Total	\$7,107,500	\$6,299,467	\$13,406,967

Town of Gananoque

Asset Management Planning for Bridges

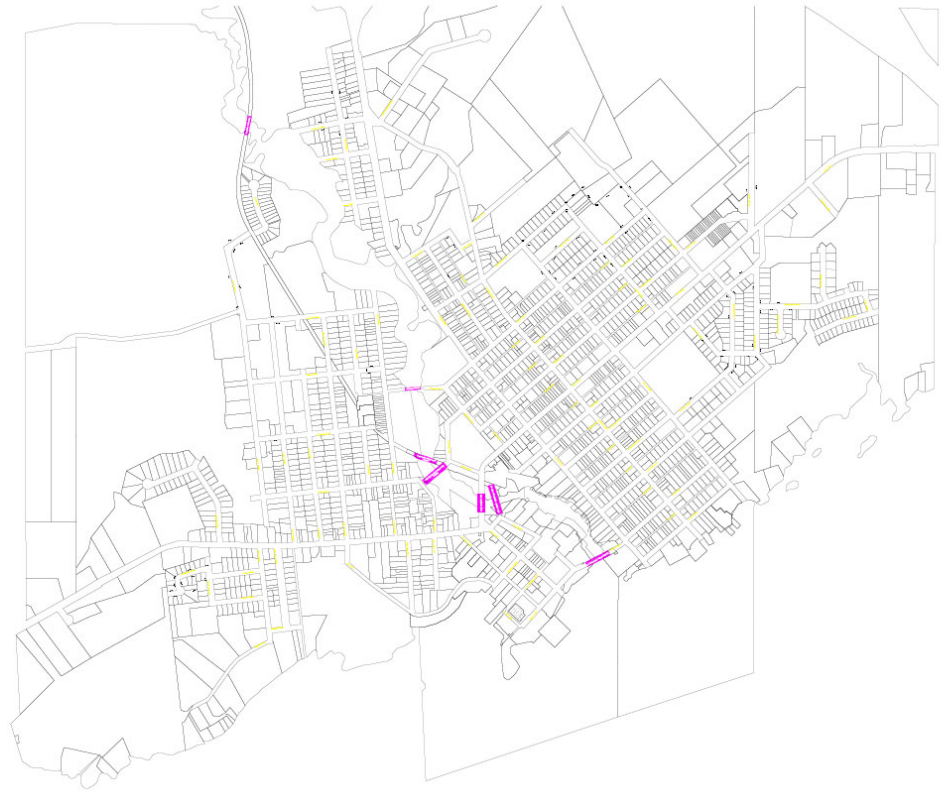
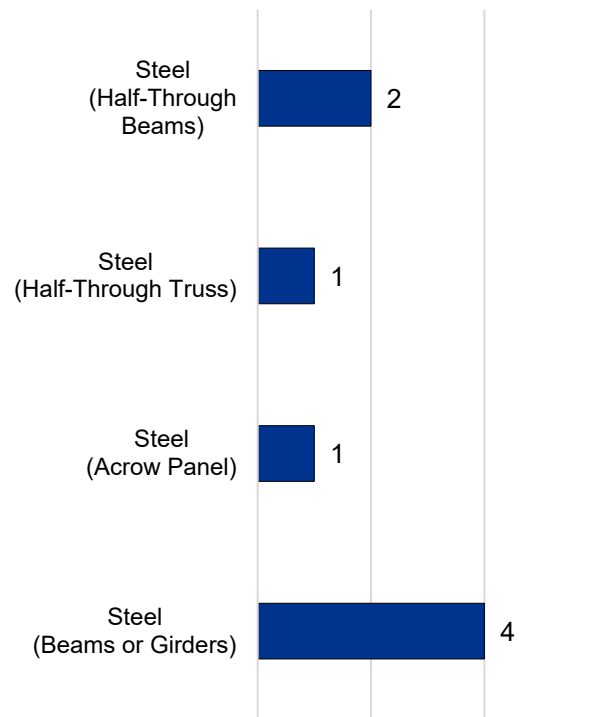


Asset Management Planning for Bridges

A. Overview of the Town's bridges and structures

The Town's municipal road network includes a total of 8 structures of steel construction.

Structures by Type of Construction



Asset Management Planning for Bridges

A. Overview of the Town's bridges and structures (continued)

As at December 31, 2020, the historical cost of the Town's bridges was reported to be \$4.8 million. Based on the most recent engineering assessments and estimates, the replacement cost of the Town's structures was estimated to be \$14.2 million⁵, with an inflation-adjusted replacement cost of \$16.4 million⁶.

For TCA reporting purposes, the Town has adopted a 60 year useful life for bridges and the average age of the Town's bridges was 51 years.

Structure Type	Estimated Useful Life				Replacement Cost (Per OSIM Inspection Report) ⁵	Replacement Cost (Inflation Adjusted) ⁶
	Estimated Useful Life	Maximum Age	Average Age	Average Remaining Useful Life		
Bridges	60	97	51	43%	\$14,180,000	\$16,401,000
Total					\$14,180,000	\$16,401,000

⁵ Based on reconstruction and rehabilitation cost estimates provided in the OSIM Inspection Report, which include provisions for associated work, staging, environmental assessments, engineering design and contingencies.

⁶ The replacement cost has been increased by 6.9% to reflect the rate of inflation in non-residential construction costs from 2020 to 2021.

Asset Management Planning for Bridges

B. Condition assessment

Under Ontario Regulation 104/97: Standards for Bridges (amended by Ontario Regulation 472/10), all municipalities are required to undertake detailed visual inspections in accordance with the Ontario Structure Inspection Manual ('OSIM') of all:

- Bridges, culverts and tunnels with spans of three metres or greater; and
- All movable bridges.

Under Ontario Regulation 104/97, inspections are required every second calendar year.

In addition to establishing the requirements for bi-annual visual inspections, the OSIM defines the guidelines for bridge inspections. Specifically, the OSIM includes Condition State Tables that are used to assess the condition of various bridge components, based on the following ratings:

Condition Rating	Description	Examples
Excellent	<ul style="list-style-type: none">• New (as constructed) condition• No visible deterioration-type defects noted, with minor construction defects excluded• No remedial action required	
Good	<ul style="list-style-type: none">• First signs of minor defects noted• Defects would not normally require remedial action as overall performance is not affected	<ul style="list-style-type: none">• Light corrosion• Narrow cracks in concrete
Fair	<ul style="list-style-type: none">• Medium defects are visible• May require preventative maintenance where it is economic to do so	<ul style="list-style-type: none">• Medium corrosion (up to 10% section loss)• Medium cracks in concrete
Poor	<ul style="list-style-type: none">• Severe and very severe defects are noted• Rehabilitation or replacement required if overall performance is affected	<ul style="list-style-type: none">• Severe corrosion• Spalling

Asset Management Planning for Bridges

B. Condition assessment

The results of the inspection of individual elements is then weighted to provide an overall Bridge Condition Index ('BCI'), which determines the timing of required maintenance activities for the structure under inspection.

BCI	Condition	Maintenance Schedule
70 to 100	Good	No maintenance requirements are identified within the next five years
60 to 69	Fair	Maintenance requirements are identified within the next five years
<60	Poor	Maintenance requirements are identified within one year

Based on this approach, half of the Town's bridges are classified as being in good condition, with the remaining half of the bridges classified as being in fair condition.

BCI	Condition	Number	Percentage
70 to 100	Good	4	50%
60 to 69	Fair	4	50%

Asset Management Planning for Bridges

C. Current service levels

O.Reg. 588/17 outlines the qualitative descriptions and technical metrics to be use for describing the current service levels relating to the Town's bridges, as summarized below.

Service Level Consideration	Assessment
Description of the traffic that is supported by municipal bridges	While the Town's bridges provide access for commercial and passenger vehicles, cyclists and pedestrians, the majority of structures serve residential passenger vehicle movements and pedestrians.
Description of the condition of bridges and how this would affect use of the bridges	While the current condition of the Town's bridges does not have a significant impact on usage at the present time, the requirement for weight restrictions and other aspects of deferred maintenance can impact the ability of certain vehicles to use bridges. In addition, the condition of certain bridges presents a potential a risk of failure which will have an impact on level of service through either closure of the bridges or the imposition of further weight limitations. The prospect of a bridge failure would also be accompanied by the need for the Town to incur significant expenses with respect to the repair or replacement of the structure in question.
Percentage of bridges with loading or dimensional restrictions	There are currently no bridges with loading or dimensional restrictions.
Average bridge condition index for bridges	73.76

Asset Management Planning for Bridges

D. Required lifecycle activities

As defined in O.Reg.588/17, lifecycle activities include “*activities undertaken with respect to a municipal infrastructure asset over its service life, including constructing, maintaining, renewing, operating and decommissioning, and all engineering and design work associated with those activities*”. The determination of required lifecycle activities, including the related cost and timing, is identified in the OSIM Inspection Report and includes the following:

- Routine maintenance, which includes erosion control, handrail maintenance, replacing missing and damaged signs and other minor repairs. The OSIM Inspection Report identifies three bridges that are currently in need of maintenance.
- Additional studies, investigations and monitoring programs for structures with significant deficiencies, the purpose of which is to provide more a more detailed assessment of capital requirements.
- Capital works (repairs, rehabilitation or replacement) that would extend the service life of the structure or increase its BCI. The OSIM Inspection Report identifies four bridges that are currently in need of rehabilitation, with one bridge slated for closure by 2025 due concerns surrounding the structural steel. All four of the bridges have been identified as requiring rehabilitation within the next five years.

Leveraging the information identified in the 2020 OSIM Inspection Report, the estimated level of lifecycle investments over the next ten years as identified in the OSIM Inspection Report is \$13,863,250. Based on the 2020 to 2021 rate of inflation (6.9%), the required level of lifecycle investment has been calculated to be \$15,978,375.

Asset Management Planning for Bridges

D. Required lifecycle activities (continued)

Year	Rehabilitation	Additional Studies	Capital Works	Total
2021	\$883,575	\$10,500	–	\$894,075
2022	The OSIM Inspection Report has only identified requirements based on the current condition of the Town's structures and has not outlined requirements and the estimated cost associated with an ongoing maintenance program that would address future requirements over the ten-year planning period.		–	–
2023			–	–
2024			\$1,928,850	\$1,928,850
2025			–	–
2026			\$877,800	\$877,800
2027			\$4,793,250	\$4,793,250
2028			–	–
2029			\$1,617,000	\$1,617,000
2030			\$5,867,400	\$5,867,400
Total	\$ 883,575	\$10,500	\$15,084,300	\$15,978,375

In arriving at the recommended lifecycle requirements, the OSIM Inspection Report identifies capital requirements necessary to address potential health and safety risks to users and/or replace or rehabilitate bridges. As a result, the required lifecycle activities accommodates a gradual reduction in the overall BCI of the Town's structures while still maintaining BCI's in the good to fair range, which allows for minimal impact on service levels.

Asset Management Planning for Bridges

D. Required lifecycle activities (continued)

The current level of funding for both the maintenance of bridges and their eventual replacement at the end of useful life is not sufficient to meet the identified needs for the Town's bridges. While deferral of maintenance and replacement can be considered, this is expected to increase the potential risk of failure for a structure. Additionally, while the abandonment of structures can be considered, this is not expected to be a viable strategy as most structures are located on local roads and cannot be abandoned as they are required to provide road access to residents, emergency vehicles and other users.

Town of Gananoque

Asset Management Planning for Environmental Services



Asset Management Planning for Environmental Services

A. Overview of the Town's environmental services assets

The Town's environmental services includes the maintenance of infrastructure supporting the delivery of water, sanitary sewer and storm water management in compliance with various Provincial legislation and regulations.

The historical cost of the Town's environmental services assets was reported to be \$31.8 million, with an estimated replacement value of \$146.7 million.

For TCA reporting purposes, the Town has established useful lives of 60 years for its environmental services assets. As noted below, the average remaining useful lives of environmental services assets is relatively low.

Asset Type	Useful Life (Years)	Inventory	Age (Years)				Historical Cost	Replacement Cost ⁷
			Minimum	Maximum	Average	Average Remaining Useful Life		
Sanitary Sewer	60	33,360 m	2	118	55	4.6%	\$11,911,514	\$47,724,344
Storm Sewer	60	43,476 m	1	96	57	5.0%	\$4,548,589	\$29,968,684
Water	60	34,751 m	2	118	49	18.9%	\$15,337,798	\$69,025,148
Total							\$31,797,901	\$146,718,176

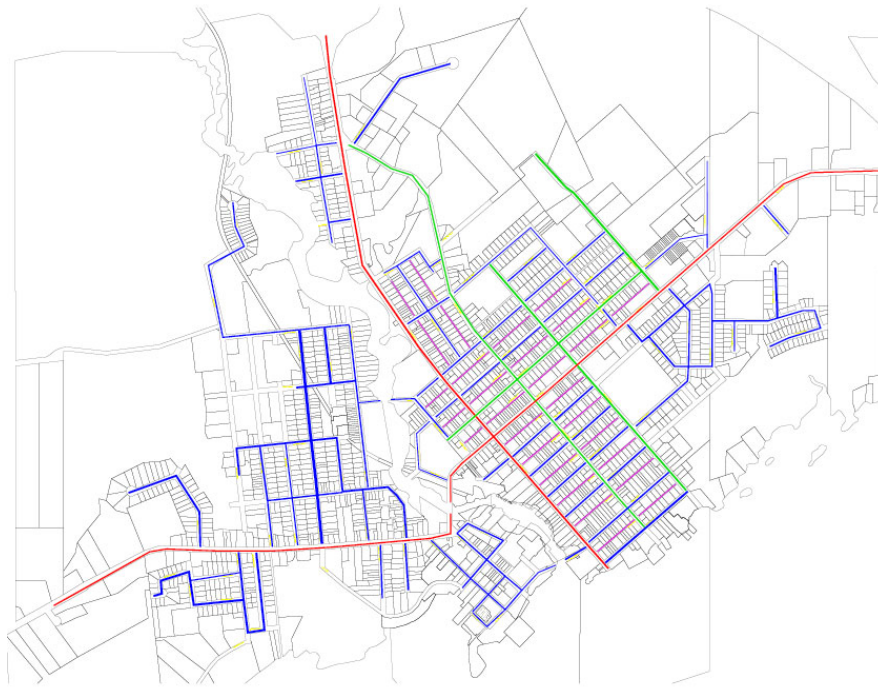
The Town's water system also supports fire suppression capabilities through adequate pressures for peak fire flows, as well as a network of hydrants throughout the community.

⁷ The replacement value of the Town's environmental services assets was determined based on the assessed replacement value in 2012, adjusted for an annual inflation rate of 5%.

Asset Management Planning for Environmental Services

A. Overview of the Town's environmental services assets (continued)

Water Network



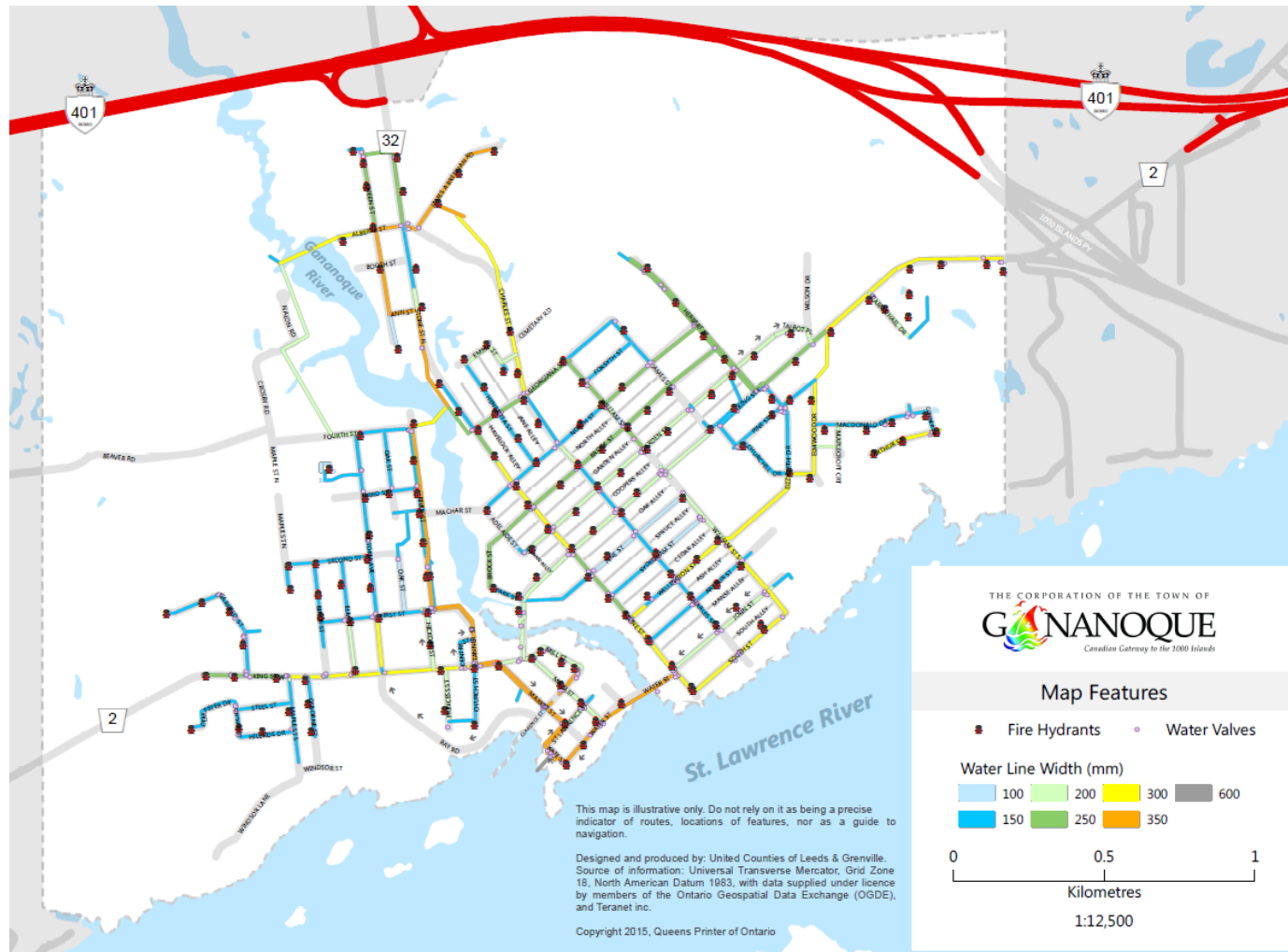
Hydrant Network



Asset Management Planning for Environmental Services

A. Overview of the Town's environmental services assets (continued)

Waterworks



Asset Management Planning for Environmental Services

A. Overview of the Town's environmental services assets (continued)

Sanitary Sewer Network



Storm Water Network



Asset Management Planning for Environmental Services

B. Condition assessment

The condition of the Town's environmental services assets has been assessed based on the remaining percentage of their estimated useful lives, reflecting both the fact that these assets are typically held until the end of their useful lives and the difficulties inherent in assessing the condition of underground infrastructure. As summarized below, most of the Town's environmental services assets are rated as being in very poor condition, reflecting their age and the approaching end of useful life.

Condition Rating	Remaining Useful Life	Sanitary Sewer	Storm Sewer	Water
Very Good	More than 75%	10%	15%	9%
Good	50% to 75%	9%	9%	22%
Fair	25% to 49%	21%	0%	22%
Poor	10% to 25%	15%	10%	18%
Very Poor	Less than 10%	45%	66%	30%

Asset Management Planning for Environmental Services

C. Current service levels

O.Reg. 588/17 outlines the qualitative descriptions and technical metrics to be use for describing the current service levels relating to the Town's environmental services infrastructure and includes the following:

Water Infrastructure

Qualitative Descriptions	
<ul style="list-style-type: none"> A description of the user groups or areas of the municipality that are connected to the municipal water system. 	<ul style="list-style-type: none"> The Town currently manages water systems with approximately 2,400 water customers.
<ul style="list-style-type: none"> A description of the user groups or areas of the municipality that have fire flow. 	<ul style="list-style-type: none"> The Town has 234 fire hydrants. In 2018, 230 hydrants were tested for fire flow and in 2021, additional fire flow testing was performed over 43 hydrants.
<ul style="list-style-type: none"> A description of boil water advisories and service interruptions. 	<ul style="list-style-type: none"> The Town has not declared boil water advisories in the past two years. Over the last two years, the Town has experienced three to four watermain breaks per year.
Technical Levels of Service	
<ul style="list-style-type: none"> The percentage of properties connected to the municipal water system. 	<ul style="list-style-type: none"> The Town currently provides water services to approximately 2,400 customers, representing approximately 85% of total households within the Town.
<ul style="list-style-type: none"> The percentage of properties where fire flow is available. 	<ul style="list-style-type: none"> The Town is currently in the process of determining the percentage of properties with fire flows.
<ul style="list-style-type: none"> The number of connection days per year where a boil water advisory notice is in place compared to the total number of properties connected to the municipal water system. 	<ul style="list-style-type: none"> The Town has declared one boil water advisory in the past two years, representing as many as 2,343 connection-days per year. This represents approximately 0.3% of the total connection-days per year in the Town.
<ul style="list-style-type: none"> The number of connection-days per year due to water main breaks compared to the total number of properties connected to the municipal water system. 	<ul style="list-style-type: none"> Over the last two years, the Town has experienced one to four watermain breaks per year, representing as many as 9,372 connection-days per year. This represents approximately 1% of the total connection-days per year in the Town.

Asset Management Planning for Environmental Services

C. Current service levels (continued)

Sanitary Sewer Infrastructure

Qualitative Descriptions	
<p>Description, which may include maps, of the user groups or areas of the municipality that are connected to the municipal wastewater system.</p>	<ul style="list-style-type: none"> The Town currently manages wastewater systems with approximately 2,400 wastewater customers.
<ul style="list-style-type: none"> Description of how combined sewers in the municipal wastewater system are designed with overflow structures in place which allow overflow during storm events to prevent backups into homes. Description of the frequency and volume of overflows in combined sewers in the municipal wastewater system that occur in habitable areas or beaches. Description of how stormwater can get into sanitary sewers in the municipal wastewater system, causing sewage to overflow into streets or backup into homes. Description of how sanitary sewers in the municipal wastewater system are designed to be resilient to avoid events described in paragraph 3. Description of the effluent that is discharged from sewage treatment plants in the municipal wastewater system. 	<ul style="list-style-type: none"> The Town does not have combined sewers. Storm water enters into sanitary sewers through approved and unapproved sump pump connections, misdirected storm water runoff and cracks in sewer laterals. The Town no longer allows sump pump connections to sanitary. The older infrastructure is being updated using the 10 year capital plans reconstruction projects. The Town of Gananoque uses a 3 celled sewage lagoon system. Once the sewage enters the first cell it flows from one cell to the next, allowing the settling of solids and reduction of dissolved nutrients. The final effluent of the Lagoon then discharges to the St Lawrence River. Treated effluent samples are collected weekly testing for CBOD5, TSS, TP, E.coli and pH.
Technical Levels of Service	
<ul style="list-style-type: none"> The percentage of properties connected to the municipal wastewater system. 	<ul style="list-style-type: none"> The Town currently provides wastewater services to approximately 2,400 customers, representing approximately 85% of total households within the Town.
<ul style="list-style-type: none"> The number of events per year where combined sewer flow in the municipal wastewater system exceeds system capacity compared to the total number of properties connected to the municipal wastewater system. 	<ul style="list-style-type: none"> During the preceding two calendar years, the Town experienced between 19 and 21 wastewater main backups per year, representing 0.9% of the total number of properties connected to the municipal wastewater system.
<ul style="list-style-type: none"> The number of connection-days per year due to wastewater backups compared to the total number of properties connected to the municipal wastewater system. 	<ul style="list-style-type: none"> The Town has experienced an average of 48,000 connection days of wastewater backups, representing 4% of the total annual connection days.
<ul style="list-style-type: none"> The number of effluent violations per year due to wastewater discharge compared to the total number of properties connected to the municipal wastewater system. 	<ul style="list-style-type: none"> The Town has established a target of 200cfu/100 ml of wastewater discharge, which has not been exceeded in 2019 or 2020, but was exceeded in 2021.

Asset Management Planning for Environmental Services

C. Current service levels (continued)

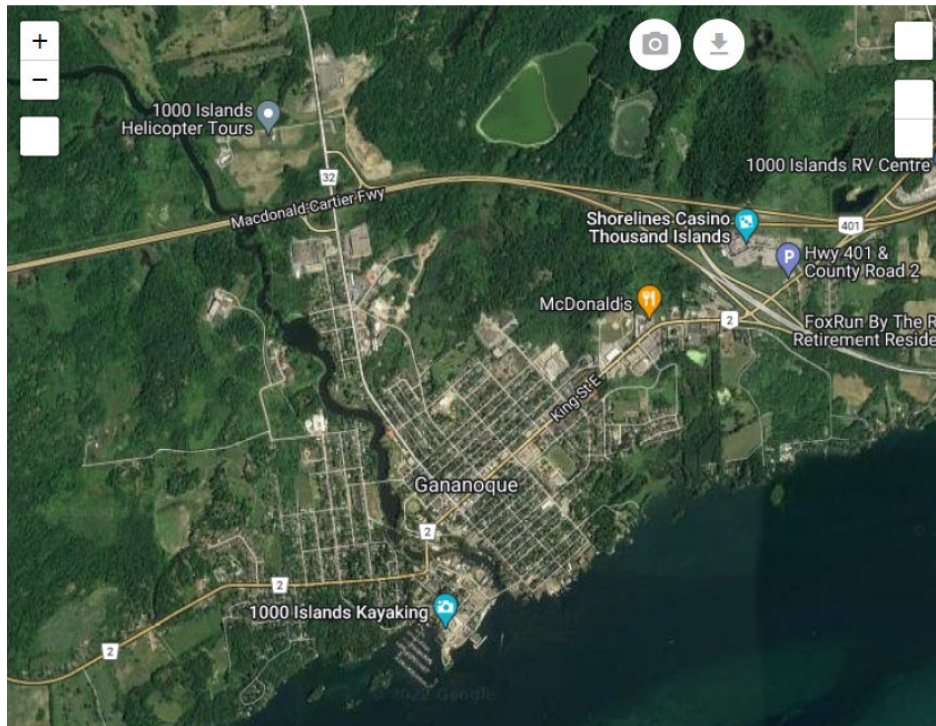
Stormwater Management Infrastructure

Qualitative Descriptions	
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.	The Town's stormwater management system provides protection for the majority of the urban area of the municipality.
Technical Levels of Service	
<ul style="list-style-type: none">Percentage of properties in municipality resilient to a 100-year storm.	The Town estimates that more than 80% of its geographic area and households are resilient to a 100-year flood. A map of the potential maximum exposure to a 100-year flood is provided on the following page.
<ul style="list-style-type: none">Percentage of the municipal stormwater management system resilient to a 5-year storm.	The Town's stormwater management system is fully resilient to a 5-year storm.

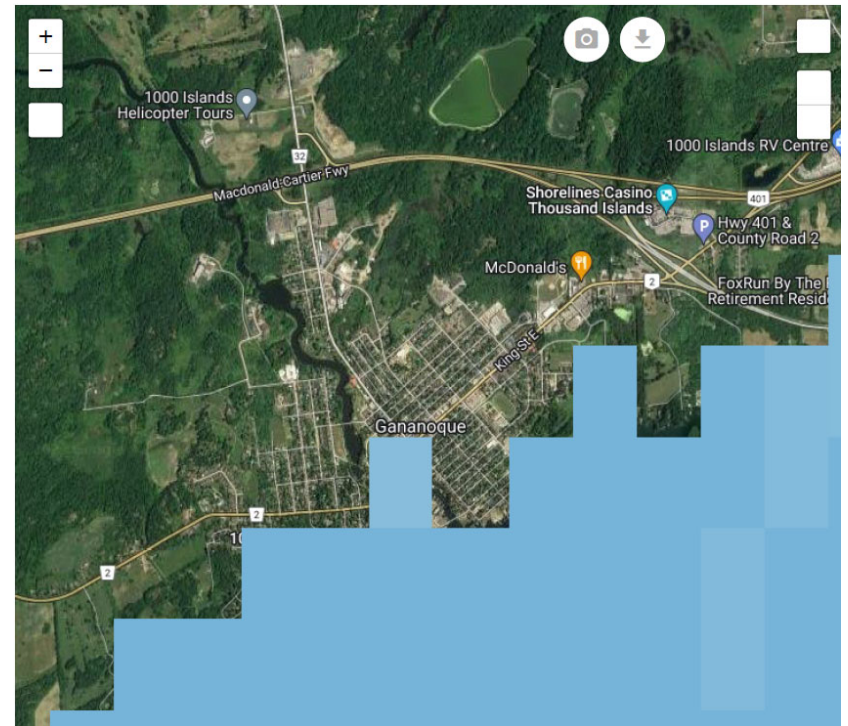
Asset Management Planning for Environmental Services

C. Current service levels (continued)

Current State (unflooded)



Projected 100-Year Flood Area



Asset Management Planning for Environmental Services

D. Required lifecycle activities

As defined in O.Reg.588/17, lifecycle activities include “*activities undertaken with respect to a municipal infrastructure asset over its service life, including constructing, maintaining, renewing, operating and decommissioning, and all engineering and design work associated with those activities*”.

Typically, asset management strategies for water mains will depend on the nature of the mains (ductile iron, PVC, concrete) but will generally commence within 20 years of the installation of the main and continue at recommended intervals until complete replacement of the main is required.

Year	Activity	Estimated Cost per KM
20	Valve exercise and swabbing	\$60,500
40	Appurtenance replacement and swabbing	\$157,300
Total cost of lifecycle asset activities (excluding replacement)		\$217,800
Average cost per year		\$5,650
Number of kilometers of water mains (rounded)		34.8
Estimated annual cost of lifecycle activities (excluding end-of-life replacement requirements)		\$196,620

Asset Management Planning for Environmental Services

D. Required lifecycle activities (continued)

Similarly, asset management strategies for sanitary and storm sewer mains will generally commence within 20 years of the installation of the main and continue at recommended intervals until complete replacement of the main is required.

Year	Activity	Estimated Cost per KM
20	Camera inspection, cleaning, flushing and structure inspection	\$94,600
50	Replacement of 60% of structure	\$192,500
Total cost of lifecycle asset activities (excluding replacement)		\$287,100
Average cost per year		\$7,950
Number of kilometers of sanitary and storm mains (rounded)		76.9
Estimated annual cost of lifecycle activities (excluding end-of-life replacement requirements)		\$611,355

Criteria typically used to determine replacement of water, sanitary and storm sewer mains include, but are not limited to, surrounding soil conditions, pressure related issues, and hydrant spacing. In addition to these criteria other factors, such as the intent of future road rehabilitation, will modify the priority of the replacement schedule accordingly.

Available historical data, which includes but is not limited to pipe failures and pipe break history, is used to aid in the replacement criteria. When a continued increase in maintenance costs reaches an uneconomical value, the replacement is justified. Due to unaccounted circumstances and unpredictable events, it is possible that some pipe materials will require replacement earlier than expected. In contrast, pipe materials may have the service life extended, with timely maintenance and rehabilitation.

Asset Management Planning for Environmental Services

D. Required lifecycle activities (continued)

The required lifecycle activities associated with the replacement of water assets reaching end of useful life over the next ten years, which is based on the existing useful lives adopted for TCA reporting purposes, is \$84.8 million.

Year	Sanitary Sewer	Storm Sewer	Water	Total
2021	\$22,446,801	\$20,081,040	\$22,199,075	\$64,726,916
2022	\$308,392	—	\$752,887	\$1,061,279
2023	—	—	—	—
2024	—	\$3,658,611	—	\$3,658,611
2025	\$843,018	—	\$3,994,498	\$4,837,516
2026	—	—	\$152,015	\$152,015
2027	\$864,138	—	\$1,317,125	\$2,181,263
2028	\$2,441,575	—	\$4,790,606	\$7,232,181
2029	\$522,454	—	\$458,365	\$980,819
2030	—	—	—	—
Total	\$27,426,378	\$23,739,651	\$30,664,571	\$84,830,600

Town of Gananoque

Next Steps



Next Steps

As required by the Act, the Town will undertake the following ongoing activities related to asset management planning:

- Updating the strategic asset management policy every five years, with the next update expected in 2024;
- Updating the asset management plan for core infrastructure every five years, with the next update expected in 2026;
- Completing a similar asset management plan for other assets on or before July 1, 2024;
- Updating the asset management plan for proposed levels of service (which may differ from current levels of service) on or before July 1, 2025; and
- Providing Council with an annual update as to the Town's progress against the asset management plan.

In addition to these requirements, the Town will be providing ongoing training for asset management planning to municipal personnel and will also be integrating asset management planning into its new information management system, providing a better linkage between asset management planning and the Town's financial reporting systems.