



INNSERVICES UTILITIES INC.

WATER NETWORK ASSET MANAGEMENT PLAN 2022



VERSION HISTORY

Version	Date	Description
1.0	May 19, 2022	Board Approval
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EXECUTIVE SUMMARY

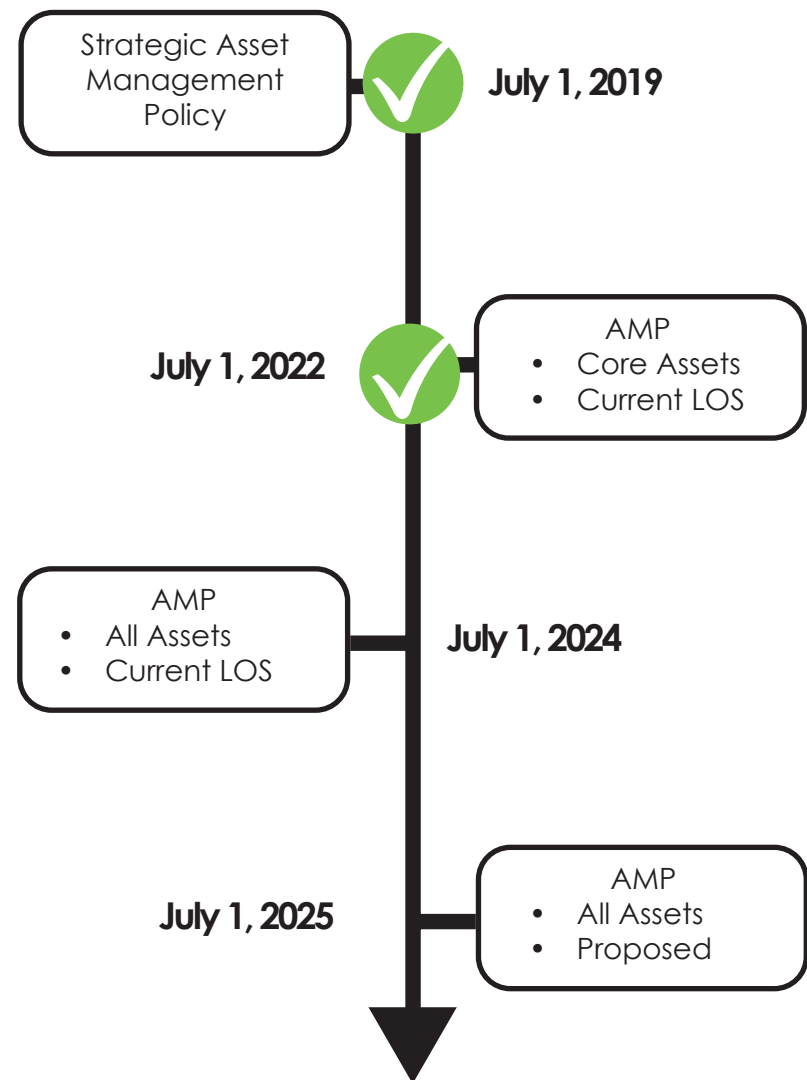
InnServices owns and manages a large range of water assets on the behalf of our community. These assets provide services that are to be managed in a cost-effective way, while ensuring they continue to meet the needs of the community now and in the future.

The Water Network Asset Management Plan (AMP) focuses on InnServices' water assets and specifies the requirements for effective management of the assets and their corresponding financial implications. Water assets include water mains, water valves, hydrants, water services, fleet, and water facility assets. These assets are responsible for the delivery of potable water services provided by InnServices.

InnServices is committed to public transparency and open communication. In this spirit, and in compliance with O. Reg. 588/17, the AMP will be accessible through the InnServices' website. Background information and reports used in the preparation of this plan will also be made available publicly upon request.

To ensure the AMP is current and meeting the legislative requirements an updated plan will be completed every two years to ensure an accurate representation of data is provided to the community. The information and figures within the AMP have been developed based on the best available data at the time of the plan's development. The AMP will assist InnServices to make appropriate decisions regarding the acquisition, operation maintenance, renewal, and disposal of water infrastructure assets.

Figure 1: O. Reg. 588/17 Timeline



INTRODUCTION

In 2015, the Ontario government introduced the Infrastructure for Jobs and Prosperity Act. The purpose of this Act is to establish mechanisms to encourage principled, evidence-based, and strategic long-term infrastructure planning that supports job creation and training opportunities, economic growth and protection of the environment, and that incorporates design excellence into infrastructure planning.

Under this Act, the Ontario government also introduced Ontario Regulation 588/17: Asset Management Planning for Municipal Infrastructure. This regulation requires that every municipality shall prepare an AMP in respect of its core municipal infrastructure assets by July 1, 2022. The Regulation further defines core municipal infrastructure assets to include roads, bridges, and structural culverts (i.e., transportation), stormwater assets, water and wastewater assets.

The AMP has, in part, been prepared to meet the 2022 regulatory requirements of O. Reg 588/17. Any gaps or weaknesses in compliance are addressed in the Monitoring & Improvement section of the AMP.

The Water Network is a component of InnServices' core infrastructure assets. Water assets provide valuable services to the public, such as safe drinking water. Effective maintenance and renewal of these assets is crucial to ensure that they continue to deliver adequate levels of service and provide benefits to current and future generations.

The AMP demonstrates InnServices' responsible and systematic approach to asset management, compliance with regulatory requirements and commitment to fulfilling the following objectives of the Community Strategic Plan:



- Plan for and Manage Growth
- Improve Service Offerings
- Maintain and Protect Existing Infrastructure
- Ensure Financial Stability

The AMP achieves this outcome by delivering on the following key elements of effective asset management planning:

- Developing and maintaining a complete and accurate database of inventory and state of infrastructure information.
- Defining levels of service that consider the public's expectations and meet strategic needs of InnServices.
- Employing a lifecycle approach.
- Reviewing current and future demands.
- Managing risks associated with the assets and the services they provide.
- Ensuring continuous improvement in the asset management practice and plans.

The reader will further benefit by consulting the following documentation:

- The Official Plan (Our Place)
- Master Servicing Plan
- Water & Wastewater Rates Study

FREQUENTLY ASKED QUESTIONS

What is an asset?

An asset is an item of property owned and maintained by InnServices that is deemed to have a value over a specified threshold. InnServices' assets include a variety of water network assets alongside most assets that are housed in facilities operated & maintained by InnServices.

What is an asset category?

An asset category refers to a set of assets that have similar characteristics or functionality. For example "water network" asset types include water mains, hydrants, hydrant leads, water valves, valve chambers, water laterals, facility assets and fleet.

What are the objectives of asset management?

The objectives of asset management are to intervene at strategic points in an asset's lifecycle to extend the expected service life, and thereby maintaining its performance. When maintenance activities are scheduled strategically it helps to decrease costs, rather than the increased costs of unplanned maintenance or excessive planned maintenance.

What is an Asset Management Plan?

An Asset Management Plan (AMP) is a strategic document that provides summary level information about the quantity, quality, average age, and replacement value for a particular asset category. It identifies the level of service delivered by the assets and the lifecycle activities required to maintain the assets in a condition that will adequately support this deliverable. Finally, the plan provides a summary of the required investment over the next 10 years.

Why does InnServices need an AMP?

Under the Infrastructure for Jobs and Prosperity Act, 2015, and Ontario Regulation 588/17: Asset Management Planning for Municipal Infrastructure, each municipality in Ontario has a legislative requirement to develop and maintain AMP's. In addition to the legislative requirement, InnServices benefits from maintaining an effective AMP to help ensure that limited resources are being invested effectively in the assets that need it the most to ensure the ongoing delivery of services.

How does InnServices include community feedback into the Plan?

InnServices would provide opportunities for community engagement in asset management planning. InnServices will provide information on the corporate website to facilitate transparency in Asset Management Planning.



DEFINITIONS & ACRONYMS

Core Asset: As per O. Reg. 588/17, Water Assets, Wastewater Assets, Stormwater Management Assets, Roads and Bridges/ Culverts are considered as core assets.

Water Assets: Water assets that relate to the collection, production, treatment, storage, supply or distribution of water.

Replacement Value: The cost in 2021 dollars to rebuild the entire asset regardless of maintenance/rehabilitation strategies. It is assumed as a complete new build of the asset, not including the land acquisition cost.

Expected Useful Life: The length of time that assets are designed to provide safe, reliable, and useful service.

Average Asset Age: The age of the asset since the construction date. As each asset class has various components, the average asset age is used.

Remaining Service Life: The estimated remaining useful life of the asset based on age only.

New Acquisitions: The planned construction of new assets that are not to replace the existing infrastructure.

Asset Performance: The manner in which or the efficiency with which an asset fulfills its intended purpose.

Lifecycle Activity: 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.

Renewal: The asset to be replaced or restored to an excellent state as if had become new again.

Lifecycle Cost: The cost of activities undertaken with respect to a municipal asset over its service life including reconstructing, maintaining, renewing, operating and decommissioning including associated design and engineering fees.

Connection-days: The number of properties connected to a municipal system that are affected by a service issue, multiplied by the number of days on which those properties are affected by the service issue.

Average Risk Rating: Risk ratings weighted by costs and averaged to determine the overall risk of an individual asset category.

Acronyms:

AMP = Asset Management Plan

LOS = Levels of Service

CPI = Construction Price Index

CVOR = Commercial Vehicle Operators Registration

ECA = Environmental Compliance Approval

CI = Continuous Improvement

PDCA = Plan-Do-Check-Act

DWQMS = Drinking Water Quality Management Standard

MCR = Municipal Comprehensive Review

MSP = Master Servicing Plan

O. Reg = Ontario Regulation

ASSET HIERARCHY

Asset Hierarchy

InnServices has adopted an asset hierarchy approach to develop the framework for categorizing the asset portfolio into the appropriate linkages between the assets. The asset hierarchy in the AMP is illustrated as parent-child type relationship, with 4 levels:

- Level 1: Service
- Level 2: Major Group
- Level 3: Segment
- Level 4: Data

Below is the detailed asset hierarchy of Water Network assets:

Table 1: Water Network Asset Hierarchy

Level 1	Level 2	Level 3	Level 4
Water Network	Water Linear Assets	Watermains	Type, Size, Material
		Water Laterals	Type, Size, Material
		Water Valves	Type, Size
		Hydrants	Purpose, Size
		Hydrant Leads	Type, Size, Material
		Valve Chambers	Type, Size
	Water Facility Assets	Water Treatment Plant	Process Area, Component
		Pumping Stations & Well Houses	Process Area, Component
		Reservoirs & Standpipes	Component
		Process & Yard Piping	Component
		Equipment & Furnishings	Component
		Services	Component
		Pumps & Motors	Component
		Miscellaneous Assets	Component
	Land Improvements	Component	
Water Fleet Assets	Vehicles & Trailers	Type	

STATE OF INFRASTRUCTURE

The State of Infrastructure section provides summary level information about Innservices' Water Network assets, which includes:


- Water Linear assets
- Water Facility assets
- Water Fleet assets

In compliance with O. Reg. 588/17, the following information is provided for each asset type:


- Inventory (quantity)
- Replacement value
- Expected Life, average age, and service life remaining
- Average condition

This information provides the foundation to the InnServices AMP, as having a complete and current understanding of the state of infrastructure is critical for efficient and effective lifecycle management and financial planning.


The following icons are used throughout the AMP to identify the asset types:



Water
Linear Assets



Water
Facility Assets



Water
Fleet Assets

Table 2: Water Linear Assets Summary



Asset Type	Asset Sub-Types	Quantity	Replacement Value	Average Age	Average Condition
	Valve Chambers	96	\$483.5 million	18.9 years	
	Hydrant Leads	3.7 km			
	Hydrants	1357			
	Water Valves	15071			
	Water Laterals	115.8 km			
	Watermains	219.6 km			

Table 3: Water Facility Assets Summary




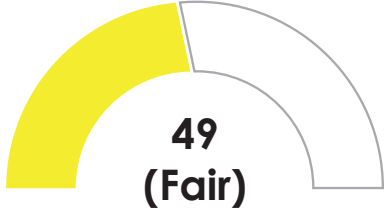
Asset Type	Asset Sub-Types	Quantity	Replacement Value	Average Age	Average Condition
	Land Improvements	19	\$158.2 million	16.8 years	
	Miscellaneous	11			
	Pumps & Motors	70			
	Services	27			
	Process & Yard Piping	36			
	Reservoirs & Standpipes	15			
	Pumping Stations & Well Houses	14			
	Equipment & Furnishings	201			
	Lakeshore WTP	1			

Table 4: Water Fleet Assets Summary

Asset Type	Asset Sub-Types	Quantity	Replacement Value	Average Age	Average Condition
	Vehicles & Trailers	13	\$787.2 thousand	5.9 years	

Water Network Inventory

Asset inventory was determined through the review of data in the 2021 Tangible Capital Assets (TCA) File and cross referenced through data within the County of Simcoe's Geographic Information System (GIS) database. InnServices' TCA and GIS database are updated frequently to ensure all assets are kept current and information is available to staff. Table 1 summarizes InnServices' Water Network asset hierarchy, with asset sub-types and data available.

Water Linear assets are classified into six (6) sub-types:

- **Valve Chambers** - A concrete chamber used to house pumps or valves, accessible through a surface maintenance hole.
- **Hydrant Leads** - Connecting pipe between water main and a hydrant. Standardized in size and material.
- **Hydrants** - An above ground fixture connected to the water main through a hydrant lead. Typically used for fighting fires and flushing.
- **Water Laterals** - The water service line that provides water from the water main to a property.
- **Water Valves** - A fitting onto water mains and hydrant leads that allows to control the flow of water through the pipe.
- **Water Mains** - Pipeline laid within the public right of way, used to transport potable water to the community & hydrants.

Water Facility assets are classified into nine (9) sub-types:

- **Water Treatment Plant**: A compound facility designed to use physical and chemical processes to improve water quality to meet the regulatory requirements.
- **Pumping Stations & Well Houses** - Pumping station is defined as a facility of pumps housed in a building designed to boost water pressure from one place to another. Well house is a small building that collects raw well water and provides treatments before being distributed to the community.
- **Reservoir & Standpipes** - Reservoir is a structure designed to store water. Standpipe is a type of reservoir consisting of a vertical ground level storage tank to store water.
- **Process & Yard Piping** - Any water main, lateral, valves, or fittings installed within the facilities for the treatment and distribution of water.
- **Equipment & Furnishing** - It includes frequency drives, lifting equipment, cameras, portable radios, shelving, cabinets contained in the InnServices' facilities.
- **Services** - A grouping that includes facility related assets such as HVAC and motor control systems.
- **Pumps & Motors** - A class that groups all mechanical pumps and motors within the InnServices' facilities.
- **Miscellaneous Assets** - These assets are the facility assets which do not follow any particular asset grouping.
- **Land Improvements** - Land Improvements include assets such as fences, walkways, parking lots, and outdoor lighting.

Water Fleet assets are classified into one (1) sub-type:

- **Vehicles & Trailers** - Assets used to transport people or goods related to water activities or management.

Replacement Value - Water Linear Assets

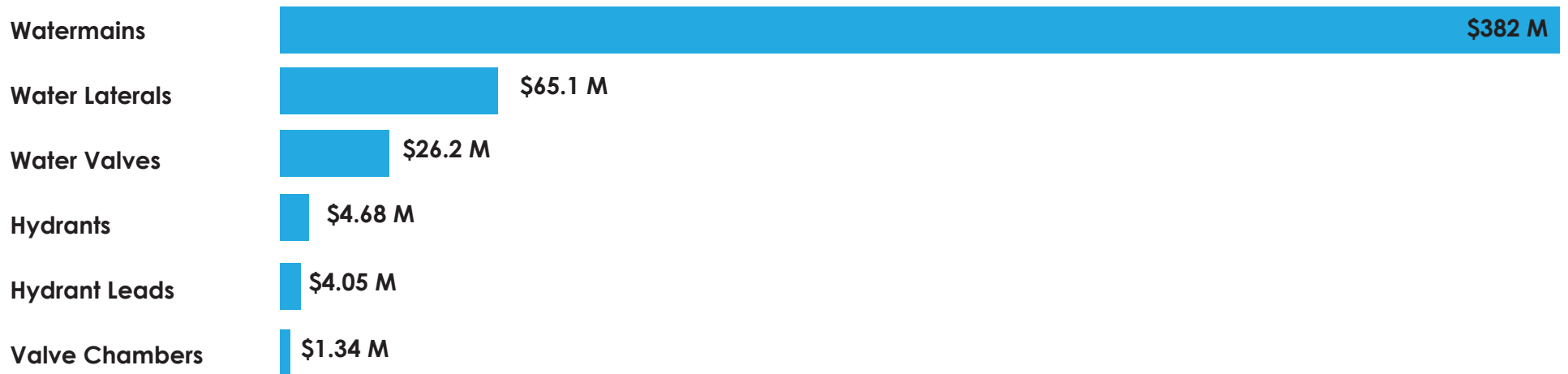
Asset replacement value is determined by estimating the total replacement value of the assets within each asset class. All Water network assets analyzed in the AMP have a total replacement value of \$642.6 million. The replacement value of the Water Linear and Water Fleet assets is estimated by using the Cost/Unit method. However, Construction Price Index (CPI) Method is used to estimate the replacement value of the water facility assets.

Cost/Unit: Based on the current capital projects, the cost/unit is estimated for the linear infrastructure including the asset removal costs, site work, material costs and engineering contingencies.

CPI (Construction Price Index) Method: Replacement cost of the facility assets is estimated by inflating the historical costs using Non-Residential Building Construction Price Indices (NRBCPI) to reflect an assets replacement value in today's dollar (2021).

The distribution of the Water Linear replacement value is predominantly in Watermains. Figure 2 displays the total replacement value of Water Linear Assets.

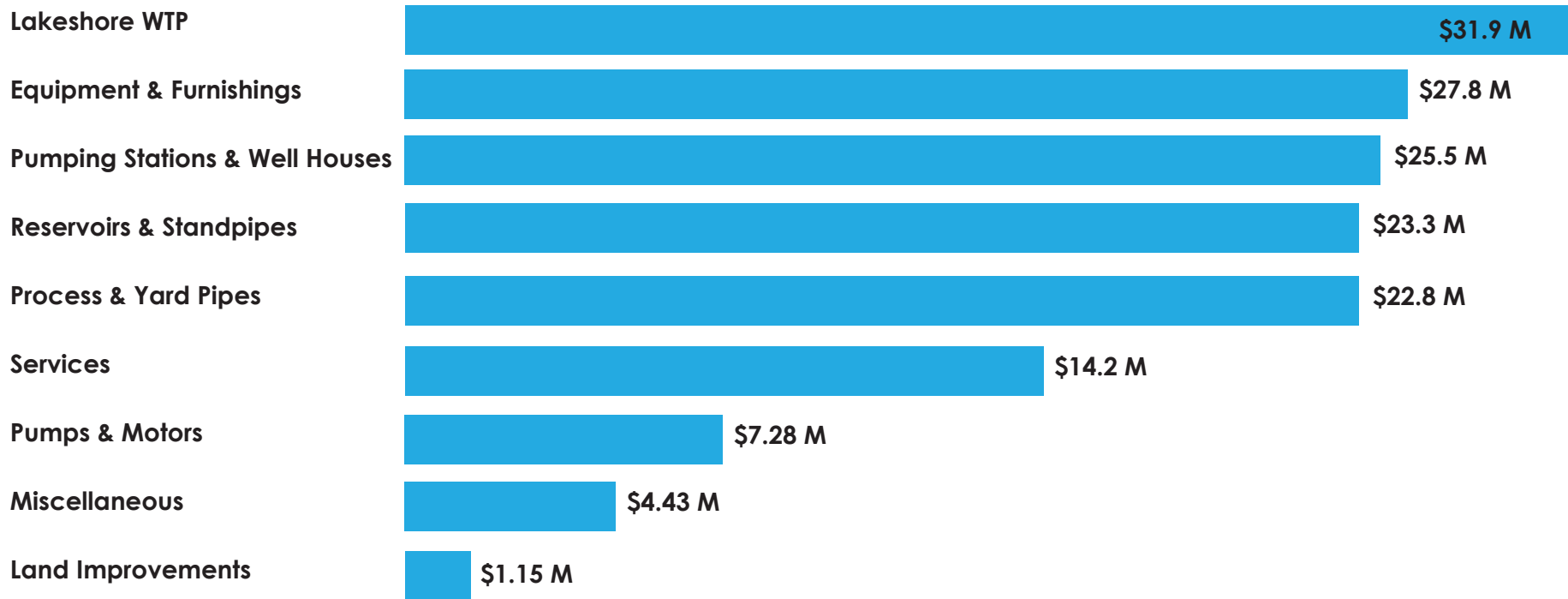
Figure 2: Replacement Value of Water Linear Assets:



Replacement Value - Water Facility Assets

Water Facility assets analyzed in the AMP have a total replacement value of \$158.3 million. Figure 3 displays the total replacement value of each asset class. As per the asset hierarchy approach, the Water Facility assets are broken down into nine (9) segments as shown in Figure 3.

Figure 3: Replacement Value of Water Facility Assets



The distribution of the water network replacement value is predominantly in water mains and water facility assets. The replacement value of the water network assets are with respect to 2021. Replacement value within the AMP should be reviewed periodically and revised as needed for more accurate capital projections.

Replacement Value - Water Fleet Assets

Water Fleet assets analyzed in the AMP have a total replacement value of \$0.79 million. The replacement value of Water Fleet assets is estimated using the Cost/Unit method and is displayed in Figure 4.

Figure 4: Replacement Value of Water Fleet Assets



Expected Life

The expected life of assets is the length of time that assets are designed to provide safe, reliable, and useful service. In many cases, the service life of an asset can be extended well beyond the original expected life with proactive lifecycle management. However, the cost of ownership generally increases as the condition deteriorates and the frequency and costs of repairs increase.

Average Age

The average age is estimated as of 2021 by analyzing the in-service year data and the expected useful life.

Service Life Remaining

Service life remaining represents the difference between the expected useful life and average age. The assets within each asset class are weighted with respect to replacement value to estimate the average age and average service life remaining. Table 5, 6, and 7 provides a summary of expected life, average age, and service life remaining of the InnServices' Water Network assets.

Table 5: Expected Life, Average Age and Servicing Life Remaining - Water Linear Assets


Asset Type	Asset Sub-Types	Expected Life (Years)	Average Age (Years)	Service Life Remaining (Years)
	Valve Chambers	75	15.3	59.8
	Hydrant Leads	80	17.4	62.6
	Hydrants	50	18.1	31.9
	Water Valves	75	18.4	56.6
	Water Laterals	75	19.2	55.8
	Watermains	60-90	19.0	68.5

Table 6: Expected Life, Average Age and Servicing Life Remaining - Water Facility Assets



Asset Type	Asset Sub-Types	Expected Life (Years)	Average Age (Years)	Service Life Remaining (Years)
	Land Improvements	20-75	13.1	15.8
	Miscellaneous	40	39.1	4.7
	Pumps & Motors	10-30	8.1	20.3
	Services	20-35	14.4	18.7
	Process & Yard Piping	50-75	19.0	52.1
	Reservoirs & Standpipes	75-100	18.3	71.5
	Pumping Stations & Well Houses	75	25.5	49.5
	Equipment & Furnishings	4-75	11.0	18.2
	Lakeshore WTP	20-75	12.8	45.9

Table 7: Expected Life, Average Age and Servicing Life Remaining - Water Fleet Assets

Asset Type	Asset Sub-Types	Expected Life (Years)	Average Age (Years)	Service Life Remaining (Years)
	Vehicles & Trailers	10-15	5.9	5.1



Condition

The assessed condition data allows InnServices to more confidently determine the remaining service life of the assets and help identify the infrastructure needs to maximize an asset's useful life while lowering the total lifecycle costs.

InnServices conducts condition assessments as on need basis for the critical assets. Due to the unavailability of the assessed condition of the infrastructure, age-based estimates are used to project the current condition of assets through lifecycle modelling. The modelling approach uses standardized deterioration curves and assigns a condition, based on the percentage of expected life remaining.

For the AMP, a five-level condition rating approach was used with each condition rating being of equal range. Descriptions of the different condition ratings used for the AMP is shown in the Table 8.

Assessed condition data is invaluable in asset management planning as it reflects the true condition of an asset. Due to the unavailability of assessed condition data, age-based estimates are used to determine the condition. The average condition of the water network assets is 75.

Figure 5: Condition of Water Network

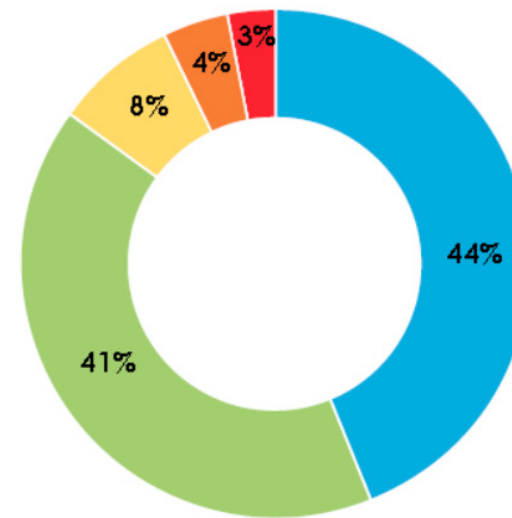



Table 8: Condition Assessment Descriptions

Condition Index	Condition Description
80-100 Excellent	The asset is fit for the future. It is well maintained, in good condition, new or recently rehabilitated.
60-79 Good	The asset is adequate. It is acceptable and generally approaching the mid-stage of its expected service life.
40-59 Fair	The asset requires attention. The asset shows signs of deterioration and some elements exhibit deficiencies.
20-39 Poor	There is an increasing potential for its condition to affect the service it provides. The asset is approaching the end of its service life, and a large portion of the system exhibits significant deterioration.
0-19 Very Poor	The asset is unfit for sustained service. It is near or beyond its expected service life and shows widespread signs of advanced deterioration.

Water Linear Assets Condition

Table 9 shows the asset class condition ratings determined through the age-based estimates of each asset type. Overall, 90% of water linear assets are in good or excellent condition, whereas, 4% of assets are in poor or very poor condition. The percentage of assets in a particular condition are weighted with respect to their replacement value.

Table 9: Water Linear Assets - Condition Summary











Asset Type	Asset Sub-Types	Average Condition	Condition Summary				
	Valve Chambers	80	41%	57%	2%		
	Hydrant Leads	78	51%	37%	9%	3%	
	Hydrants	64	39%	15%	28%	14%	4%
	Water Valves	75	44%	41%	10%	5%	
	Water Laterals	76	45%	44%	5%	6%	
	Watermains	78	45%	46%	5%	4%	

90% of Water Linear assets are in good or excellent condition

Water Facility Assets Condition

Water Facility assets are further broken down into more detailed segments as shown in Table 10. The majority of Water Facility assets are in good condition with an average condition rating of 69, whereas, 14% of assets are in poor or very poor condition.

Table 10: Water Facility Assets - Condition

Asset Type	Asset Sub-Types	Average Condition	Condition Summary
	Land Improvements	56	
	Miscellaneous	12	
	Pumps & Motors	72	
	Services	59	
	Process & Yard Piping	74	
	Reservoirs & Standpipes	80	
	Pumping Stations & Well Houses	66	
	Equipment & Furnishings	61	
	Lakeshore WTP	81	

Water Facility assets are mostly in good condition with an average rating of 69.

Water Fleet Assets Condition

Water Fleet assets are further broken down into more detailed segments in Table 11. 48% of Water Fleet assets are in good or excellent condition, whereas, 52% of assets are in poor or very poor condition.

Table 11: Water Fleet Assets - Condition Summary

Asset Type	Asset Sub-Types	Average Condition	Condition Summary
	Vehicles & Trailers	49	

48% of Water Fleet assets are in good or excellent condition.

LEVELS OF SERVICE

Levels of Service (LOS) describe the quantity and performance of services that assets should support during their service life. They provide a direct link between Innisfil's strategic objectives, the public's service expectations and the measured performance of the delivered service and enable a greater understanding of the cost-benefit implications of adjusting the services provided.

To be effective, LOS must be documented in ways that are meaningful to both the customers using the service and to the municipal staff that are delivering the services and managing the infrastructure that underlies the service. To ensure effectiveness, three types of LOS have been defined below:

Strategic

A qualitative statement that describes the primary service delivery objective and links directly with one or more objectives of Innisfil's Community Strategic Plan.

Community

Simple qualitative descriptions, in non-technical terms, or images that describe the public's perception or understanding of a service.

Technical

Quantitative metrics that enable staff to measure, track and report on various service attributes such as scope, quality and reliability.

The specific LOS defined by InnServices are summarized in the following tables. These will be used to:

- Identify LOS that service recipients can expect to receive and InnServices current performance in meeting these.
- Identify assets that require attention to ensure that LOS can be delivered and maintained.
- Enable Staff and InnServices' Board to discuss and assess the suitability, affordability and equality of the existing service levels and to determine the effect of increasing or decreasing this level over time.


It should be noted that the included Community and Technical LOS exceed the current LOS requirements of O. Reg. 588/17.



Strategic LOS

Strategic LOS performance measures are aligned with Innisfil's strategic goals and objectives in the Community Strategic Plan, Innovate Innisfil 2030. InnServices relies on the Town's community strategic plan. For InnServices' asset categories, strategic levels of service are summarized in the following table:

Table 12: Strategic LOS

Performance Measure	Strategic Objective Supported
Provide safe drinking water as per the requirements of the Drinking Water Quality Management Standard (DWQMS).	 <ul style="list-style-type: none"> <li data-bbox="1045 412 1524 448">1.1 Plan for and manage growth <li data-bbox="1045 483 1549 519">2.2 Enhance movement of people <li data-bbox="1045 555 1717 591">3.1 Maintain and protect existing infrastructure <li data-bbox="1045 591 1465 626">3.3 Ensure fiscal responsibility

Community LOS

Community LOS performance measures are designed to help the community better understand the services they are receiving and how varying levels of service will impact their service experience. Where possible, images are used to further enhance this understanding.

For this version of the AMP, compliance with O. Reg. 588/17 has been the driving force for defining Community LOS. As such, the service attributes for water infrastructure are taken directly from the regulation.

Table 13: Community LOS

Service Attribute	Community LOS (Qualitative Descriptions)	Current LOS
Scope	Description, which may include maps, of the user groups or areas of the municipality that are connected to the municipal water system.	Appendix A - Levels of Service Maps
	Description, which may include maps, of the user groups or areas of the municipality that have fire flow.	Appendix A - Levels of Service Maps
Reliability	Description of boil-water advisories and service interruptions.	InnServices does not have any boil water advisories.

Technical LOS

Technical LOS are designed to translate Community LOS into quantitative performance measures, and results that can assist staff responsible for delivering the services and supporting the assets that fulfill the Community LOS.

Compliance with O. Reg. 588/17 is the driving force for defining Technical LOS. All service attributes and performance measures defined for the assets in the regulation have been included. InnServices has defined a few technical LOS under the performance service attribute which is not mandated by O. Reg. 588/17.

Table 14: Technical LOS

Service Attribute	Performance Measure	Current Performance
Scope	Percentage of properties connected to the municipal water system.	75%
	Percentage of properties where fire flow is available.	100%
Reliability	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.	Not Applicable
	The number of connection-days per year due to water main breaks compared to the total number of properties connected to the municipal water system.	0
Performance	Actual Reinvestment Rate.	0.59%
	Percentage of assets in 'Good' or 'Excellent' condition.	85%
	Percentage of assets in 'Poor' or 'Very Poor' condition.	6.45%
	Average risk rating associated to the water network.	4.19



RISK MANAGEMENT

In the context of municipal asset management, a risk is an event that, if it occurred, would have an undesirable effect on the delivery of service. Risk can be defined as the product of the likelihood and impact of the event:

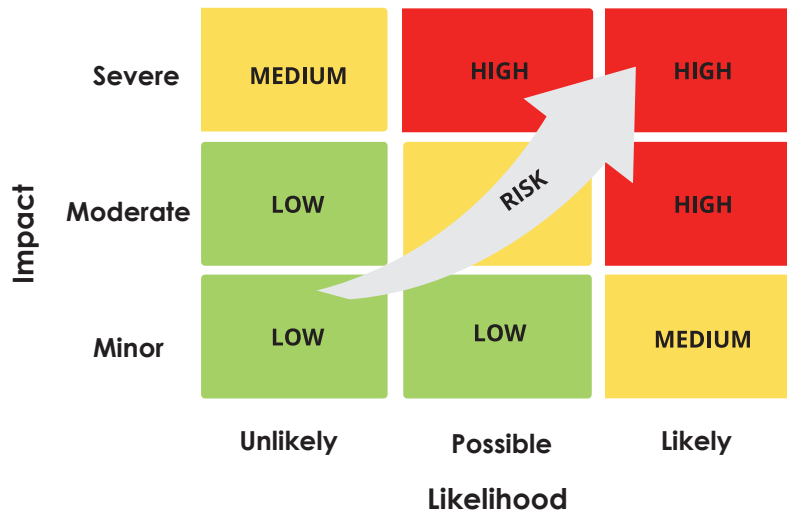
 **Risk = Likelihood x Impact**

Likelihood - measures the probability of the event occurring.

Impact - measures the severity of the consequence.

As illustrated in Figure 6, risk increases as the likelihood and/or impact of an event increases.

Figure 6: Risk Matrix



Managing Risk

Risk is managed through a process of identification, assessment, treatment, and monitoring to ensure that InnServices' is adequately prepared for what events may happen and have plans in place to react to events appropriately. This process is outlined in Figure 7 below, with descriptions to follow.

Figure 7: Risk Management Process



1. Identification

Write down all the threats and risks you can think of and ask for ones from other stakeholders.

2. Assessment

Evaluate each risk by determining the likelihood of it happening and the level of impact it would have.

3. Treatment

Implement process changes to reduce the impact of each risk and a response plan for if it happens.

4. Monitoring

Review the progress of the plan and ensure assessments and treatments are adequately addressing identified risks.

Identifying Risks

Risks are identified through a number of data sources, including:

- Routine inspections
- Reports and customer service requests
- Information obtained from past incidents
- Advice from professional bodies
- Past experience of InnServices staff

Once risks have been identified, assessed and assigned a risk rating, a treatment plan needs to be determined. The choice of treatment depends on the level of risk that can reasonably be managed and accepted by InnServices (i.e. the risk tolerance). Risk tolerance is informed not just by the likelihood and impact of the risk event, but also the cost of treatment and the urgency of the risk in comparison to other priorities.

Depending on the nature of the risk event and the level of risk tolerance, treatment can include:

- ⊗ Elimination – process of removing the risk event entirely.
- Mitigation – process of reducing the likelihood and/or impact of the risk event.
- ✓ Acceptance – process of retaining the risk as is.

In Table 15 below, InnServices has identified a number of risks associated with Water Network assets to demonstrate the application of the risk management methodology.



Table 15: Sample Risks - Water Network Assets

Risk	Likelihood	Impact	Risk Rating	Treatment
Risk of watermain breaks	Possible	Moderate	Medium	Accept and resolve as reported
Risk of service disruptions	Unlikely	Severe	Medium	Accept and resolve as reported
Minor damage due to accident, vandalism, weather, etc.	Possible	Minor	Low	Accept
Moderate damage due to accident, vandalism, weather, etc.	Possible	Moderate	Medium	Accept
Severe damage due to accident, vandalism, weather, etc.	Possible	Severe	High	Accept
Premature failure of facility assets such as equipments, valves	Possible	Severe	High	Accept and resolve as reported
Risk of water laterals freezing	Unlikely	Moderate	Low	Mitigate through frequent inspection and maintenance
Risk of hydrant freezing	Unlikely	Moderate	Low	Mitigate through frequent inspection and maintenance

FUTURE DEMAND

Demand Forecast

Per the 2021 census, the Town of Innisfil has a population of approximately 43,326 people. This is forecast to increase to 54,970 by 2031. This includes roughly 420 new housing units per year which will require the acquisition of new infrastructure assets to ensure that service levels are maintained.

Future Growth

As we look towards the future of growth, it is important that we align Asset Management Planning with local land-use planning and provincial policies. Ontario's Place to Grow Plan sets minimum targets for growth and the Municipal Comprehensive Review (MCR) currently underway by the County of Simcoe will establish the minimum growth (residents and jobs) for Innisfil. Innisfil is expecting its current population to double over the next 30 years. Innisfil's Official Plan "Our Place" guides where Innisfil will direct growth to achieve complete and sustainable communities and will be updated to align with the outcome of the County MCR process. InnServices Utilities Inc. is a wholly-owned Municipal Services Corporation of the Town of Innisfil and it relies on the Town's Official Plan.

Challenges and Opportunities

Growth generates both challenges and opportunities as InnServices navigates and balances the ongoing needs of existing residents while addressing the pressures associated with growth and the incremental increases in costs for operational needs. As InnServices looks to the future of growth and addressing the longer-term financial requirements related to asset renewal and replacement, careful and prudent planning is necessary to ensure the community remains stable, sustainable and affordable.

InnServices' Master Servicing Plan (MSP) is reviewed and updated every 5 years to respond to changes in growth based on the Town of Innisfil's Official Plan, and Growth Plan. The most recent MSP was developed in 2018 to identify the recommended new capital water infrastructure projects to accommodate the employment & population growth to the year 2031. InnServices will be updating the 2018 MSP in 2023.

The Orbit

The Orbit is a new proposed transit-oriented community to be built around a future GO Station at 6th Line and east of 20th Sideroad. The Orbit will be developed as a sustainable, higher density complete community with new residential, recreational and commercial development opportunities, cutting-edge technology and an active transportation network. The Orbit is expected to house a population of more than 20,000 people in the next 30 years. For more information on this project and other future development with Innisfil, please visit <https://www.getinvolvedinnisfil.ca/>



CLIMATE DEMANDS

InnServices is working with the Town of Innisfil to develop an Integrated Sustainability Master Plan which will identify the vulnerabilities of its infrastructure towards policy formulation and program implementation for projected future climate change impact. Changes to our climate can create challenges for municipalities to maintain the levels of service and can decrease the service life and functionality of these assets. To ensure InnServices' water assets are safe and reliable, climate change and the consideration of sustainable materials must be incorporated into the decisions and long-term planning.

InnServices' water network assets are susceptible to extreme weather events putting environmental and public health and safety in danger. InnServices' water infrastructure is designed and constructed to resist the impacts of such extreme climate events. Based on past experience, InnServices has implemented corporate processes such as additional staff on call, more training, inclusion of an emergency contingency plan and program, better communication, and adding capacity to the systems to help manage extreme climate events. InnServices inspects and monitors its water assets to ensure the safety of the public and staff.



LIFECYCLE MANAGEMENT

Lifecycle Management

All municipal infrastructure assets progress through a series of stages referred to as the asset lifecycle. Management of this lifecycle is critical for delivering consistent and reliable service and achieving the lowest possible cost over the expected life of the assets. A fundamental principle of lifecycle management is that maintaining a good condition asset costs significantly less than reconstructing a poor condition asset. The overall goal is to extend the expected life of the assets while managing risks and minimizing the total lifecycle costs. The stages of lifecycle management are as follows:

Acquisition

Municipal infrastructure assets are acquired primarily through assumption of ownership from developers but can also be constructed directly by InnServices through approved capital projects.

Operations

Planned, periodic activities such as inspection, assessment, cleaning, and servicing to fulfill LOS commitments and detect defects before failures occur.

Maintenance

Routine activities, planned and unplanned, to resolve minor defects and delay future defects.

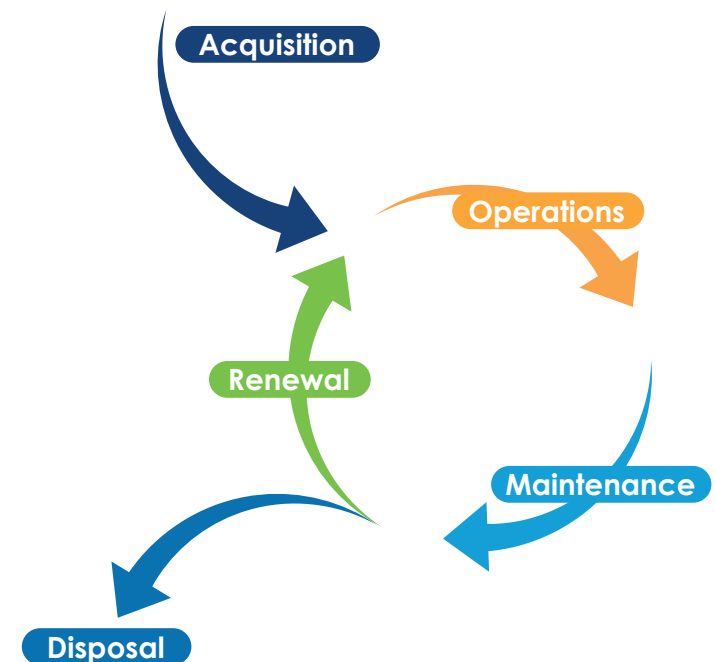
Renewal

Capital activities that are beyond the scope of routine maintenance including reconstruction and rehabilitation of assets to enhance their condition and extend the expected life of the asset.

Disposal

Removal of assets that have reached the end of their effective service life.

Figure 8: Asset Lifecycle



Lifecycle Activities

Building on the state of infrastructure and levels of service content, lifecycle activities are the actions utilized by InnServices to operate, maintain, and renew water assets in the manner most appropriate to ensure the long-term performance of assets.

Determination of the specific action to be taken in the Maintenance and Renewal stages is based on careful consideration of the asset condition, remaining life, and available budget. The timing of the activity also considers competing priorities and related project activities to minimize the risk of having to redo work that is disturbed by a related project. All this helps to ensure that InnServices is performing the most appropriate and cost effective activity to optimize the lifecycle for each asset.

Table 16: Lifecycle Activities - Water Network

Activity	Description of Activities Performed by InnServices
Assessment	<ul style="list-style-type: none"> • There is no formal condition assessment program in place. However, InnServices keeps a record of water main break history which helps to determine the condition. • New or larger assets are identified through technical analysis as part of Master Servicing Plans completed every 5 years to service new development.
Operations	<ul style="list-style-type: none"> • Hydrants and valves are inspected to see if they are operable, approximately 20% annually. • InnServices conducts regular inspections to ensure all pumping stations operate in a manner that is free from failure and meets the accepted operational standards and efficiencies. • Reservoirs are inspected every 5 years. • Pumps & motors are inspected, externally as well as internally as specified in the operations manual to identify the asset performance and remedial measures. • Generators are inspected on monthly basis as per the operational schedules. • Vehicles are inspected on an annual basis and follow CVOR (Commercial Vehicle Operators Registration) Regulations. • Health & Safety inspections are conducted every 6 months.
Maintenance	<ul style="list-style-type: none"> • InnServices performs the ongoing maintenance activities as necessary, such as emergency repairs, hydrant repairs, exercising valves. • A detailed breakdown of applicable maintenance activities is provided in Appendix B.
Renewal	<ul style="list-style-type: none"> • Vehicles and facility assets are rehabilitated and upgraded based on the condition, breakage, growth, and compliance as per Ministry Standards. • Alcona Reservoir, Innisfil Heights Reservoir, Lefroy Reservoir, Lakeshore Treatment Plant, Zone 2 Booster Station, Cookstown Standpipes are scheduled to be upgraded in the next 10 years (2021-2031). • Water assets are either removed during renewal or disconnected and abandoned in place depending on the construction circumstances. Abandoned assets are capped and/or grouted to protect other infrastructure. • Water mains in poor or very poor condition are replaced around their end of its useful life. • Undersized water mains (e.g., Cookstown) that don't meet the capacity requirements are replaced with larger mains. • Valves, valve chambers, and water laterals are replaced at the same time as water mains and on as need basis.

FINANCIAL SUMMARY

InnServices' financial summary includes the full consideration of the lifecycle costs of the existing and new water infrastructure assets. This summary along with financial policies provide guidance to InnServices while building operating and capital budgets. This financial summary guides InnServices when and where the financial resources will be needed, recognizing the immediate and future needs for the asset renewal, maintenance and growth to meet the infrastructure demands.

The Budget Process

InnServices prepares a budget on an annual basis. However, InnServices is working on developing a 10-year long financial plan to address the needs of the existing as well as new water infrastructure.

Operating Budget

InnServices' operating budgets quantify the expenditures needed to provide services, governance and administration, maintain financial funding for the current & future projects, and to perform the operational and maintenance activities required to maintain current service levels.

Capital Budget

InnServices' capital budget accounts for the lifecycle activities that would need to be undertaken to maintain the current levels of service over the next 10 years. This is required to not only satisfy provincial requirements but to also allow InnServices to qualify for grant and funding opportunities. InnServices prepares annual capital budget and provides to the Board and staff for a longer-term path for capital initiatives, recognizing immediate and future needs that include existing asset replacements and growth required infrastructure demands.

The 2022 capital budget has been developed within the COVID lens along with existing master servicing plan, a development charges background study, Asset Management Planning and other input documents that guide the focus to where and when financial resources are needed. The capital budget is used to fund the acquisition, renewal and maintain current service levels.

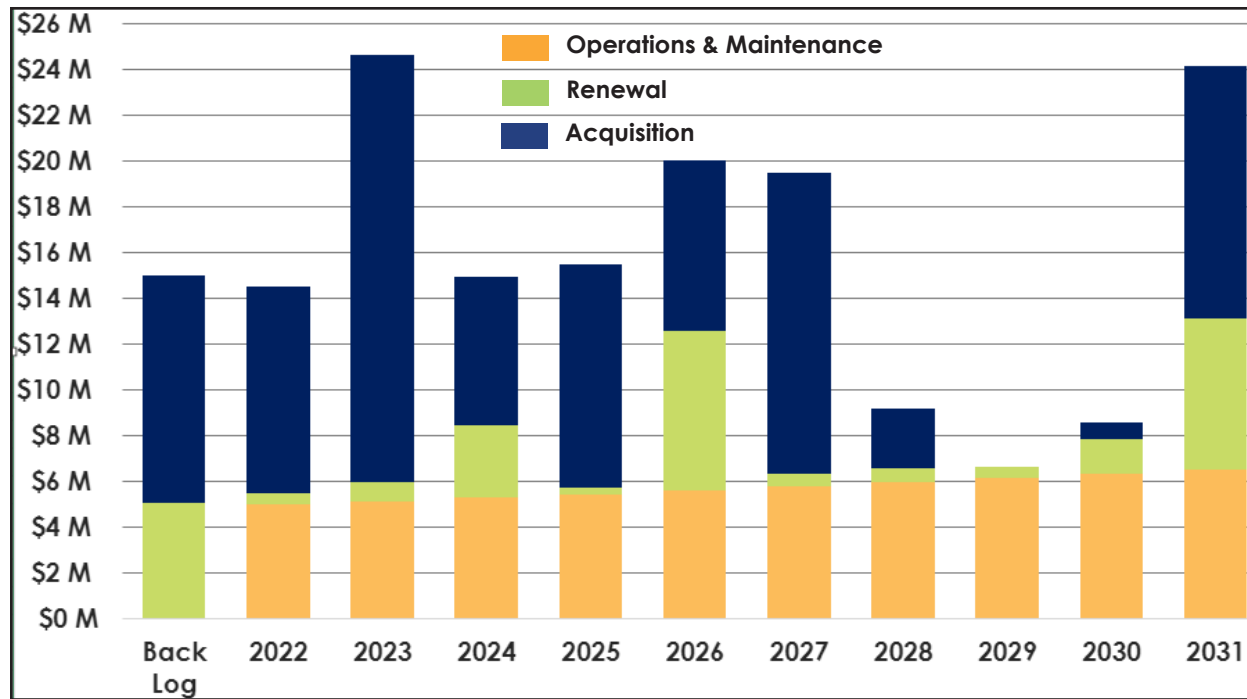


Table 17: Capital Revenue Sources

Revenue Source	Description	Growth or Renewal
Development Charges	Development charges are collected for new construction. These funds are restricted in use through provincial legislation and are used solely for the purpose of specific growth-related capital projects, such as new water infrastructure and facilities needed to accommodate growth and various growth studies. These funds must be reported annually on how they were used.	Growth
Rates Revenue	This category is comprised largely of water rates revenue. Amounts are collected monthly to support the ongoing maintenance, rehabilitation, or replacement of the existing water infrastructure.	Renewal
Grants & Other Recoveries	Grant funds received from the federal and provincial government related to water infrastructure (if InnServices qualify). Grant funds can also be received from other agencies or external parties.	Renewal / Growth



Figure 9: 10-Year Lifecycle Activities Forecast - Water Network



10-Year Lifecycle Activities Forecast

O. Reg. 588/17 requires municipalities to provide a 10-year forecast that estimates the annual costs of lifecycle activities that will need to be undertaken to maintain the current levels of service and accommodate expected growth. This forecast is presented in Figure 9 and Table 18.

Asset renewal includes the capital costs for the existing water infrastructure to be replaced/rehabilitated in the next 10 years. Acquisition costs includes the new infrastructure scheduled to be built as per the Master Servicing Plan over the period of next 10 years. For the Operations & Maintenance costs, the 2021 operational & maintenance budget costs are extrapolated to 2031.

Table 18: 10-Year Financial Summary - Water Network

Lifecycle Phase	Back Log	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Operations & Maintenance	\$0	\$4.9 M	\$5.1 M	\$5.2 M	\$5.4 M	\$5.5 M	\$5.7 M	\$5.9 M	\$6.1 M	\$6.2 M	\$6.4 M
Renewal	\$5.0 M	\$462 K	\$854 K	\$3.1 M	\$281 K	\$6.9 M	\$558 K	\$637 K	\$475 K	\$1.5 M	\$6.5 M
Acquisition	\$9.9 M	\$9.0	\$18.6 M	\$6.4 M	\$9.7 M	\$7.4 M	\$13.1 M	\$2.6 M	\$0	\$736 K	\$11.0 M
Total	\$15.0 M	\$14.4 M	\$24.6 M	\$14.9 M	\$15.4 M	\$20.0 M	\$19.4 M	\$9.1 M	\$6.5 M	\$8.5 M	\$24.1M

MONITORING & IMPROVEMENT

In this final section of the AMP, opportunities for improvement of InnServices' asset management program and the AMP are identified along with planned activities to strengthen both. These planned activities will ensure that InnServices continues to comply with O. Reg. 588/17 and that the utility of the AMP and the level of data confidence continuously improves over the short to medium term.

Continuous Improvement

The overall approach to monitoring and improving the asset management program and AMP will be consistent with the Plan-Do-Check-Act (PDCA) model. Following this model, staff will monitor asset management program performance ongoing and continue to plan and implement corrective actions to ensure that program and AMPs continue to improve and mature over time.

Improvement Plan

Table 19 on the following page, summarizes the improvement opportunities currently identified and the corrective actions planned for the next three years. A term of three years has been selected to align with the AMP deliverables detailed in O. Reg. 588/17 and summarized in Figure 1 of the AMP.

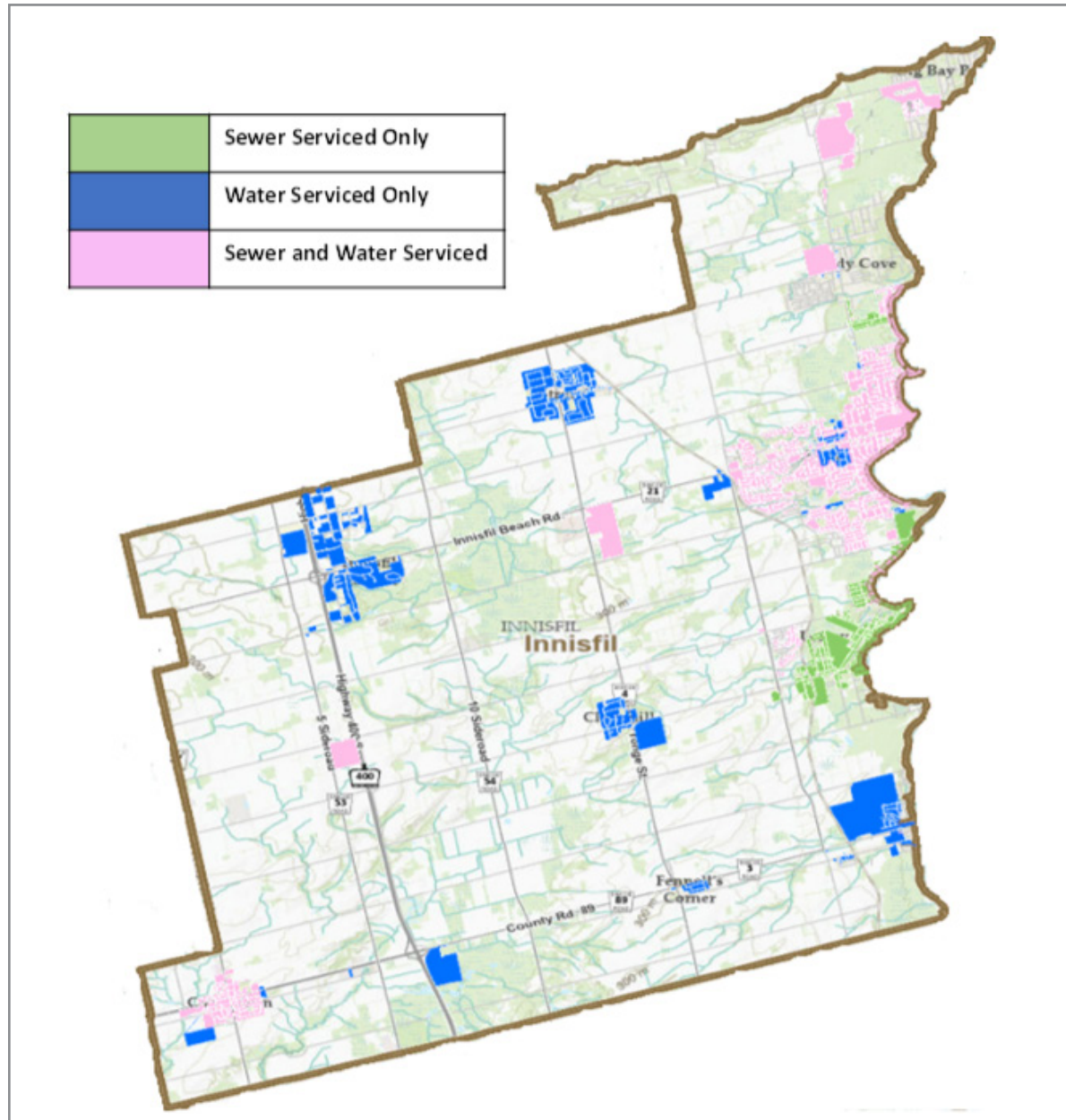


Table 19: Improvement Plan

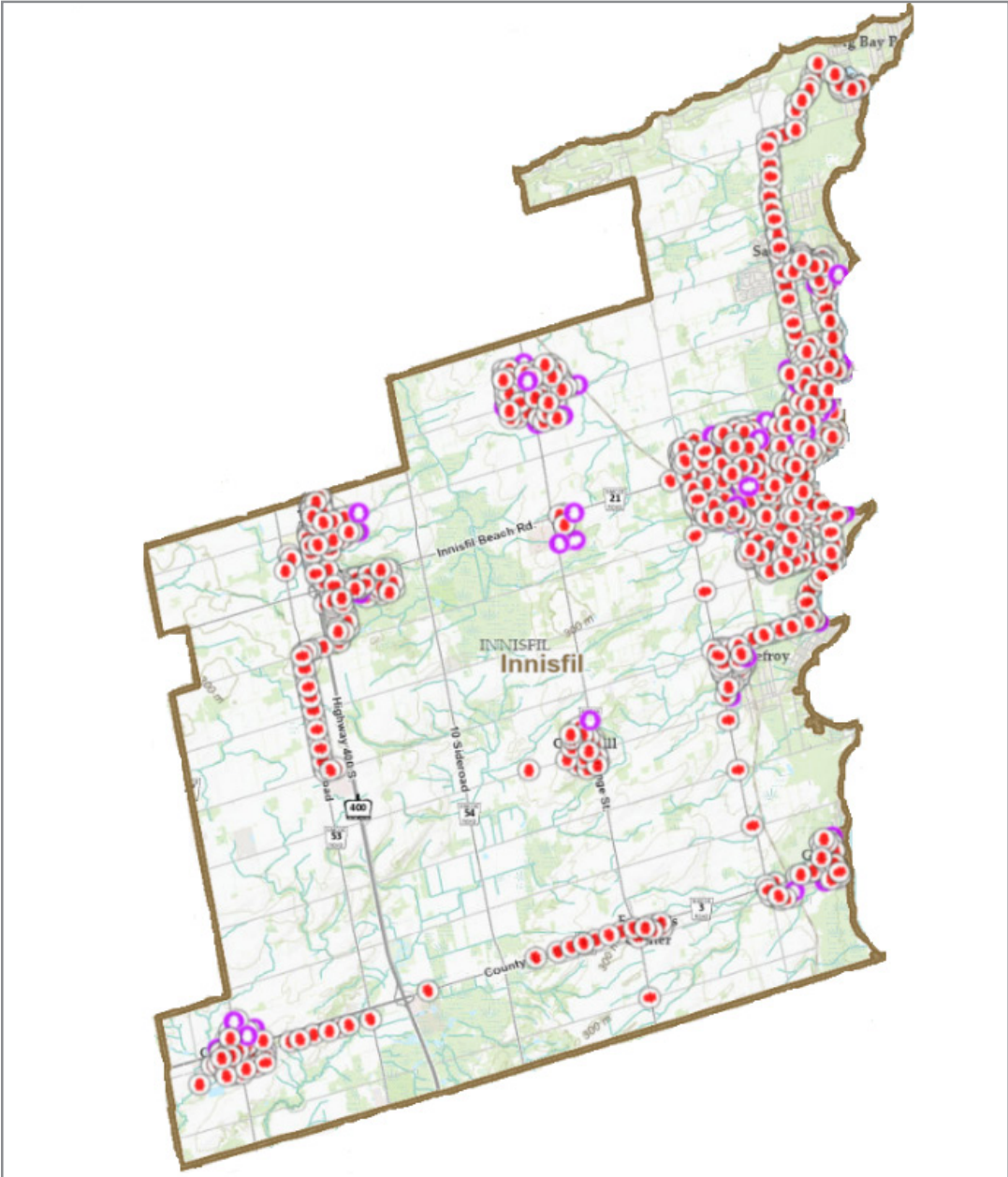
Opportunity	Actions	Priority
Improve completeness and accuracy of state of infrastructure data.	Complete water linear and facility assets inventory.	High
	Complete condition assessments of all the assets.	High
	Complete mapping of tangible capital assets data into GIS inventory.	High
Improve asset management processes for creation, maintenance, and disposal of asset records.	Complete mapping of processes.	High
	Prepare standard operating procedure documentation for assets and integrate with year end.	Medium
Improve maturity of level of service reporting for core and non-core assets.	Expand level of service definitions for all the assets.	Medium
	Establish level of service targets.	High
	Formalize data gathering and reporting procedures for each level of service.	Medium
Improve maturity of risk identification and treatment.	Establish risk management committee.	Medium
	Revise & update risk framework for assets.	Medium
Expand asset management program.	Establish inventory systems for facility assets.	High
	Gather state of infrastructure data for facility assets.	High
Enhance long term financial planning for asset lifecycle.	Identify costs associated with target levels of service and scenarios to achieve same.	High
Enhance strategic asset management policy.	Complete review and release of updated policy.	Low
Enhance public reporting of asset management information.	Enhance asset management content on InnServices' website.	Low
Enhance asset management links to climate change planning.	Expand climate change coverage in 2024 and 2025 AMP's.	Medium

APPENDIX A - LEVEL OF SERVICE MAPS

Levels of Service - Servicing Map



Levels of Service - Fire Flow Map



APPENDIX B - MAINTENANCE ACTIVITIES

Maintenance	Summary of Activity
Backflow Prevention Program	InnServices staff identify all possible sources that may be a point of potential cross connection contamination and inspections to ensure there is no backflow and there is safe drinking water.
Cleanouts	Carried out regularly to keep machinery, equipment, and work areas clear of dirt, materials, and foreign objects. The preventative measures ensure the asset is running at ideal performance and is easy to access, inspect, and repair when required.
Facility Assets	Facility equipment such as overhead cranes, straps, harnesses, chain falls, hoisting equipment, forklifts, turbidimeters, flow meters, and genie lifts are inspected externally, every year.
	Equipment is tested and calibrated to their original standard every three months, internally and externally on annual basis. If the asset is determined to be outside of the allowable tolerance even after recalibration will then be repaired or replaced with a back-up.
	Lubricating involves the periodic application of a lubricant (oil, grease, solid) to contact and wear surfaces to prevent wear, corrosion, and friction. Lubrication schedules typically follow manufacturer's recommendations.
Repairs - Watermain breaks and water meters	InnServices Investigates and confirms the watermain break, notifies and creates the required work orders and repair instantly.
	Repairs of leaking water meters will be initiated by a complaint from a property owner. Goals are to eliminate leaking water meter, reduce water loss and ensure safety of drinking water.
Spills & Clean Up	Identify the nature and source of spill, containment, and clean-up by the InnServices operation and maintenance staff, if a spill occurred then absorbent materials and sand would be used to aid in clean up, collection of which would be in hazardous waste bins.
Unidirectional Flushing	Unidirectional watermain flushing to address water quality issues related to the accumulated sediment, biofilm, increased chlorine demand, discoloured water, and customer complaints.
Valves, Hydrants, Valve Chamber	Expose the underground asset to replace, relocate and repair the hydrant, hydrant lead, valve box and chamber to ensure proper operation and continuous supply of safe drinking water to the residents.
	Hydrant pump-out is done every year before the winter for all the hydrants to ensure that hydrant barrels are drained and are free of water over the winter to avoid freezing.
	All frozen hydrants are returned to service in a timely manner during winter conditions. Utilizing a steamer, hydrant is thawed, and barrel is pumped out.
	Hydrant flow testing is part of annual summer maintenance program.

Maintenance	Summary of Activity
Fleet	Vehicle oil changes between 5000 - 7000 km as per the owner's manual.
	Tire changes every winter and summer season, and breakdown maintenance as on need basis.
Water Service Lateral Repair & Hard Surface Restoration	InnServices repairs the portion of a water lateral, from the main to the property line as on need basis. InnServices also restores the hard surfaces within the road allowance for the repairs as on need basis.
	Thawing of frozen water services on InnServices' property using an approved thawing machine. Heat is applied to the water service line and as it travels throughout the pipe it thaws the frozen water.