

Corporation of the Town of
Perth

Asset Management Plan

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



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 plan requires concentration of core assets but the Corporation of the Town of Perth (the “Town”) has prepared the plan based on all assets.

The Town operates and maintains its infrastructure (roads, bridges, water, vehicles, buildings and equipment) with a historical cost of \$95 million, a 2022 estimated replacement cost of \$355 million, and planned capital and maintenance costs over the term of the plan of \$201 million.

While the Town’s infrastructure is considered to be in a good condition on average, specific components of its infrastructure are approaching or are at the end of their useful lives. However, the Town’s annual funding for maintenance and capital replacement of infrastructure is not sufficient to meet its requirements, with the Town forecasted to require an estimated \$201 million for lifecycle maintenance activities for infrastructure over the next fourteen years. As a result, maintenance and replacement requirements are necessarily deferred, resulting in an increasing infrastructure deficit, continued deterioration of its 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 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 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.

Corporation of the Town of Perth

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 town has moved ahead and prepared a plan covering all assets including vehicles, equipment, land and buildings thus is ahead of the requirement by the Province.

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, however the town has included all assets, specifically:

- Roads
- Bridges
- Water
- Wastewater
- Stormwater management
- Vehicles
- Buildings and Equipment

For the purposes of developing the asset management plan, a 14 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
<p>Policy and Governance – The Town has developed a formal asset management planning policy and roadmap and measures its progress over time.</p>	<p>The Town has adopted a strategic asset management policy. The Town considers asset management implications as part of its budgeting and forecasting activities.</p>	<p>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.</p>
<p>People and Leadership – The Town has cross-functional teams with clear accountabilities, resourcing and support to advance asset management planning.</p>	<p>The Town has functional departments considering asset management planning as part of their budgeting and forecasting activities.</p>	<p>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.</p>

Introduction to the Asset Management Plan

D. Asset management planning objectives (continued)

Capacity Element	Current State	Future State
<p>Data and Information – The Town is collecting and using relevant data to support effective asset management planning and decision-making.</p>	<p>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.</p>	<p>The Town will have a formal asset inventory that outlines condition assessments and service level standards for critical assets.</p>
<p>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.</p>	<p>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.</p>	<p>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.</p>
<p>Contribution to Asset Management Practice – The Town supports asset management planning through internal and external knowledge sharing.</p>	<p>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.</p>	<p>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.</p>

Introduction to the Asset Management Plan

E. Growth assumptions and implications

Between 2016 and 2021, the Town's total population increased by 539 residents (+9.1%), with the number of private households increasing by 223 households (+7.0%). The 2019 Official Plan for the Town (currently under review) set out a target population of 8,085 by the year 2038 (+25%). This projected average annual rate of growth of 1.5% to 2038 is somewhat less than the 1.8% over the last 5 years though the current review of the Official Plan may result in an increase in the total growth projections.

The western annex lands currently display the volatility of large-scale development with potential infrastructure additions that include a multi-lane bridge, buried infrastructure, a water tower and additional loading on existing transportation corridors over the next 3-5 years. The potential addition of increased infrastructure combined with the perpetual maintenance of the existing infrastructure will increase the strain on the existing tax and rate-based funding sources.

Corporation of the Town of Perth

Asset Management Planning for Roads

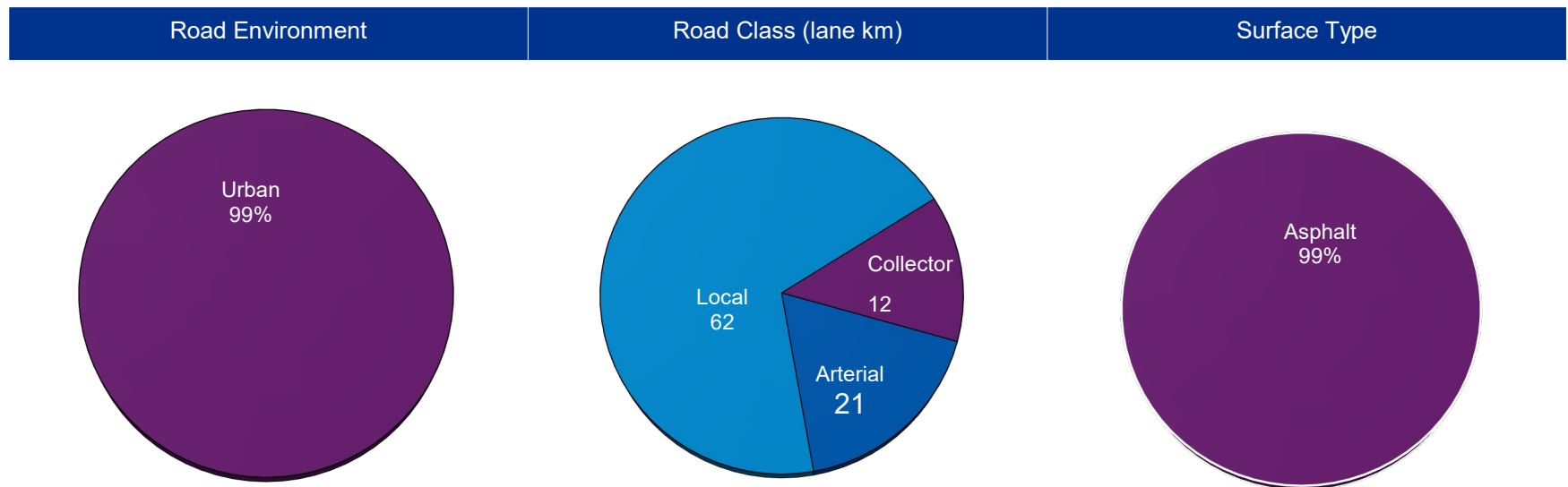


Asset Management Planning for Roads

A. Overview of the Town's road network

The Town's municipal road network is comprised of 95 lane 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 May 2021 (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.

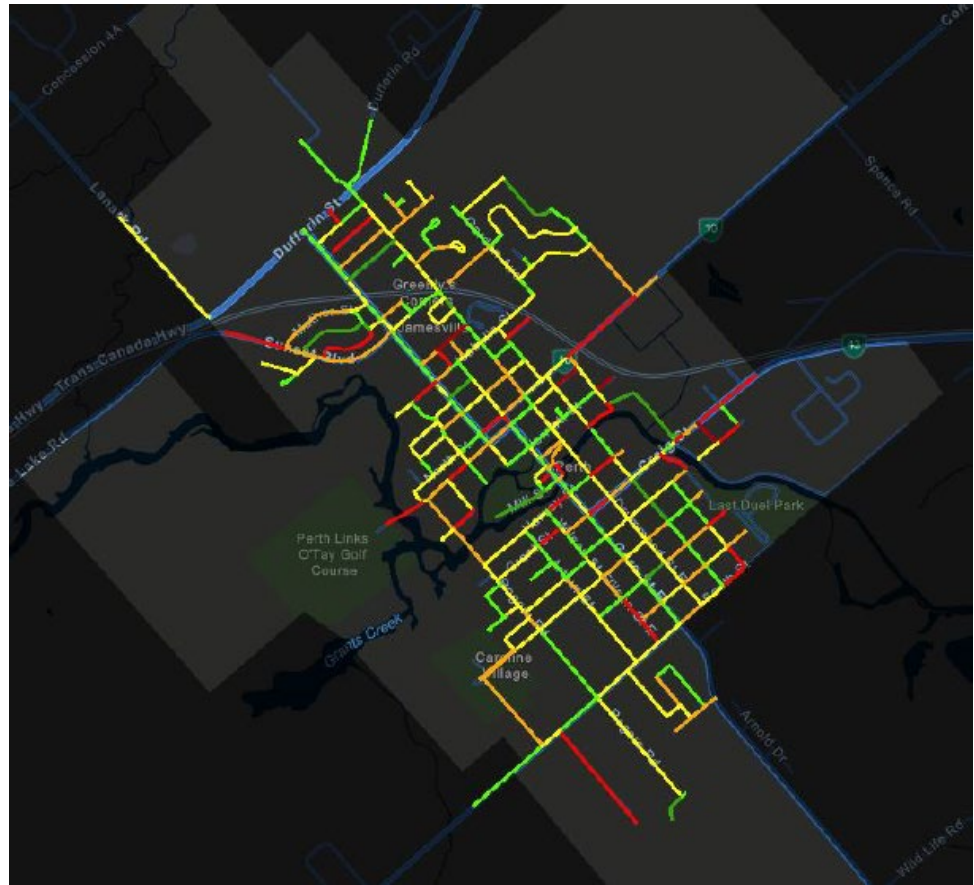


¹ Reflects the classification of roads under O.Reg. 239/20, which is determined based on traffic volumes and speed limits. O.Reg. 239/20 establishes minimum maintenance standards based on the classification of roads, with Class 1 roads having the highest standards and Class 6 roads having no minimum 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 (12.21 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.



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 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 \$23.4 million, with an estimated replacement cost (2022) in the order of \$64.3 million, and with an estimated replacement cost and end of useful life of \$195.0 million².

Surface Type	Number of Lane Kilometers	Average Age (in years)		
		Estimated Useful Life ²	Average Age	Average Remaining Useful Life
Asphalt	95.0	25-65	29	48.1%
Total	95.0			

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 8.5%.

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
Excellent	Defer Maintenance	PCI of 85-100
Good	Preventative Maintenance	PCI of 70-85
Fair	Resurface (1-5 years)	PCI of 55-70
Poor	Resurface (immediate)	PCI of 40-55
Very Poor	Reconstruct	PCI of 25-40
Serious or Failed	Reconstruct	PCI of 0-25

Based on this approach, the majority of the Town's road network has been classified as being in good condition (36.9%), with an average PCI of 61.8.

Condition Rating	Length (Lane km)	Percentage
Excellent	5.3	5.5%
Good	26.4	27.8%
Fair	34.1	36.0%
Poor	17.0	17.9%
Very Poor	11.0	11.6%
Serious or Failed	1.2	1.2%
Total Lane Kilometers	95.0	

Asset Management Planning for Roads

C. Current service levels

Virtually all of the Town's road network is considered to be urban roads with only a small percentage being comprised of rural roads. Traffic counts conducted as part of the Roads Needs Study indicated that the majority of roads (63%) are used by less than 1000 vehicles per day. The Official Plan for the Town is currently under development and population growth will be updated in the asset management plan when the Official Plan is available. The associated impact on usage of the municipal road system is projected to increase at the same rate as the population growth.

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	4.6%
50 to 199 vehicles per day	12.1%
200 to 499 vehicles per day	24.5%
500 to 999 vehicles per day	21.6%
1,000 to 1,999 vehicles per day	8.9%
2,000 or more vehicles per day	28.3%

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	20.8	12.1	62.1	95.0
Town geographic area (in square kilometers)	12.21	12.21	12.21	12.21
Lane kilometers of roads per square kilometer	1.7	1.0	5.1	7.8

	Asphalt
Average PCI value	61.8
Average condition rating	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 \$54.3 million over the next fourteen years. The year 2035 includes all road segments which have not been specifically identified in another year but have reached (or exceeded) the end of their useful lives.

Year	Lifecycle Maintenance Activities	Capital Works	Total
2022	–	\$1,969,616	\$1,969,616
2023	\$30,000	\$447,438	\$477,438
2024	\$30,000	\$669,153	\$699,153
2025	\$30,000	\$256,816	\$286,816
2026	\$30,000	\$2,093,529	\$2,123,529
2027	–	\$1,748,021	\$1,748,021
2028	–	\$231,995	\$231,995
2029	–	\$61,869	\$61,869
2030	–	\$1,504,731	\$1,504,731
2031	–	\$6,039,048	\$6,039,048
2032	–	\$1,322,437	\$1,322,437
2033	–	\$1,953,289	\$1,953,289
2034	–	\$4,224,180	\$4,344,180
2035	–	\$31,500,404	\$31,500,404
Total	\$120,000	\$54,022,527	\$54,142,527

Corporation of the Town of Perth

Asset Management Planning for Bridges

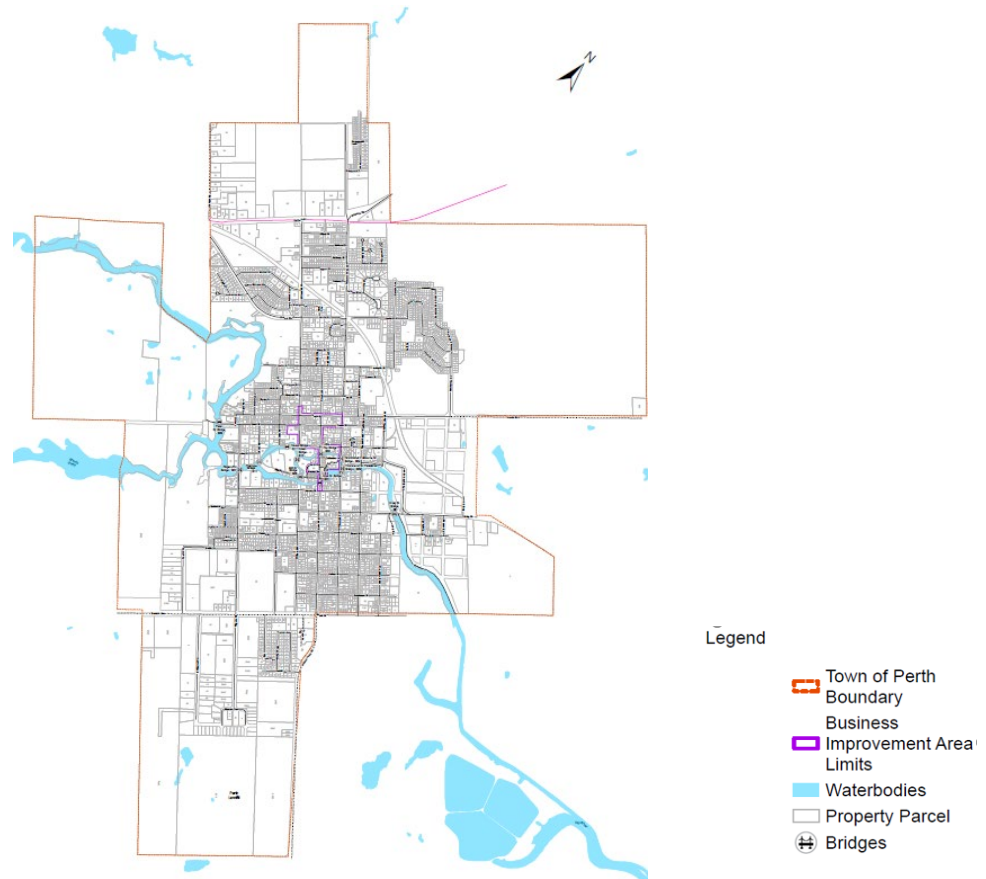
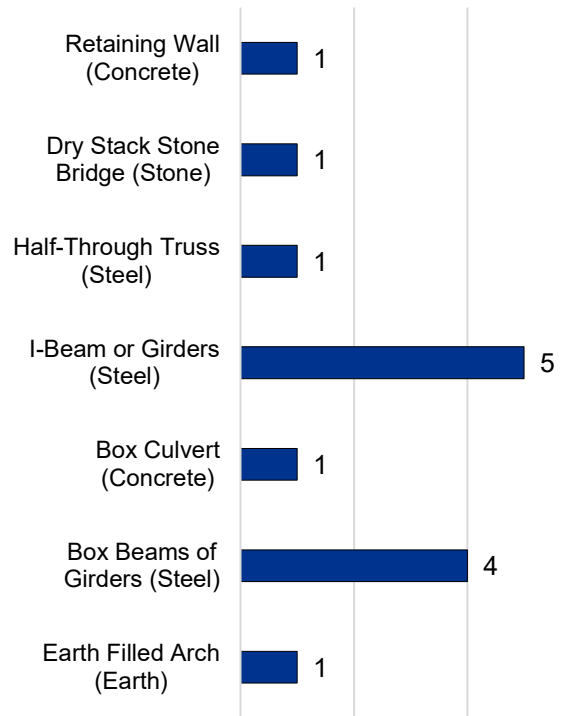


Asset Management Planning for Bridges

A. Overview of the Town's bridges and structures

The Town's municipal road network includes a total of 14 structures of steel, concrete, stone, or earth 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, 2021, the historical cost of the Town's bridges was reported to be \$5.1 million. Based on the most recent engineering assessments and estimates, the replacement cost of the Town's structures was estimated to be \$23.1 million⁵, with an inflation-adjusted replacement cost of \$34.2 million⁶.

For TCA reporting purposes, the Town has adopted a 50 year useful life for bridges and the average age of the Town's bridges in 2022 is 49 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	50	117	48.9	2%	\$23,106,100	\$34,222,952
Total					\$23,056,100	\$34,222,952

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 37.6% to reflect the rate of inflation in non-residential construction costs from 2019 to 2022.

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	9	64%
60 to 69	Fair	5	36%

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	70.7

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 9 bridges that are currently in need of rehabilitation. All nine bridges have been identified as requiring rehabilitation within the next five years.

Leveraging the information identified in the 2021 OSIM Inspection Report, the estimated level of lifecycle investments over the next ten years as identified in the OSIM Inspection Report is \$1,813,800. Based on the 2019 to 2021 rate of inflation (37.6%), the required level of lifecycle investment has been calculated to be \$2,495,789.

Asset Management Planning for Bridges

D. Required lifecycle activities (continued)

Year	Rehabilitation	Additional Studies	Capital Works	Total
2022	–	–	1,524,629	\$1,524,629
2023	The OSIM Inspection Report has only identified requirements based on the current condition of the Town's structures and has not outlined the requirements and the estimated costs associated with potential replacement of bridge structures or potential costs after the year 2032.		16,471	16,471
2024			58,170	58,170
2025			76,868	76,868
2026			–	–
2027			45,100	45,100
2028			–	–
2029			–	–
2030			2,437,495	2,437,495
2031			–	–
2032			96,679	96,679
2033			–	–
2034			–	–
2035			–	–
Total	\$0	\$0	\$4,255,421	\$4,255,421

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.

Corporation of the Town of Perth

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 \$42.1 million, with an estimated 2022 replacement value of \$134.5 million.

For TCA reporting purposes, the Town has established useful lives of 65 years for its environmental services assets. As noted below, the average remaining useful lives of environmental services assets is relatively low.

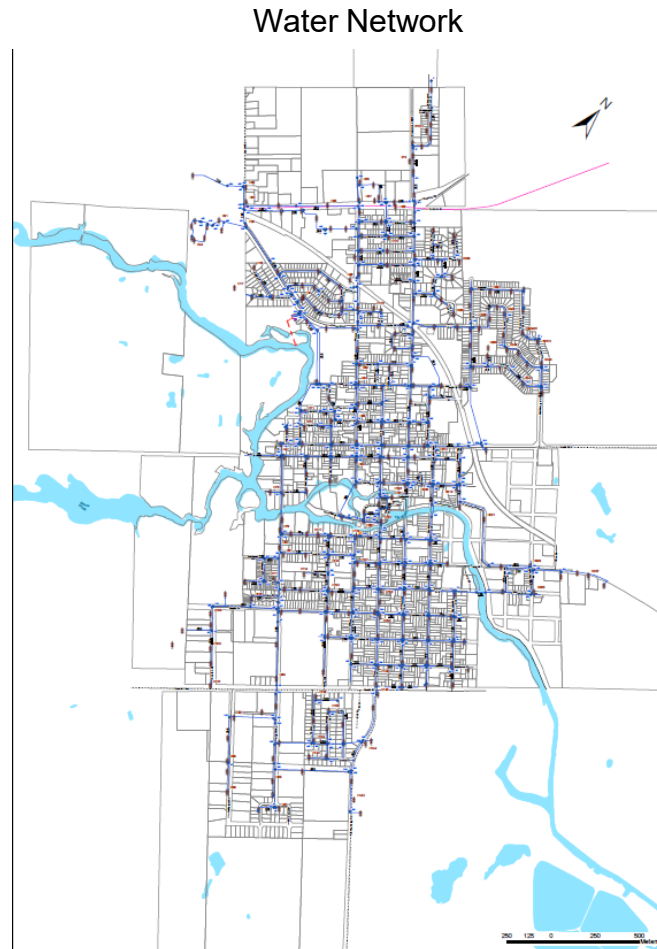
Asset Type	Useful Life (Years)	Inventory	Age (Years)				Historical Cost	Replacement Cost ⁷
			Minimum	Maximum	Average	Average Remaining Useful Life		
Sanitary Sewer	65	48 km	5	97	42.0	35.4%	\$21,292,015	\$57,225,354
Storm Sewer	65	28 km	2	62	36.4	44.0%	\$9,178,608	\$33,636,397
Water	65	45 km	5	102	43.8	32.6%	\$11,635,467	\$43,624,842
Total							\$42,106,090	\$134,486,593

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 2013, adjusted for an inflation rate of 62.5%.

Asset Management Planning for Environmental Services

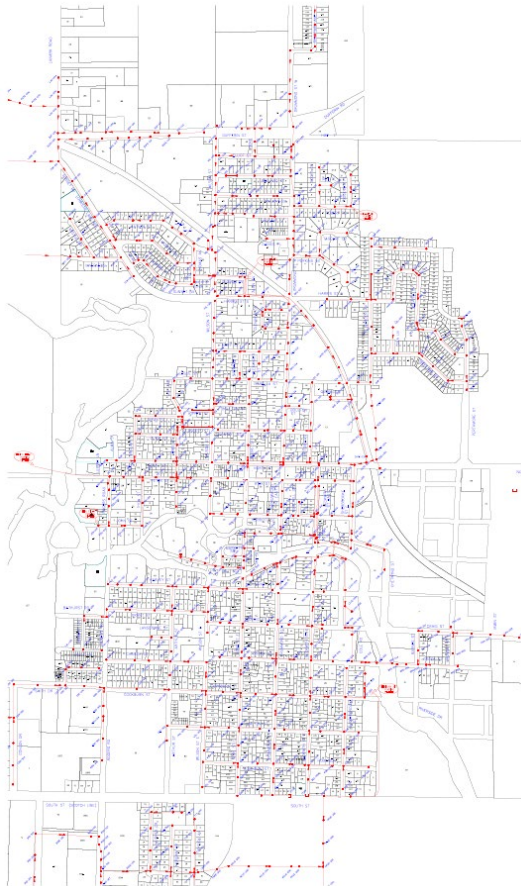
A. Overview of the Town's environmental services assets (continued)



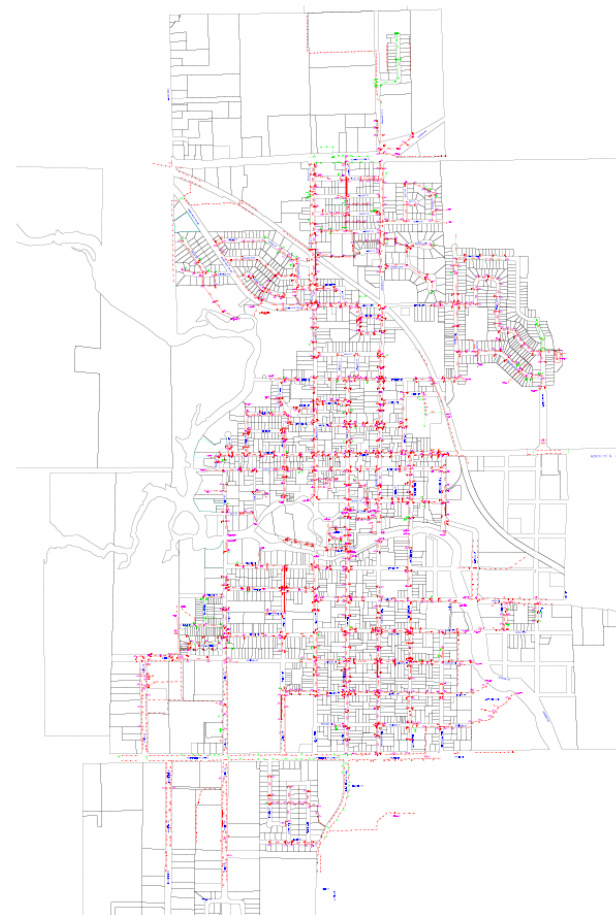
Asset Management Planning for Environmental Services

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 fair condition.

Condition Rating	Remaining Useful Life	Sanitary Sewer	Storm Sewer	Water
Very Good	More than 75%	12%	11%	9%
Good	50% to 75%	18%	21%	19%
Fair	25% to 49%	33%	51%	34%
Poor	10% to 25%	30%	15%	29%
Very Poor	Less than 10%	7%	2%	9%

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. 	The Town currently manages water systems to approximately 2,300 water accounts representing 99% of the 3395 households in the Town.
<ul style="list-style-type: none"> A description of the user groups or areas of the municipality that have fire flow. 	The Town has 234 fire hydrants. In 2018 and 2021, 230 hydrants were tested for fire flow.
<ul style="list-style-type: none"> A description of boil water advisories and service interruptions. 	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. 	The Town currently provides water services to approximately 2,300 accounts, representing 99% of total households within the Town.
<ul style="list-style-type: none"> The percentage of properties where fire flow is available. 	Fire flows are available to approximately 100% of households in the Town.
<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. 	The Town has not declared a boil water advisory in the past two years.
<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. 	Over the last two years, the Town has experienced two watermain breaks per year, representing as many as 4,600 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>	<p>The Town currently manages wastewater systems with approximately 2,300 wastewater customers.</p>
<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 have combined sewers on Mary Street only (2023 Construction). • Storm water can enter 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 uses a three (3) cell sewage lagoon system. Following treatment in lagoon network, flows are further treated in the SAGR system (2017), then discharged to the Tay 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. 	<p>The Town currently provides wastewater services to approximately 2,300 accounts, representing approximately 99% of total households within the Town.</p>
<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. 	<p>During the preceding two calendar years, the Town experienced zero overflows in combined sewers.</p>
<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. 	<p>The Town has had zero effluent violations per year due to wastewater discharge.</p>

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.
<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

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	\$55,000
40	Appurtenance replacement and swabbing	\$143,000
Total cost of lifecycle asset activities (excluding replacement)		\$198,000
Average cost per year		\$5,130
Number of kilometers of water mains (rounded)		34.8
Estimated annual cost of lifecycle activities (excluding end-of-life replacement requirements)		\$178,524

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	\$86,000
50	Replacement of 60% of structure	\$175,000
Total cost of lifecycle asset activities (excluding replacement)		\$261,000
Average cost per year		\$7,215
Number of kilometers of sanitary and storm mains (rounded)		76.9
Estimated annual cost of lifecycle activities (excluding end-of-life replacement requirements)		\$544,834

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 linear water assets reaching end of useful life over the next fourteen years which is based on the existing useful lives adopted for TCA reporting purposes, is \$58.5 million.

Year	Sanitary Sewer	Storm Sewer	Water	Total
2022	\$1,987,763	–	\$539,145	\$2,526,907
2023	\$196,826	–	\$239,787	\$436,613
2024	\$303,449	–	\$308,139	\$611,589
2025	\$159,590	\$119,740	\$140,697	\$420,028
2026	\$2,427,162	–	\$3,502,076	\$5,929,239
2027	\$262,737	\$434,809	\$380,857	\$1,078,404
2028	\$126,115	\$282,691	\$496,041	\$904,847
2029	–	\$694,458	-	\$694,458
2030	\$1,008,864	\$371,945	\$1,289,718	\$2,670,526
2031	\$1,819,745	\$1,126,577	\$1,285,268	\$4,231,590
2032	\$89,510	\$499,469	-	\$588,979
2033	\$837,365	\$233,462	-	\$1,070,828
2034	\$984,109	\$104,802	\$3,984,435	\$5,073,346
2035	\$19,117,426	\$1,214,767	\$12,031,797	\$32,363,993
Total	\$29,320,665	\$5,082,721	\$24,197,960	\$58,501,346

Corporation of the Town of Perth

Other Assets



Asset Management Planning for Buildings

A. Introduction

The Town's building inventory is comprised of approximately 19 facilities made up of municipal services, including parks and recreation, cultural services, emergency services, public works and administrative functions. Small storage buildings and sheds are not included in the count of facilities.

B. Condition Assessments

To assess facilities, a Facility Condition Index ('FCI') is recommended. FCI is a ratio of total deferred maintenance to the current replacement value of the facility. The index can be used to assess either individual assets or grouped assets. The FCI is currently accepted throughout North America.

At the present time, sufficient information concerning the deferred maintenance costs for the Town's facilities is not available. While a condition assessment can be estimated through an analysis of the remaining useful lives of the Town's facilities, this approach can be problematic as different components of buildings will have varying useful lives, resulting in a piecemeal approach to facility maintenance planning. At the same time, the Town has a number of major facilities that are approaching the end of their useful lives and could either be continued to be used (with or without repairs) or replaced, including the following:

Facility	Initial Construction Year	Current Age	Estimated Useful Life	Remaining Useful Life	Replacement Value
Community Centre	1964	58	50	–	\$38 million
Indoor Swimming Pool	1970	52	50	–	\$20 million
Works Garage	1965	57	50	–	\$3 million

In light of the above, we have not presented a summary of condition assessments for the Town's facilities.

Asset Management Planning for Buildings

C. Asset Management Strategies

Asset management activities for buildings will vary based on a number of factors, including the type of facility, its current condition, its intended use (residents vs. internal purposes) and the financial resources available to the Town.

<i>Anticipated asset life cycle.</i>	The life cycle for facility components will vary from 15 to 60 years. The actual life cycle of building components will vary based on the level of maintenance provided throughout their service lives.
<i>Integration opportunities</i>	Assets are typically approached separately with little to no integration of facilities. However, some municipalities have attempted to achieve economies of scale through (i) the consolidation of different types of facilities into one building (i.e. fire halls and public works depots); and/or (ii) the co-location of municipal operations with other public sector entities under shared service arrangements.
<i>Rehabilitation and replacement criteria</i>	To assess facilities, the Facility Condition Index (FCI) is recommended. FCI is a ratio of total deferred maintenance to the current replacement value of the facility. The index can be used to assess either individual assets or grouped assets. The FCI is currently accepted throughout North America.
<i>Rehabilitation and replacement strategies</i>	The replacement schedule will be dictated by the actual asset conditions at the time, the stage in its life cycle, and the FCI asset condition summaries. Replacement may also be undertaken to meet any changes in safety, industry or technological specifications and standards. The facility must also be maintained to meet the requirements of the Accessibility for Ontarians with Disabilities Act (AODA) and upgrade ingress/egress points as necessary. Critical components which should be given special attention with annual inspections include facility roof and HVAC systems. Any scheduled improvements should take into consideration the institution of economical energy efficient systems and equipment.
<i>Life cycle consequences</i>	Degradation of the building and its components are noticed by users, with associated increases in operational costs due to inefficiencies, increased maintenance costs or health and safety concerns. There may be significant challenges to operating in buildings that are in need of immediate attention, impacting a range of items such as the efficiency of staff deployment, energy costs, facility maintenance costs, customer service (e.g. the ability to offer 'one window' service, accessibility concerns) and potential health and safety issues caused by mould and other irritants.
<i>Integrated asset priorities</i>	The schedule of replacement is dependent on the facility's stage in its life cycle, the actual condition at the time, and the convenience of performing the replacement without disturbing the operations.

Asset Management Planning for Buildings

D. Overall Financial Requirements

The overall replacement cost of the Town's facilities in 2022 is estimated to be in the order of \$106 million.

	Number of Facilities			
	Number	Percentage		
Corporate (Town Hall, Works Garage)	2	11%		
Water Plant, 3 Pump Stations, Water Tower, Lagoon	6	32%		
Recreational (Pool, Arena, Museum, Crystal Palace, TOTT)	5	26%		
Fire Department	1	5%		
Other (Conlon Farm, LDP, Bandshell, Landfill Buildings)	5	26%		
Total	19	100.0%		

Three major facilities – Community Centre, Pool, and Garage – are approaching or are at the end of their useful lives. For the purposes of the asset management plan, we have assumed that the Town will:

- Replace the Community Centre, Pool, and Garage with new facilities (with an estimated combined cost of \$61.2 million); and perform other maintenance, repairs and replacements totalling \$13.7 million. Included in the \$13.7 million is \$3.2 million for the lagoon, \$6.0 million for the water plant and \$0.4 million for pump stations.

Asset Management Planning for Buildings

A. Introduction

The Town currently operates 138 facilities.

B. Capital Requirements.

It is expected that the capital requirements for buildings over the 14 year time period are as follows:

Year	Capital Requirements	Maintenance	Total
2022	–	\$1,125,653	\$1,125,653
2023	\$440,782	\$1,235,000	\$1,675,782
2024	\$956,409	\$526,806	\$1,483,215
2025	\$313,750	\$729,780	\$1,043,530
2026	\$80,400	\$935,455	\$1,015,855
2027	\$3,943,867	\$481,170	\$4,425,037
2028	\$1,213,206	\$607,867	\$1,821,073
2029	\$994,029	\$300,000	\$1,294,029
2030	\$21,204,090	\$480,151	\$21,684,241
2031	\$60,279	–	\$60,279
2032	–	–	–
2033	–	–	–
2034	\$20,199	–	\$20,199
2035	\$37,890,000	–	\$37,890,000
Total	\$67,117,011	\$6,421,882	\$73,538,893

Asset Management Planning for Vehicle Fleet and Equipment

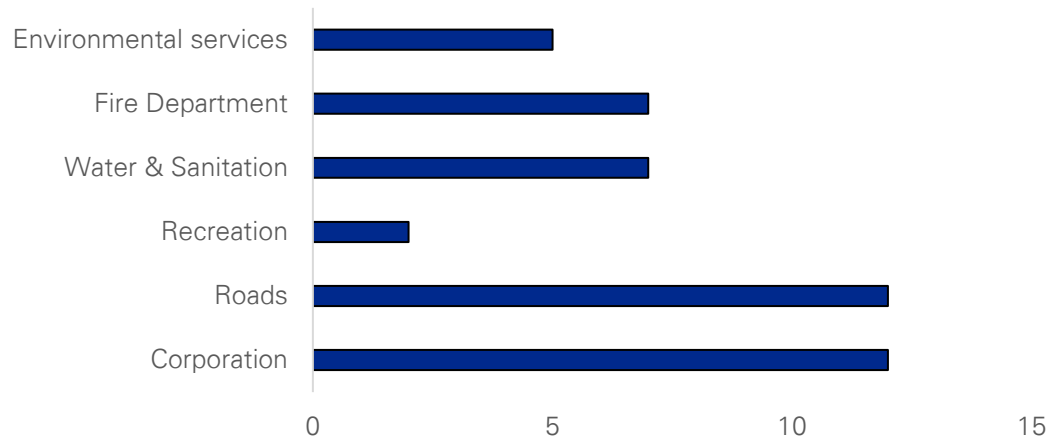
A. Introduction

The Town's current vehicle fleet is comprised of approximately 45 vehicles consisting of vehicles for fire, public works, and maintenance. The town's equipment consists of over 100 pieces of equipment required to support many of the Town's services, from recreation to public works and maintenance.

B. Condition Assessments

For the purposes of assessing the condition of the Town's fleet and equipment, we have rated the vehicles as being in either good, fair or poor condition, based on the percentage of the vehicles remaining useful life. As summarized below, 42% of the Town's fleet is considered to be in poor condition, which reflects a number of vehicles that continue to be in use beyond their expected useful lives.

Town's Fleet by Department



Condition Rating	Remaining Useful Life	Number of Vehicles/equipment	Percentage of Total Fleet
Good	More than 50%	68	46.3%
Fair	10% to 49%	35	23.8%
Poor	Less than 10%	44	29.9%
Total		147	100.0%

Asset Management Planning for Fleet

C. Asset Management Strategies

Asset management activities for vehicles and moveable equipment will vary based on a number of factors, including the type of vehicle, its current condition, and the financial resources available to the Municipality. A summary of the asset management strategy for vehicles and moveable equipment is included below.

<i>Anticipated asset life cycle.</i>	Service life is dependent on the type of vehicle and service area and will range from 10 to 25 years.
<i>Integration opportunities</i>	Assets are typically approached separately with little to no integration of vehicles. However, operational changes, including modifications to service levels, the use of external vs. internal resources, changing regulatory requirements and other considerations can impact on fleet replacement.
<i>Rehabilitation and replacement criteria</i>	Replacement of fleet should be dictated by the results of lifecycle cost analysis considering the operating costs of continuing to own the vehicle (repairs, insurance, fuel, depreciation, and downtime costs) vs. the operating and acquisition costs of a new vehicle.
<i>Rehabilitation and replacement strategies</i>	Rehabilitation and replacement strategies are per the Town's Vehicle Management Policy.
<i>Life cycle consequences</i>	Vehicles/equipment that are not maintained, or as assets reach the end of the service lives, the efficiency of the assets decrease, seeing an increase in cost per km/use. In the event of service interruption, work force costs are increased due to extended work schedules. In addition, failure of critical vehicles and equipment (e.g. fire, winter roads maintenance) may result of public safety risks and potential regulatory risk if the municipality does not meet minimum maintenance standards.
<i>Integrated asset priorities</i>	Not applicable.

Asset Management Planning for Fleet

D. Overall Financial Requirements

The Town's fleet has an estimated replacement value in 2022 of \$4.7 million. Based on the estimated useful lives of the Town's vehicles and moveable equipment, \$5.2 million should be expended during the next fourteen years. Replacement will be in accordance with the Town's Vehicle Management Policy.

The lifespan of vehicles and moveable equipment is between 10 and 25 years with an average age of 12.4 years as of 2022.

Due to the current shortages of some vehicles, estimated delivery times may be longer than originally estimated and costs may be higher due to the impacts of inflation over a longer period of time.

Asset Management Planning for Vehicle and Equipment

A. Introduction

The Town currently has 45 vehicles and over 100 pieces of equipment.

B. Capital Requirements.

It is expected that the capital requirements for Vehicle and Equipment over the 14 year time period are as follows:

Year	Capital Requirements
2022	865,730
2023	299,543
2024	571,172
2025	208,903
2026	850,515
2027	342,718
2028	525,599
2029	1,983,804
2030	1,152,161
2031	500,875
2032	219,118
2033	205,833
2034	837,162
2035	-
Total	\$8,563,134

Note: No large vehicle or equipment maintenance is planned to occur during the next 14 years.

Asset Management Planning for Landfills

A. Introduction

The Town currently operates one landfill site.

B. Capital Requirements.

It is expected that the capital requirements for the landfill over the 14 year time period are as follows:

Year	Capital Requirements	Maintenance	Total
2022	\$631,573	–	\$631,573
2023	\$75,722	–	\$75,722
2024	\$77,267	–	\$77,267
2025	\$78,846	–	\$78,846
2026	–	–	–
2027	–	–	–
2028	–	–	–
2029	–	–	–
2030	–	–	–
2031	–	–	–
2032	–	–	–
2033	–	–	–
2034	\$679,658	\$86,065	\$765,723
2035	–	\$86,065	\$86,065
Total	\$1,543,066	\$172,130	\$1,715,196

Asset Management Planning for Landfills

C. Asset Management Strategies

The Environmental Protection Act sets out the regulatory requirements to properly close and maintain all active and inactive landfill sites. Under environmental law, there is a requirement for closure and post-closure care of solid waste landfill sites. Landfill closure and post-closure care requirements have been defined in accordance with industry standards and include final covering and landscaping of the landfill, pumping of ground water and leachates from the site, and ongoing environmental monitoring, site inspection and maintenance.

D. Overall Financial Requirements

The Town currently has one active site. The site is in operation and is currently undergoing an expansion in capacity that provides an estimated life to approximately 2033 . The Net Present Value of the costs to finish the site as well as the closure and post-closure costs is \$1,344,000 (using a 6% discount rate).

Corporation of the Town of Perth

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 infrastructure every five years, with the next update expected in 2026;
- 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.

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