

# **INNSERVICES UTILITIES INC.**

## WASTEWATER NETWORK ASSET MANAGEMENT PLAN 2022



# VERSION HISTORY

Version	Date	Description
1.0		Board Approval

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# EXECUTIVE SUMMARY

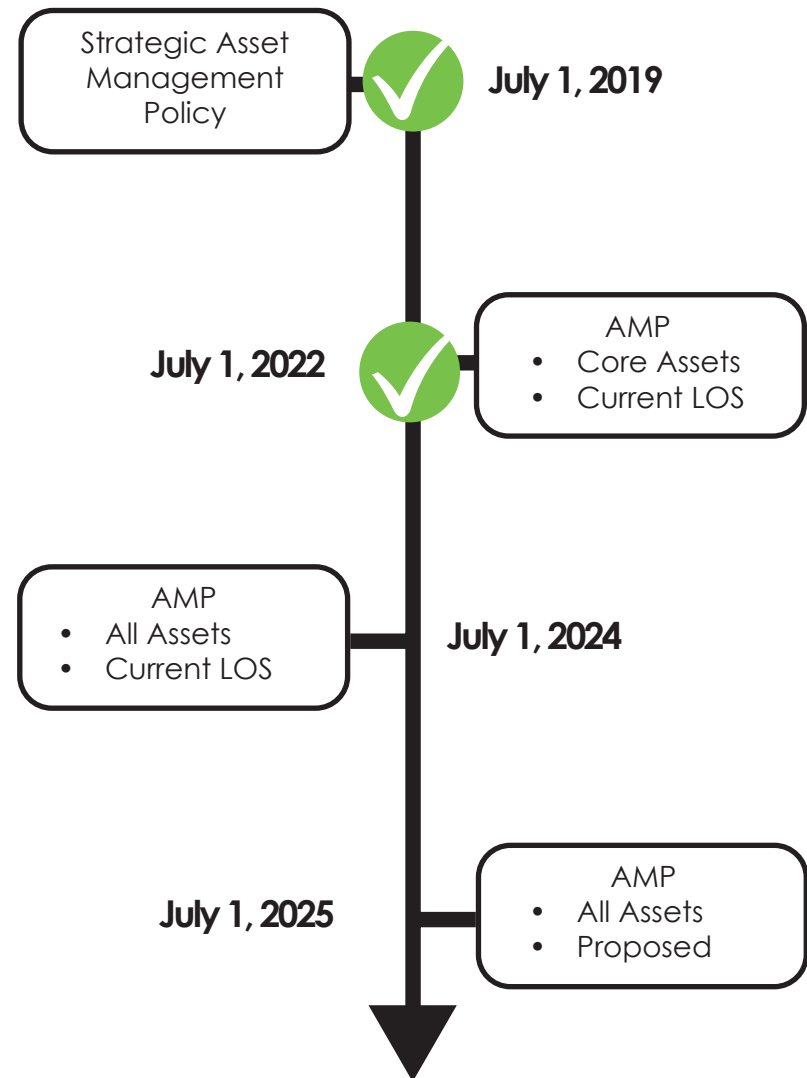
InnServices owns and manages a large range of wastewater assets on the behalf of our community. These assets provide services that are to be managed in a cost-effective way, while ensuring they continue to meet the needs of the community now and in the future.

The Wastewater Network Asset Management Plan (AMP) focuses on the InnServices wastewater assets and specifies the requirements for effective management of the assets and their corresponding financial implications. Wastewater assets include sanitary sewers, force mains, maintenance holes, sanitary services, fleet, pumping stations, and wastewater treatment plants. These assets are responsible for the collection, treatment and disposal of the wastewater.

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 wastewater 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, water and wastewater assets.

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

The Wastewater network is a component of InnServices' core infrastructure assets. These assets provide valuable services to the public, such as safe waste treatment and disposal, and to assist in maintaining the health of the environment. 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.

This plan 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 wastewater 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 "wastewater network" asset types include gravity mains, force mains, maintenance holes, sanitary 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.

**Wastewater Network:** Wastewater assets that relate to the collection, transmission, treatment or disposal of wastewater, including any wastewater asset that from time to time manages stormwater.

**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 a 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.

**Sewer Relining:** Technique of inserting a liner into a sewer; used to restore sewers nearing the end of their useful life to like-new condition.

**Combined sewers:** A type of gravity sewer with a system of pipes, tunnels, and pump stations to transport sewage and stormwater together to a sewage treatment plant or outfall.

## Acronyms:

**AMP** = Asset Management Plan

**LOS** = Levels of Service

**CPI** = Construction Price Index

**CVOR** = Commercial Vehicle Operators Registration

**CCTV** = Closed Circuit Television Video

**ECA** = Environmental Compliance Approval

**CI** = Continuous Improvement

**PDCA** = Plan-Do-Check-Act

**MCR** = Municipal Comprehensive Review

**MSP** = Master Servicing Plan

**O. Reg** = Ontario Regulation

**NASSCO** = National Association of Sewer Service Companies

# ASSET HIERARCHY

## Asset Hierarchy

InnServices has adopted an asset hierarchy approach to develop the framework for categorizing the Wastewater network 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 Wastewater Network assets:

**Table 1: Wastewater Network Asset Hierarchy**

Level 1	Level 2	Level 3	Level 4
Wastewater Network	Wastewater Linear Assets	Gravity Mains	Type, Size, Material, Slope
		Sanitary Laterals	Type, Size, Material
		Maintenance Holes	Type, Size
		Forcemains	Type, Size, Material
	Wastewater Facility Assets	Wastewater Treatment Plants	Process Area, Component
		Pumping Stations	Component
		Process & Yard Piping	Component
		Equipment & Furnishings	Component
		Services	Component
		Pumps & Motors	Component
		Sanitary Valves	Component
		Land Improvements	Component
		Miscellaneous Assets	Component
	Wastewater Fleet Asset	Vehicles & Trailers	Type



# STATE OF INFRASTRUCTURE

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


- Wastewater Linear Assets
- Wastewater Facility Assets
- Wastewater 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 to efficient and effective lifecycle management and financial planning.


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



Wastewater  
Linear Assets


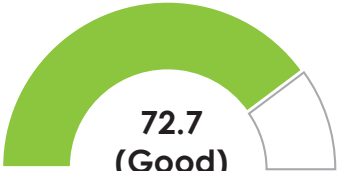


Wastewater  
Facility Assets


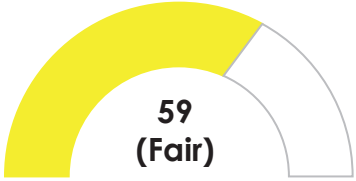


Wastewater  
Fleet Assets



**Table 2: Wastewater Linear Assets Summary**

Asset Type	Asset Sub-Type	Quantity	Replacement Value	Average Age	Average Condition
	Forcemains	14.9 km	\$435.9 million	21.4 years	
	Maintenance Holes	1964			
	Sanitary Laterals	114.7 km			
	Gravitiemains	144.8 km			

**Table 3: Wastewater Facility Assets Summary**

Asset Type	Asset Sub-Type	Quantity	Replacement Value	Average Age	Average Condition
	Wet Wells	15	\$151.2 million	25.2 years	
	Land Improvements	79			
	Sanitary Valves	224			
	Pumps & Motors	72			
	Services	17			
	Equipment & Furnishings	201			
	Process & Yard Piping	16			
	Pumping Stations	9			
	Wastewater Treatment Plants	2			

**Table 4: Wastewater Fleet Assets Summary**

Asset Type	Asset Sub-Type	Quantity	Replacement Value	Average Age	Average Condition
	Vehicles & Trailers	7*	\$470 thousand	9.9 years	

\* Fleet quantity includes 4 vehicles and 3 trailer assets

## Wastewater 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' Wastewater Network asset hierarchy, with asset sub-types and data available.

### Wastewater Linear assets are classified into four (4) sub-types:

- **Force Mains** - Pressurized pipelines that transport wastewater uphill from lower elevation pumping stations to wastewater treatment plants.
- **Maintenance Holes** - Vertical concrete shafts used for inspection and maintenance, and to vent gasses out of gravity mains.
- **Sanitary Laterals** - The sewage service line that drains wastewater from a property into a gravity main.
- **Gravity Mains** - Pipeline laid typically under the centre line of the road, used to transport wastewater to a pumping station.

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

- **Wet Wells** - the structure where the raw sewage is collected prior to passing through the lift pumps or being processed in a treatment plant.
- **Land Improvements** - Include assets such as fences, walkways, parking lots, and outdoor lighting.
- **Sanitary Valves** - An element in the wastewater treatment plants to control the flow and pressure of wastewater related liquids.
- **Pumps & Motors** - A class that groups all mechanical pumps and motors within InnServices' facilities.
- **Services** - A grouping that includes facility related assets such as HVAC and motor control systems
- **Equipment & Furnishings** - It includes frequency drives, lifting equipment, cameras, portable radios, shelving, and cabinets contained in the InnServices' facilities.
- **Process & Yard Piping** - Any main, lateral, valves, or fittings installed within the facilities for the collection, treatment and distribution of the wastewater.
- **Pumping Stations** - It is typically designed to handle wastewater that is fed from underground gravity pipelines and is pumped to a wastewater plant.
- **Wastewater Treatment Plants** - A plant designed to remove enough contaminants and impurities from wastewater so that it is suitable to be released into the environment.

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

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

### Replacement Value - Wastewater Network Assets

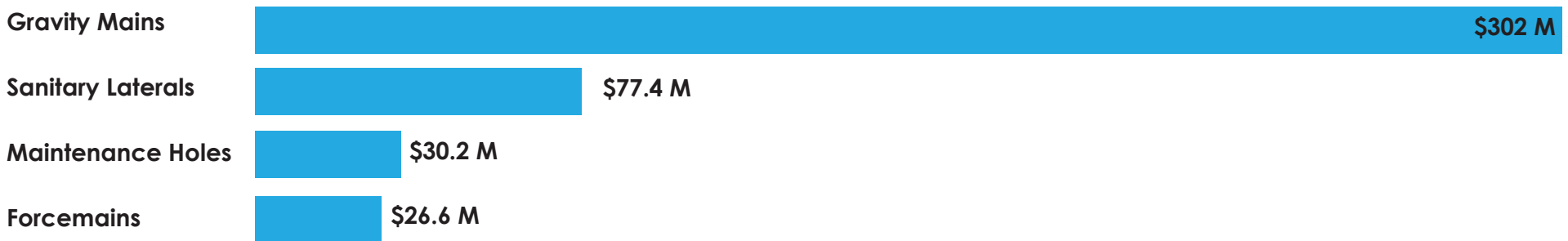
Asset replacement value is determined by estimating the total replacement value of the assets within each asset class. All wastewater network assets analysed in the AMP have a total replacement value of \$588 million. The replacement value of the Wastewater Linear and Wastewater Fleet assets is estimated by using the Cost/Unit method. However, Construction Price Index (CPI) Method is used to estimate the replacement value of the Wastewater 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 wastewater network replacement value is predominantly in gravity mains and wastewater facility assets. Figure 2 displays the total replacement value of Wastewater Linear Assets.

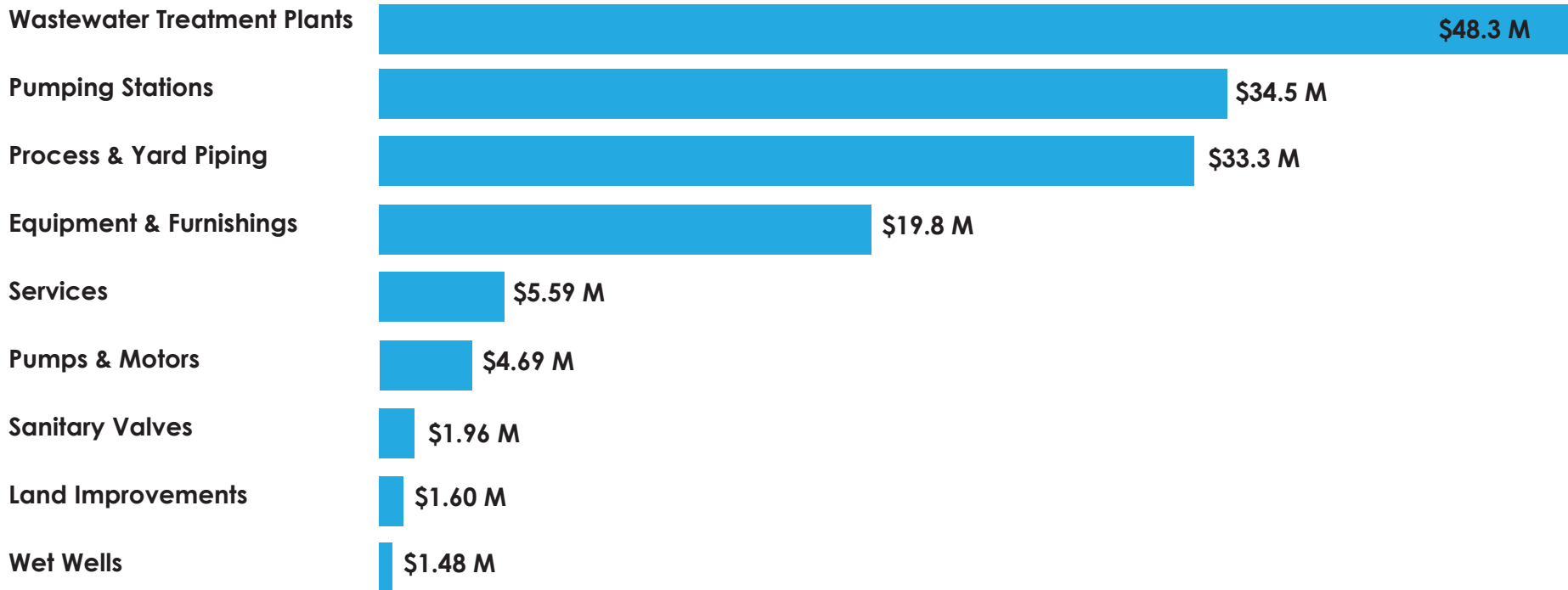
**Figure 2: Replacement Value of Wastewater Linear Assets**



### Replacement Value - Wastewater Facility Assets

Wastewater Facility assets analyzed in the AMP have a total replacement value of \$151.2 million. Figure 3 displays the total replacement value of each asset class. As per the asset hierarchy approach, the Wastewater Facility assets are broken down to nine segments as shown in Figure 3.

Figure 3: Replacement Value of Wastewater Facility Assets



### Replacement Value - Wastewater Fleet Assets

Wastewater Fleet assets analyzed in the AMP have a total replacement value of \$0.47 million. The replacement value of Wastewater Fleet assets is estimated using the Cost/Unit method and is displayed in Figure 4.

Figure 4: Replacement Value of Wastewater Facility 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' Wastewater Network assets.


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

Asset Type	Asset Sub-Type	Expected Life (Years)	Average Age (Years)	Service Life Remaining (Years)
	Forcemains	75	13.5	61.5
	Maintenance Holes	75	20.5	54.4
	Sanitary Laterals	75	21.3	53.7
	Gravity Mains	70-80	22.2	57.5

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

Asset Type	Asset Sub-Type	Expected Life (Years)	Average Age (Years)	Service Life Remaining (Years)
	Wet Wells	40	28.2	11.7
	Land Improvements	20-30	28.1	3.6
	Sanitary Valves	30-75	31.5	41.6
	Pumps & Motors	25-30	21.4	7.7
	Services	20-35	16.8	15.7
	Equipment & Furnishings	10-40	18.1	16.0
	Process & Yard Piping	50-75	29.7	44.7
	Pumping Stations	75	18.7	56.2
Wastewater Treatment Plants	40-100	30.6	45.8	

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

<b>Asset Type</b>	<b>Asset Sub-Type</b>	<b>Expected Life (Years)</b>	<b>Average Age (Years)</b>	<b>Service Life Remaining (Years)</b>
	Vehicles & Trailers	10-15	9.8	1.1



## Condition

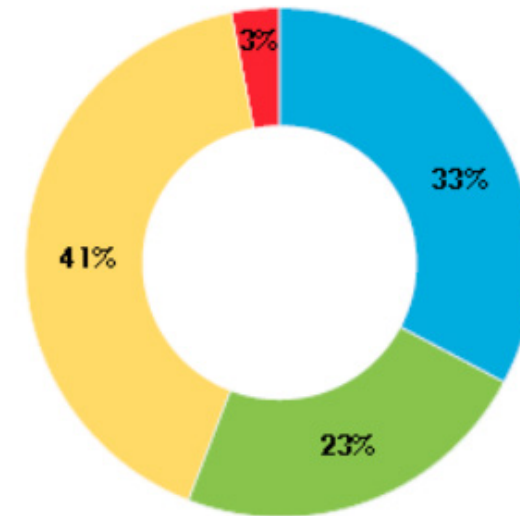
The assessed condition data allows InnServices to more confidently determine the remaining service life of the assets and help identify the infrastructure needs to maximize an asset's useful life while lowering the total lifecycle costs.

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. Overall, the average condition of InnServices' Wastewater Network assets is good with an average condition of 69.

**Figure 5: Condition of Wastewater Network**



**Table 8: Condition Assessment Descriptions**




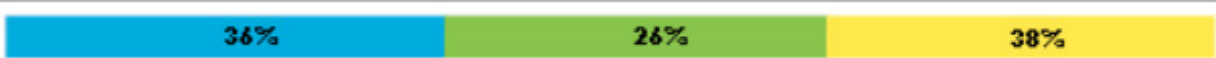
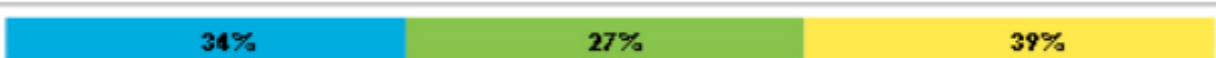
Condition Index	Condition Description
80-100 Excellent	The asset is fit for the future. It is well maintained, in good condition, new or recently rehabilitated.
60-79 Good	The asset is adequate. It is acceptable and generally approaching the mid-stage of its expected service life.
40-59 Fair	The asset 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.



## Wastewater Linear Assets Condition

Table 9 shows the asset class condition ratings determined through the age-based estimates of each asset type. Overall, 63% of Wastewater Linear assets are in good or excellent condition, whereas, 0% 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: Wastewater Linear Assets - Condition Summary**







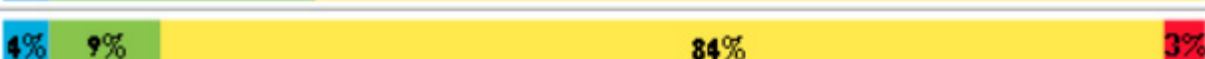
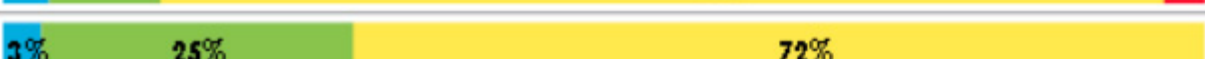


Asset Type	Asset Sub-Types	Average Condition	Condition Summary		
	Forcemains	82			
	Maintenance Holes	73			
	Gravity Mains	72			
	Sanitary Laterals	72			

63% of Wastewater Linear assets are in good or excellent condition.

## Wastewater Facility Assets Condition

Wastewater Facility assets are further broken down into more detailed segments as shown in Table 10. 34% of Wastewater Facility assets are in good or excellent condition, whereas, 14% assets are in poor or very poor condition. The majority of Wastewater Facility assets are in fair condition with an average condition rating of 59.

**Table 10: Wastewater Facility Assets - Condition Summary**



Asset Type	Asset Sub-Types	Average Condition	Condition Summary
	Pumping Stations	75	
	Equipment & Furnishings	40	
	Services	50	
	Pumps & Motors	27	
	Process & Yard Piping	60	
	Sanitary Valves	56	
	Wastewater Treatment Plants	60	
	Land Improvements	12	
	Wet Wells	30	

Wastewater Facility assets are mostly in fair condition with an average condition rating of 59.

### Wastewater Fleet Assets Condition

Wastewater Fleet assets are further broken down into more detailed segments in Table 11. 26% of Wastewater Fleet assets are in poor condition, whereas, 74% assets are in very poor condition.

**Table 11: Wastewater Fleet Assets - Condition Summary**

Asset Type	Asset Sub-Types	Average Condition	Condition Summary
	Vehicles & Trailers	14	 26% 74%

# 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 rely 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
Committed to maintain the health of our environment and protecting Lake Simcoe through the best management practices and technological advancements and as per the requirements of Environmental Compliance Approval(s) (ECA).		1.1 Plan for and manage growth 2.2 Enhance movement of people 3.1 Maintain and protect existing infrastructure 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 wastewater 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 wastewater system.	Appendix A - Levels of Service Maps
Reliability	Description of how stormwater can get into sanitary sewers in the municipal wastewater system, causing sewage to overflow into streets or backup into homes.	<p>Stormwater can enter sanitary system in the following ways:</p> <ol style="list-style-type: none"> <li>1) Through holes and cracks in the maintenance holes and sewers often caused due to age (wear and tear).</li> <li>2) Through un-accounted connections of household plumbing items; down spouts, roof leaders and yard drains to the sanitary system.</li> <li>3) Through floor drains in the flooded basement, or via top of the maintenance holes in a flooded road, etc. Such situations happen only when the storm water management system is overwhelmed and is not capable to handle the rainwater or river flow.</li> <li>4) At low lying streets/roads during heavy rainfall, overwhelmed water accumulates creating pool which eventually enters through the manhole covers if they are not water tight.</li> </ol>
	Description of how sanitary sewers in the municipal wastewater system are designed to be resilient to avoid events described above.	InnServices follows a series of the best engineering design standards that integrate both current & future servicing requirements and land use considerations, when constructing or replacing sanitary sewers. These standards have been determined with consideration of the minimization of sewage overflows, backups, and to reduce the inflow and infiltration.
	Description of the effluent that is discharged from sewage treatment plants in the municipal wastewater system.	Not applicable, as to the best of wastewater department's database there is no individual separate community or ICI (Industrial, commercial and Institutional) based wastewater treatment system discharging their effluents in the InnServices' wastewater network. InnServices wastewater system includes two treatment plants and associated collection network with no intermediate wastewater treatment plants.

## 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**

<b>Service Attribute</b>	<b>Performance Measure</b>	<b>Current Performance</b>
<b>Scope</b>	Percentage of properties connected to the municipal wastewater system.	75%
<b>Reliability</b>	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.	InnServices does not have combined sewers.
	The number of connection-days per year due to wastewater backups compared to the total number of properties connected to the municipal wastewater system.	0.0006
	The number of effluent violations per year due to wastewater discharge compared to the total number of properties connected to the municipal wastewater system.	0.0002
<b>Performance</b>	Actual Reinvestment Rate	0.38%
	Percentage of assets in 'Good' or 'Excellent' condition	56.06%
	Percentage of assets in 'Poor' or 'Very Poor' condition	3.4%
	Average risk rating associated to the wastewater network	4.92

# 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 described 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

	Severe	MEDIUM	HIGH	HIGH
Impact	Moderate	LOW	RISK	HIGH
	Minor	LOW	LOW	MEDIUM
		Unlikely	Possible	Likely
		Likelihood		





## 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 Wastewater Network assets to demonstrate the application of the risk management methodology.



**Table 15: Sample Risks - Wastewater Network Assets**

Risk	Likelihood	Impact	Risk Rating	Treatment
Risk of sewer blockage	Possible	Moderate	Medium	Accept and resolve as reported
Risk of service disruption	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 equipment assets	Possible	Sever	High	Accept and resolve as reported
Risk of sewage bypass	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 wastewater infrastructure projects to accommodate the employment & population growth to the year 2031. InnServices will be updating the 2018 MSP in

## 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 wastewater assets. To ensure InnServices' wastewater assets are safe and reliable, climate change and the consideration of sustainable materials must be incorporated into the decisions and long-term planning.

InnServices' wastewater network assets are susceptible to extreme weather events putting environmental and public health and safety in danger. InnServices' wastewater 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 wastewater assets to ensure the safety of the public and staff.



# LIFECYCLE MANAGEMENT

## Lifecycle Management

All 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 assets in good condition, 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

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.

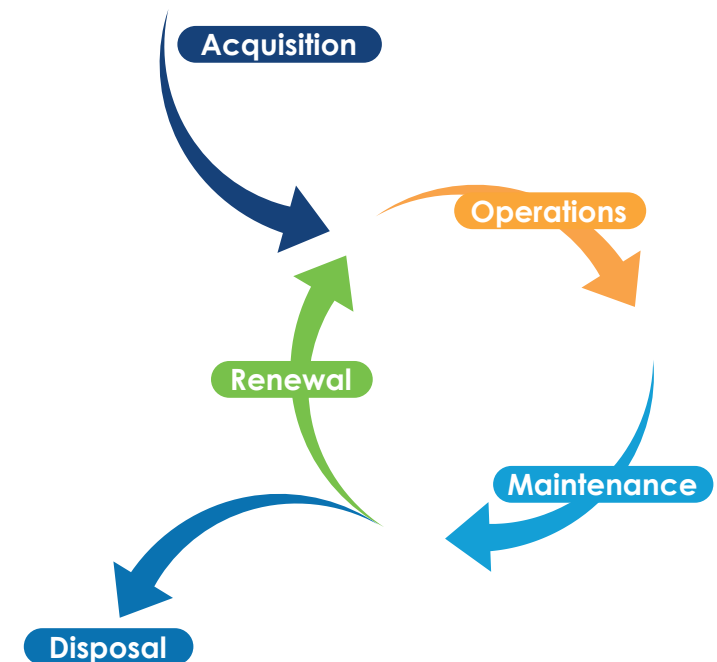
### Renewal

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 wastewater 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 - Wastewater Network**

Activity	Description of Activities Performed by InnServices
<b>Assessment</b>	<ul style="list-style-type: none"> <li>• There is no formal condition assessment program in place. However, InnServices is starting a condition assessment program to investigate the condition of sanitary sewers as per NASSCO Standards.</li> <li>• New or larger assets are identified through technical analysis as part of Master Servicing Plans completed every 5 years to service new development.</li> </ul>
<b>Operations</b>	<ul style="list-style-type: none"> <li>• 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.</li> <li>• Pumps &amp; motors are inspected, externally as well as internally as specified in the operations manual to identify the asset performance and remedial measures.</li> <li>• Generators are inspected on monthly basis as per the operational schedules.</li> <li>• Vehicles are inspected as on annual basis and follow CVOR (Commercial Vehicle Operators Registration) Regulations.</li> <li>• Health &amp; Safety inspections are conducted every 6 months.</li> </ul>
<b>Maintenance</b>	<ul style="list-style-type: none"> <li>• InnServices performs the ongoing maintenance activities as necessary, such as emergency repairs, maintenance hole repairs, exercising valves.</li> <li>• A detailed breakdown of applicable maintenance activities is provided in Appendix B.</li> </ul>
<b>Renewal</b>	<ul style="list-style-type: none"> <li>• Sanitary sewers in very poor or poor conditions are replaced around their expected useful life.</li> <li>• Vehicles and facility assets are rehabilitated and upgraded based on the condition, breakage, growth, and compliance as per Ministry Standards.</li> <li>• Wastewater 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.</li> <li>• Undersized sanitary sewers that don't meet the capacity requirements are replaced with larger mains .</li> <li>• InnServices would adopt relining of sanitary sewers as a major rehabilitation strategy.</li> <li>• Sanitary maintenance holes &amp; laterals are typically replaced with sanitary sewers.</li> </ul>

# FINANCIAL SUMMARY

InnServices' financial summary includes the full consideration of the lifecycle cycle costs of the existing and new wastewater 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 wastewater 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 the 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.

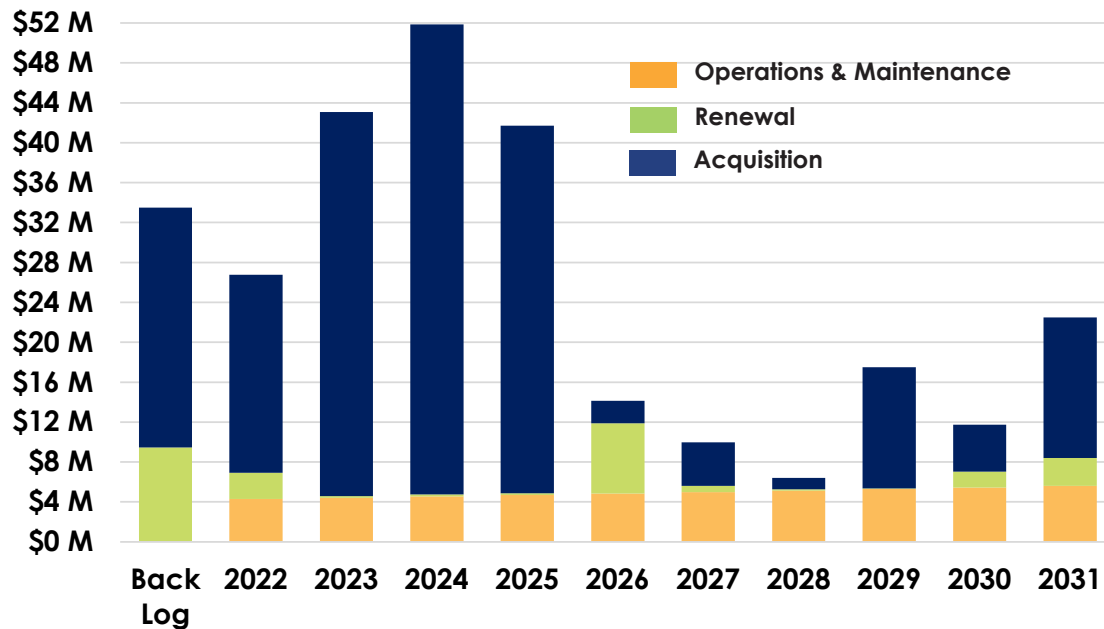


**Table 17: Capital Revenue Sources**

<b>Revenue Source</b>	<b>Description</b>	<b>Growth or Renewal</b>
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 wastewater 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 sewer rates revenue. Amounts are collected monthly to support the ongoing maintenance, rehabilitation, or replacement of the existing wastewater infrastructure.	Renewal
Grants & Other Recoveries	Grant funds received from the federal and provincial government related to wastewater 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 - Wastewater 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 wastewater 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 - Wastewater Network**

Lifecycle Phase	Back Log	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Operations & Maintenance	\$0	\$4.2 M	\$4.4 M	\$4.5 M	\$4.6 M	\$4.8 M	\$4.9 M	\$5.1 M	\$5.2 M	\$5.4 M	\$5.6 M
Renewal	\$9.4 M	\$2.6 M	\$149 K	\$190 K	\$172 K	\$7.0 M	\$641 K	\$128 K	\$78 K	\$1.6 M	\$2.8 M
Acquisition	\$24.0 M	\$19.8 M	\$38.5 M	\$47.1 M	\$36.8 M	\$2.2 M	\$4.3 M	\$1.1 M	\$12.1 M	\$4.7 M	\$14.0 M
<b>Total</b>	<b>\$33.5 M</b>	<b>\$26.7 M</b>	<b>\$43.0 M</b>	<b>\$51.8 M</b>	<b>\$41.6 M</b>	<b>\$14.1 M</b>	<b>\$9.9 M</b>	<b>\$6.4 M</b>	<b>\$17.4 M</b>	<b>\$11.7 M</b>	<b>\$22.4 M</b>

# MONITORING & IMPROVEMENT

In this final section of the Wastewater 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.

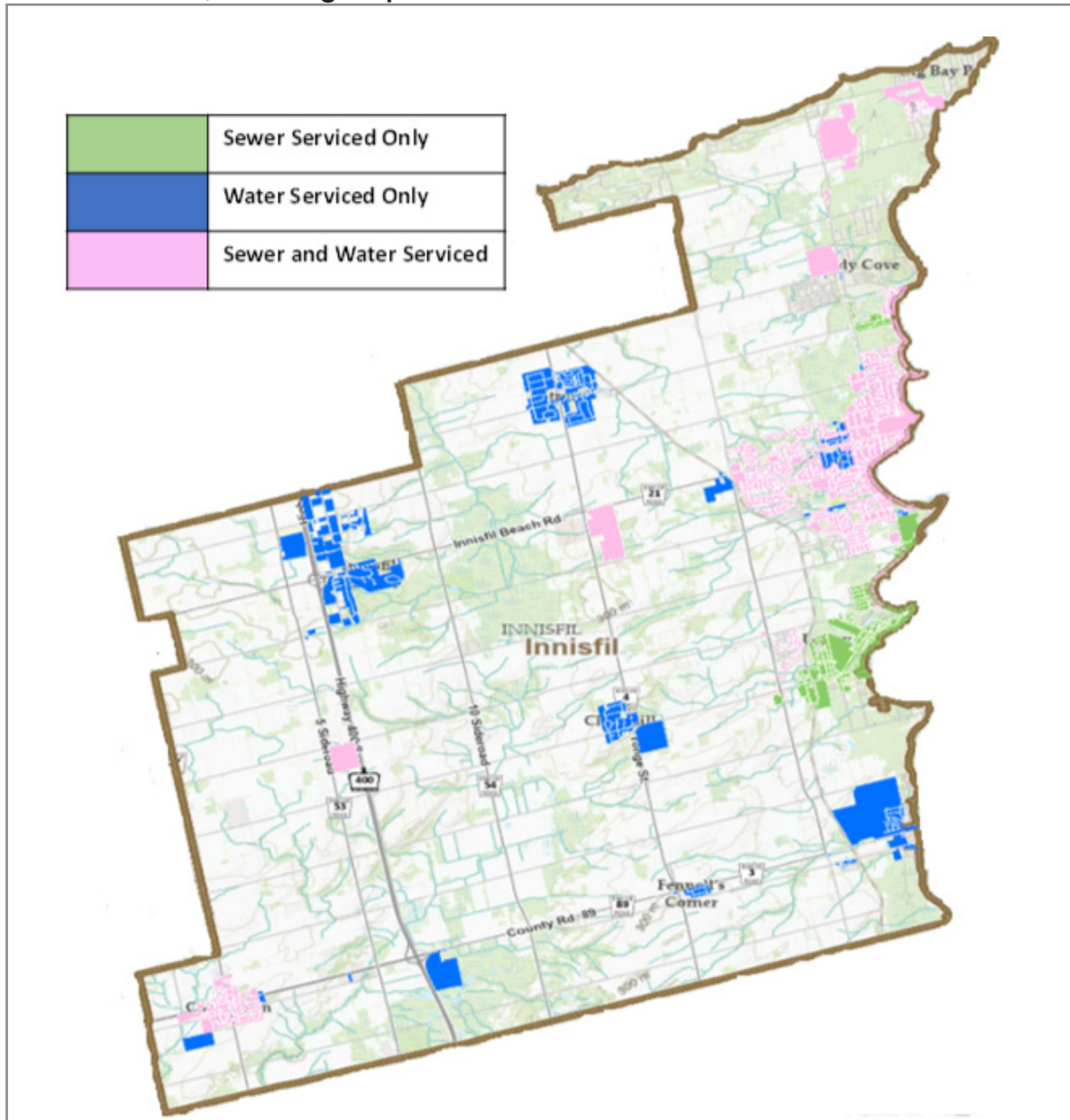


**Table 19: Improvement Plan**

Opportunity	Actions	Priority
Improve completeness and accuracy of state of infrastructure data.	Complete wastewater 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

InnServices LOS, Servicing Map



# APPENDIX B - MAINTENANCE ACTIVITIES

Maintenance	Summary of Activity
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	Pumping station cleaning is done internally as well as externally on an as needed basis.
	Facility equipment is tested and calibrated to its original standard based on regulatory requirements and the owner's manual. If the asset is determined to be outside of the allowable tolerance even after recalibration then be repaired or replaced.
	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.
	Wet well screen cleaning, pumping down and blockage removal is done as identified through the regular inspection of pumping stations.
Hazardous Waste Disposal	Hazardous wastes generated due to spill response activities are to be hauled & disposed of by contractors at Ministry approved locations.
Odour Complaints	For odour complaints, an inspection of the area will be conducted to determine the remedial measures.
Sewer Cleaning & Flushing	Flushing is to occur on a 3-4 year cycle (based on contract prices) where pressurized water is used to flush out individual sections of sewer to reduce build-up of material and decrease the risk of blockages.
	Reactive maintenance plans such as emergency flushing are in place for potential sewer gases and blockages of sewers.
Sewer Service Lateral Repair & Hard Surface Restoration	InnServices repairs the portion of a sanitary service line, from the sewer to the property line on an as needed basis. InnServices also restores the hard surfaces within the road allowance for the repairs on an as needed basis.
Spills & Clean Up	Identify the nature/source of the spill, containment, and clean-up by InnServices' operation and maintenance staff, if a spill occurs InnServices follow all regulatory procedures to aid in clean up, collection of which would be in hazardous waste bins.
	Bypass installed between maintenance holes to prevent basement flooding, sewage overflows, and further spills.
Fleet	Vehicle oil changes between 5000 - 7000 km as per the owner's manual.
	Tire changes every winter and summer season and breakdown maintenance on an as needed basis.