TOWN OF BLIND RIVER
ASSET MANAGEMENT PLAN
WASTEWATER SYSTEM

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Document Control		Asset Management Plan			
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Contents

1.0 EXECUTIVE SUMMARY

1.1 The Purpose of the Plan

This Asset Management Plan (AM Plan) details information about infrastructure assets with actions required to provide an agreed level of service in the most cost-effective manner while outlining associated risks. The plan defines the services to be provided, how the services are provided and what funds are required to provide over the 10 year planning period. In the future, the AM Plan will link to a Long-Term Financial Plan which typically considers a 10 year planning period.

1.2 Asset Description

The Town of Blind River's water distribution system serves a population of approximately 2,500 residents.

Table 1.2 Wastewater Assets

Asset Segment	Asset Count	Unit of Measure	2024 Replacement Cost ($)
Fittings	1,477.00	each	123,900.00
Manholes	349.00	each	4,927,438.00
Sanitary Pumping Stations	4.00	each	2,117,700.00
Sewer Lines - Unknown	3.00	each	6,062,132.00
Sewer Lines 100-200mm	9,409.30	length (m)	21,641,390.00
Sewer Lines 201-300mm	15,009.90	length (m)	34,522,770.00
Sewer Lines 301-400mm	1,186.60	length (m)	2,514,720.00
Sewer Lines 401-500mm	707.10	length (m)	1,767,750.00
Sewer Lines 501mm and over	747.90	length (m)	1,869,750.00
Sewer Services	6,835.60	length (m)	11,620,520.00
Wastewater Treatment/Disposal Facility	1.00	each	4,871,510.00

The above infrastructure assets have replacement value estimated at $**92,039,580.00.**

1.3 Levels of Service

The allocation of funding in the planned budget is will dictate the performance of these assets and whether they continue providing existing services at current levels for the planning period.

The main service consequences of an insufficient Planned Budget are:

- Increased maintenance and repairs costs of wastewater assets.
- Increased replacement costs.
- Disruption to wastewater service for residents.

1.4 Future Demand

The factors influencing future demand and the impacts they have on service delivery are created by:

- Population growth and future housing development. These demands will be approached using a combination of managing existing assets, upgrading existing assets and providing new assets to meet demand.
- Demand management practices may also include a combination of non-asset solutions, insuring against risks and managing failures.
- Regulatory changes which will result in the a required increased level of service for wastewater assets.

These demands will be approached using a combination of managing existing assets, upgrading existing assets and providing new assets to meet demand. Demand management practices may also include a combination of non-asset solutions, insuring against risks and managing failures.

- The biggest component of the wastewater system is the sewer lines which are scheduled for replacement after 40 years of service to minimize repairs costs and asset failure. This timeframe can be extended or reduced based on condition assessments.
- Replacements of wastewater assets are completed in conjunction with the replacements of roads, and other underground services.
- Wastewater assets due for replacement will undergo a needs analysis to determine the if the replacement can be completed in conjunction with the replacement of other assets to minimize the cost.

1.5 Lifecycle Management Plan

1.5.1 What does it Cost?

The forecast lifecycle costs necessary to provide the services covered by this AM Plan includes operation, maintenance, renewal, acquisition, and disposal of assets. Although the AM Plan may be prepared for a range of time periods, it typically informs a Long-Term Financial Planning period of 10 years. Therefore, a summary output from the AM Plan is the forecast over the 10 years planning period, which for Fleet Assets is estimated as **$71,988,500** or **$ 7,198,850** on average per year. The following factors are reviewed prior to asset replacements:

- Condition and Usability determined through routine inspections and preventative maintenance by mechanic staff.
- Annual operating and repair costs taken from budget and in the future Citywide Maintenance Manager
- Age/Year of asset vs expected lifecycle

1.6 Financial Summary

1.6.1 What we will do

The infrastructure reality is that only what is funded in the long-term financial plan can be provided. The Informed decision making depends on the AM Plan emphasising the consequences of Planned Budgets on the service levels provided and risks. The total forecasted costs of the lifecycle of wastewater assets at current service levels is summarized in Figure 1.6.

Figure 1.6 Forecast Lifecycle Costs

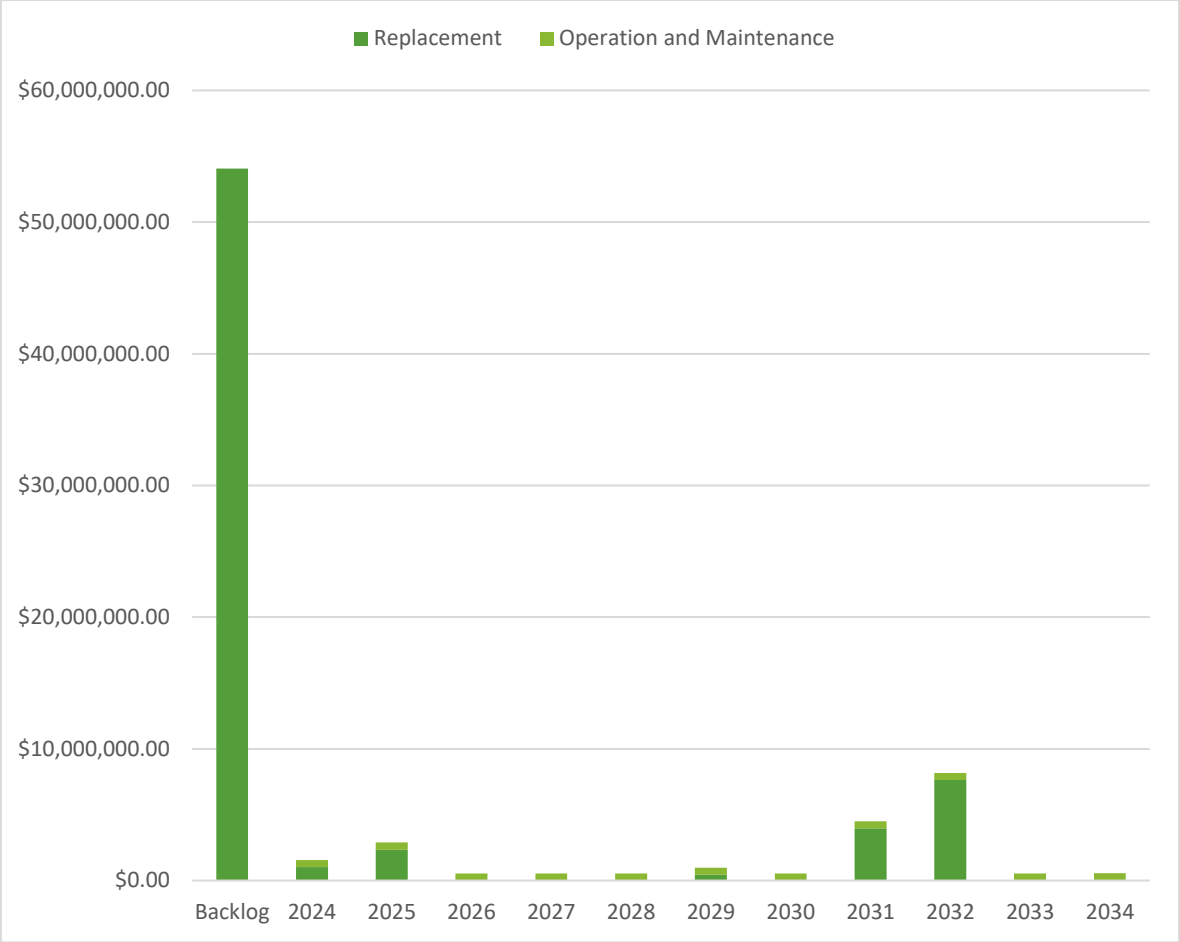


Figure Values are in current dollars.

We plan to provide wastewater asset services for approximately 2,500 residents:

- Maintenance and operation of Wastewater assets to ensure clean and safe disposal and treatment of Wastewater is supplied to residents.
- Replacement of assets before their end of usable life to prevent failure and disruption to the Wastewater service
- **The cost of this service is $71,988,500 within the 10 year planning period.**

1.6.2 What we cannot do

We currently do **not** allocate enough budget to sustain these services at the proposed standard or to provide all new services being sought. Works and services that cannot be provided under present funding levels are:

- Replacement of backlogged Wastewater assets which have exceeded their usable life
- Forecasted replacement of assets which will reach the end of their usable life during the planning period.

1.6.3 Managing the Risks

Our present budget levels are sufficient to continue to manage risks in the medium term.

The main risk consequences are:

- Reduction in the drinking wastewater service capacity due to insufficient raw wastewater supply caused by gaining wells.
- Disruption of drinking wastewater service to residents due to the break of critical supply mains.
- Loss of wastewater treatment capability due to the loss of critical treatment process components.

We will endeavour to manage these risks within available funding by:

- Completing the Pure Huron project to switch to Lake Huron as our primary wastewater source.
- Rehabilitation of wells as necessary to provide sufficient capacity until the transition to the new wastewater source is complete.
- Prioritization of the replacement of critical supply mains to minimize potential disruption of service to residents.

1.7 Asset Management Planning Practices

Key assumptions made in this AM Plan are:

- Service levels during the planning period will remain consistent with current levels.
- Future budgets will remain close to current funding levels.

Assets requiring renewal are identified from either the asset register or an alternative method.

- The timing of capital renewals based on the asset register is applied by adding the useful life to the year of acquisition or year of last renewal,
- Alternatively, an estimate of renewal lifecycle costs is projected from external condition modelling systems and may be supplemented with, or based on, expert knowledge.

The asset register and was used to forecast the renewal lifecycle costs for this AM Plan.

This AM Plan is based on a low to medium level of confidence information.

1.8 Monitoring and Improvement Program

The next steps resulting from this AM Plan to improve asset management practices are:

- Complete rebuild of the wastewater asset register to include material type and GIS information related to wastewater assets.

- Development of a condition assessment tool which will account for the condition of the road surface and other underground assets to prioritize full road reconstructions.
- Modify the estimated useable life of water mains to account for condition to further refine the age-based condition assessments.
- Incorporate field condition data in the condition assessment process.
- Incorporate sewer line material type into the asset register to further refine the estimated useful life based on material.

2.0 Introduction

2.1 Background

This AM Plan communicates the requirements for the sustainable delivery of services through management of assets, compliance with regulatory requirements, and required funding to provide the appropriate levels of service over the planning period.

The AM Plan is to be read with the Town of Blind River planning documents. This should include the Asset Management Policy and Asset Management Strategy, along with other key planning documents:

- 2024 Planned Budget

Comment on the current status of Asset Management in the Organisation.

The infrastructure assets covered by this AM Plan includes all wastewater system assets utilized to provide waste water collection and treatment to Blind River residents.

These assets are used to provide safe potable drinking water to the residents of Blind River.

The infrastructure assets included in this plan have a total replacement value of **$92,039,580**

Key stakeholders in the preparation and implementation of this AM Plan are shown in Table 2.1.

Table 2.1: Key Stakeholders in the AM Plan

Key Stakeholder	Role in Asset Management Plan
Council	■ Represent needs of community/shareholders, ■ Allocate resources to meet planning objectives in providing services while managing risks, ■ Ensure service sustainable.
Clerk's Department	■ Provide leadership with imbedding asset management practices across the organization. ■ Evaluate that adequate resources are available for development and implementation of AM initiatives ■ Ensure consistency of asset management approaches across the Town's Services Areas ■ Approve future plan revisions ■ Suggest budgetary, property tax/rate and Infrastructure Levy to Council.
Management Team	■ Recommends project selection criteria and weightings to Council.
PUC Staff/Public Works Staff	■ Report asset deficiencies and condition through routine inspection and preventative maintenance. ■ Complete maintenance and repair on the system as required. ■ Provide replacement recommendations based on condition.

2.2 Goals and Objectives of Asset Ownership

Our goal for managing infrastructure assets is to meet the defined level of service (as amended from time to time) in the most cost-effective manner for present and future consumers. The key elements of infrastructure asset management are:

- Providing a defined level of service and monitoring performance,
- Managing the impact of growth through demand management and infrastructure investment,
- Taking a lifecycle approach to developing cost-effective management strategies for the long-term that meet the defined level of service,
- Identifying, assessing and appropriately controlling risks, and
- Linking to a future Long-Term Financial Plan which identifies required, affordable forecast costs and how it will be allocated. This is planned to be developed in 2025.

Key elements of the planning framework are

- State of Local Infrastructure – current condition at the Town and replacement value of wastewater assets
- Levels of Service and continuous improvement– specifies the services and levels of service to be provided
- Asset Management Strategies like risk, disposal, lifecycle, and future demand and how this will impact on future service delivery and managing existing and future assets at defined levels of service
- Continuous Improvement and Monitoring – how the plan can be continuously improved and then monitored to ensure objectives are met. This also includes increasing the asset management maturity, identifying emerging technologies like improved materials the provide longer useful lives for assets.

Other references to the benefits, fundamentals principles and objectives of asset management are:

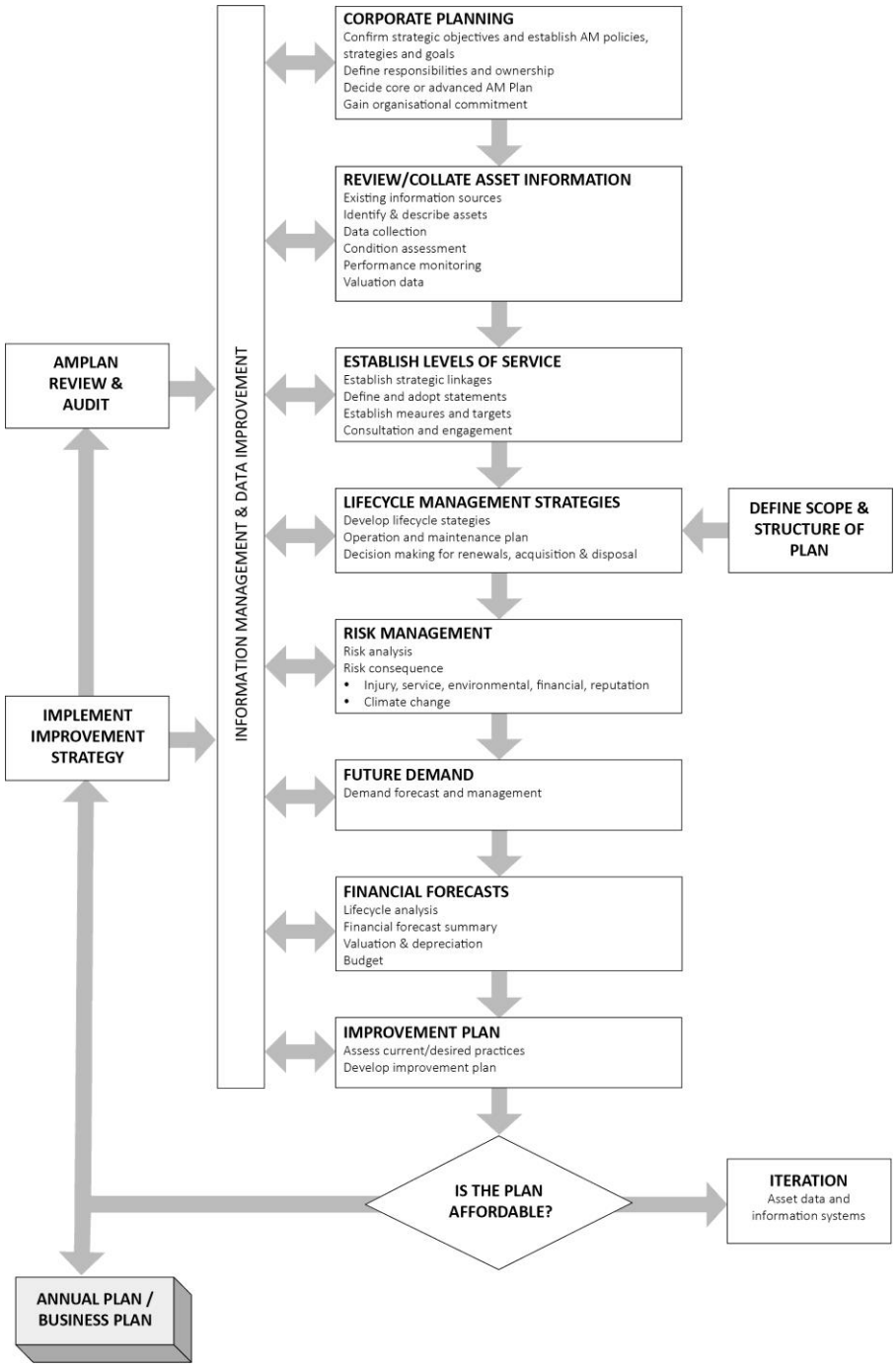
- ISO 55000[1]

A road map for preparing an AM Plan is shown below.

[1] ISO 55000 Overview, principles and terminology

Road Map for preparing an Asset Management Plan

Source: IPWEA, 2006, IIMM, Fig 1.5.1, p 1.11



3.0 STATE OF THE INFRASTRUCTURE

3.1 Asset Inventory and Valuation

Table 3.2 and Figure 3.2 below present the wastewater asset inventory in terms of 2024 replacement costs. All asset inventories originated from the town's GIS and asset register which houses information related to location, materials, installation year, quantities etc. Table 2.1 below provides the replacement cost of each asset presented in this AMP. These were provided by Tulloch engineering based on updated construction costs from projects which have taken place in 2024.

The Town wastewater assets are maintained by the Public Works department and PUC maintains the wastewater treatment which is contracted on behalf of the Town of Blind River. The water assets are broken down into their respective components. This categorization will be used in water system asset management planning and replacement forecasts.

Table 3.2 Wastewater Assets

Asset Segment	Asset Count	Unit of Measure	2024 Replacement Cost ($)
Fittings	1,477.00	each	123,900
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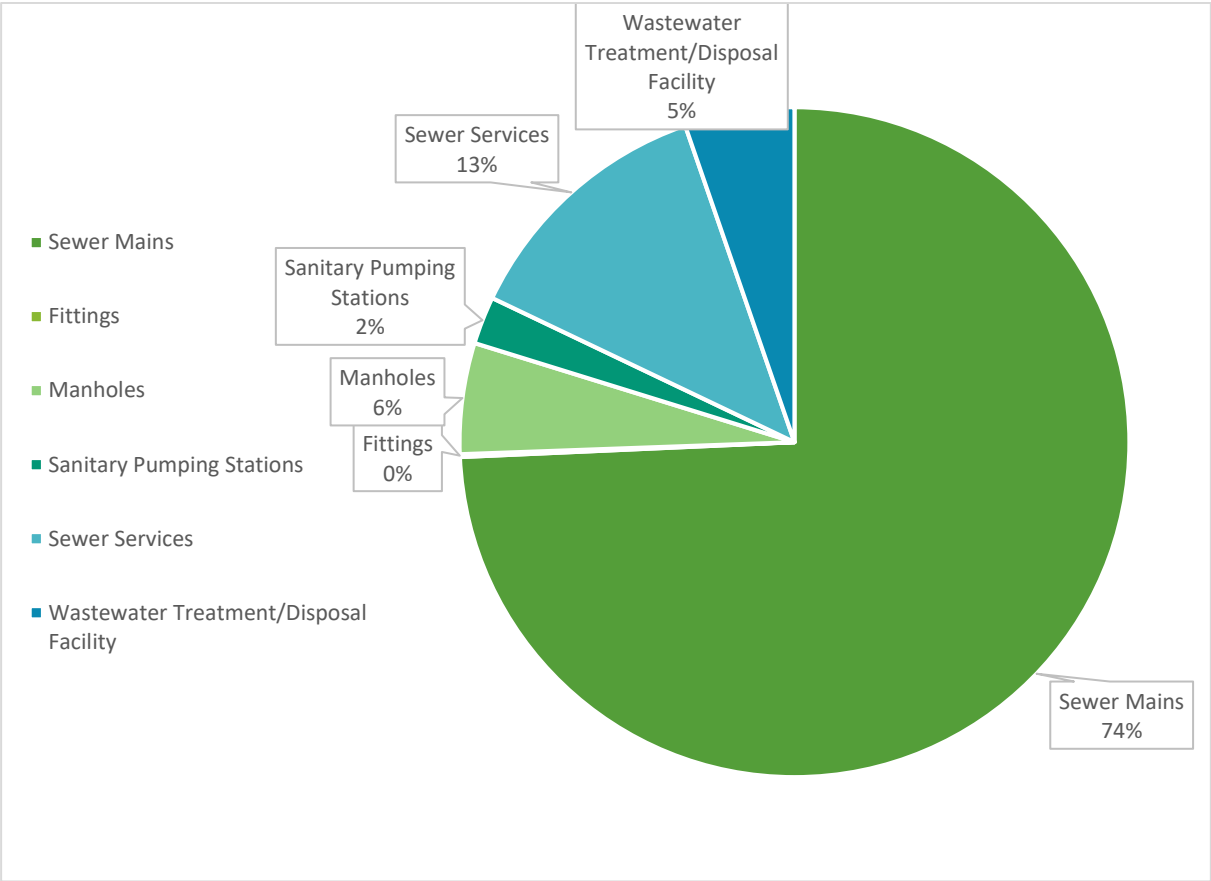
Sewer Services	6,835.60	length (m)	11,620,520
Wastewater Treatment/Disposal Facility	1.00	each	4,871,510
Total			92,039,580

As presented in Table 3.2, sewer mains are the most valuable assets covered in the Wastewater System, making up 74% of the total inventory value. There is approximately 27 km of sewer lines which are owned and operated by the municipality. Table 3.2 also includes the financial valuation for each asset category. These values are based on the cost of replacement and installation at 2024 costs. Figure 3.2 illustrates the replacement cost distribution of Wastewater assets.

Figure 3.2 Wastewater Assets Replacement Cost Distribution



3.2 Asset Age

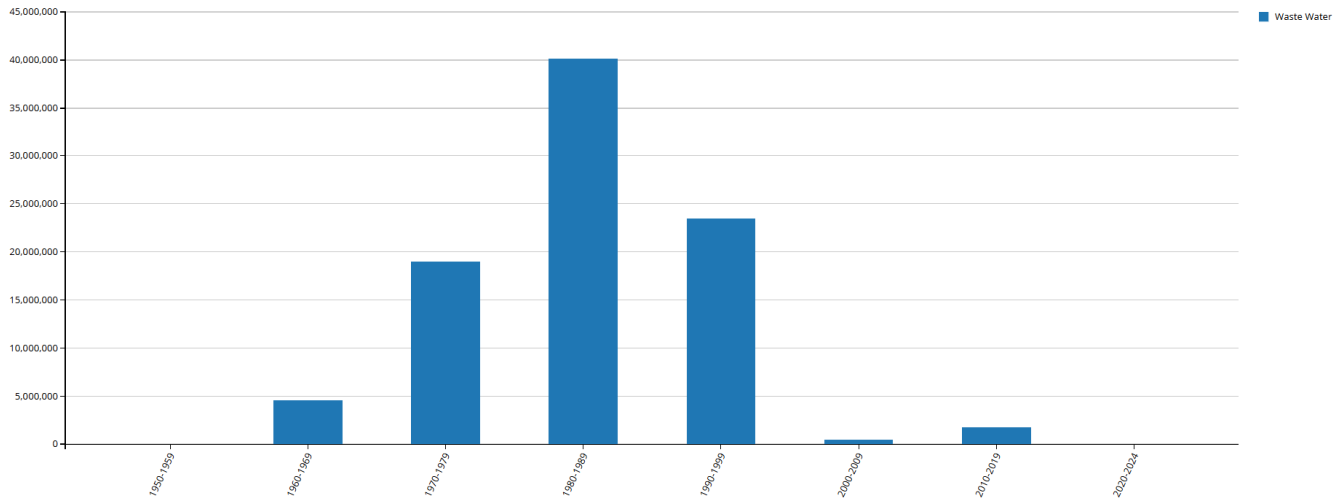
Asset age is an important factor in determining condition of some assets as well as when lifecycle interventions are necessary. For example, at the Town of Blind River, sewer lines are currently replaced when the begin to show signs of failure or poor flow.

For Wastewater asset categories, age can be used as a proxy for condition where visual condition data is unavailable. For example, visual condition data is difficult and costly to collect for water distribution mains since they are pressurized, small in diameter, and carry potable water which causes concern for contamination. As an alternative, the Public Services department plans to has develop a Condition Analysis Tool (CAT) to estimate the condition of watermains that considers age in combination with material, break history. criticality, and risk.

The series of figures on the following pages provides installation profiles in terms of 2024 replacement costs for watermains, valves, hydrants, and valve boxes and service leads. The transition from historical sewer line material to the current best practice of PVC can be seen through the decades, as well as times when significant investments. Those pipes installed in the 50s, 60s and 70s and the 80s are now nearing the end of their useful lives and may be beginning to deteriorate, resulting in large investments required in the coming years to replace or rehabilitate them.

The average age of all wasterwater assets is 40 years. The water asset age distribution is shown in Figure 3.3.1.

Figure 3.2.1 Wastewater Asset Installation Profile



3.3 Asset Condition Profile

The following figures present the current condition of the Water Utility infrastructure in terms of 2024 replacement costs. Condition was determined for watermains using based on the material and age of the watermain. In the future, this condition assessment will be further refined with the development of a Condition Analysis Tool which considers age, material, break history, risk, and criticality to calculate a condition score from 1 – 5. This information will be used in conjunction with the history of frozen services and shallow mains to determine condition and prioritize replacement.

In combination with condition scores for water, sanitary, storm and roads; these condition scores play an important role in determining when and where full reconstruction projects should take place and help inform the 10-year Capital Budget.

Instances where this would not necessarily apply would be with the replacement of a hydrant that was struck by a vehicle or severely damaged in some other fashion.

Condition of sanitary assets is determined based on their age and estimated remaining service life. Table 3.4 illustrates the relationship between remaining service life% and condition rating. Visual inspections are performed periodically via manholes to obtain flow and condition data which will be integrated into the condition assessment of these assets in future iterations of the plan.

Figure 3.3.1 Water Installation Profile

The average condition of wastewater assets is 1 out of 5 or very poor. The distribution of wastewater asset condition is shown in Figure 3.3.2.

Figure 3.3.2 Wastewater Asset Condition Distribution

As seen in figure 3.3.2 the town's wastewater assets are in very poor condition. There has been significant infrastructure reinvestment in the last few years which involved full sanitary system replacement on Huron Avenue and Woodward Avenue. These segments have be renewed to 'Very Good' condition as a result of recent construction but due to a technical issue with out asset register we were unable to update those assets for this iteration of the plan. These recent replacements will be reflected in the 2025 Wastewater AMP.

4.0 LEVELS OF SERVICE

4.1 Customer Research and Expectations

This AM Plan is prepared to facilitate consultation prior to adoption of levels of service by the Blind River Town Council. Future revisions of the AM Plan will incorporate customer consultation on service levels and costs of providing the service. This will assist the Blind River Town Council and stakeholders in matching the level of service required, service risks and consequences with the customer's ability and willingness to pay for the service.

4.2 Understand your customers

The Customer is defined as those who use or are impacted by activities associated with providing the wastewater services. The Town's sanitary sewer system provides wastewater treatment services to a population of approximately 2,350. The network includes a treatment plant, 27km of sewer lines, four pump stations, and other supportive assets.

Table 4.2.1 gives a snapshot of stakeholders and customer groups.

Table 4.2.1: Customer Groups and Stakeholders

Stakeholder	*Customer Groups*
Service Users	Blind River Residents
Regulatory Bodies	■ Ministry of the Environment, Conservation and Parks ■ Algoma Public Health
External Stakeholders	Council

4.3 Strategic and Corporate Goals

This AM Plan is prepared under the direction of the Town of Blind River vision, mission, goals and objectives.

Our vision is:

Driven by extraordinary volunteers and supported by its community leaders, Blind River is a vibrant and prosperous town that has established itself as a year-round destination and ideal community is which to live and do business.

Our mission is:

Providing quality services and leadership that reflect the social, cultural, environmental and economic needs of the community, while creating regional partnerships and managing resources in a fiscally responsible manner.

Strategic goals have been set by the Town of Blind River Asset Management Strategy. The relevant goals and objectives and how these are addressed in this AM Plan are summarised in Table 3.2.

Table 3.2: Goals and how these are addressed in this Plan

Goal	Objective	How Goal and Objectives are addressed in the AM Plan
Good Governance	Ensure the Town maintains the Levels of Service for Wastewater assets	Routine inspection and maintenance of wastewater assets in compliance with all regulatory requirements.
Environmental Sustainability	Lead in promoting and preserving our unique physical environment	Endeavour to maintain an environmentally conscious wastewater treatment operations continually strive for better performance.

4.4 Legislative Requirements

There are a number of legislative requirements that govern the levels of service provided for the Wastewater system. A summary of these is listed in table 4.2.

Table 4.4: Legislated Requirements

Legislation	Requirement
O. Reg. 588/17: ASSET MANAGEMENT PLANNING FOR MUNICIPAL INFRASTRUCTURE	These regulations outline the requirements for the following with respect to municipal road systems: • Inventory and Condition Assessment • Performance Monitoring and Reporting • Lifecycle Planning and Asset Valuation • Risk Assessment and Mitigation • Financial Planning and Budgeting • Stakeholder Engagement and Communication • Continuous Improvement and Review
Environmental Protection Act (EPA)	• Regulates pollutants, including those discharged into wastewater systems. • Provides enforcement mechanisms for illegal discharges and spills. • Governs the storage and handling of materials that could affect wastewater.
Ontario Water Resources Act	• Requires approvals (e.g., Environmental Compliance Approvals) for constructing and operating sewage works. • Prohibits the discharge of pollutants into water bodies without authorization. • Regulates stormwater management and industrial wastewater discharges.
Clean Water Act	• Requires source protection plans that can influence wastewater management practices. • Addresses threats from wastewater discharges near drinking water sources.
Safe Drinking Water Act (SDWA)	• Indirectly impacts wastewater by enforcing strict standards on the quality of water sources.
Lakes and Rivers Improvement Act	• Requires approvals for activities that might impact natural water systems, including wastewater effluent.
Wastewater Systems Effluent Regulations (WSER)	• Sets effluent quality standards for municipal and industrial wastewater systems across Canada.

4.5 Community Levels of Service

O.Reg 588/17 – Asset Management Planning for Municipal Infrastructure defines levels of service for core infrastructure classes that must be measured and reported on by all municipalities. Table 4.5.1 and Table 4.5.2 outline those that are included for water assets, adapted from Table 1 in the legislation.

Table 4.5.1: Community Level of Service Measures

Service Attribute	Customer Levels of Service	Current Performance
Scope	Description, which may include maps, of the user groups or areas of the municipality that are connected to the municipal wastewater system	Map provided
Reliability	Description of how combined sewers in the municipal wastewater system are designed with overflow structures in place which allow overflow during storm events to prevent backups into homes	TBD
	Description of the frequency and volume of overflows in combined sewers in the municipal wastewater system that occur in habitable areas or beaches	There are no know incidents of this type of overflow in the Town of Blind River
	Description of how stormwater can get into sanitary sewers in the municipal wastewater system, causing sewage to overflow into streets or backup into homes	Stormwater can enter into sanitary sewers due to cracks in sanitary mains or through indirect connections (e.g., weeping tiles). In the case of heavy rainfall events, sanitary sewers may experience a volume of water and sewage that exceeds its designed capacity. In some cases, this can cause water and/or sewage to overflow or backup into homes. The disconnection of weeping tiles from sanitary mains and the use of sump pumps and pits directing storm water to the storm drain system can help to reduce the chance of this occurring.
	Description of how sanitary sewers in the municipal wastewater system are designed to be resilient to stormwater infiltration	The municipality follows a series of design standards that integrate 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 and backups.

Reliability	Description of the effluent that is discharged from sewage treatment plants in the municipal wastewater system	Effluent refers to water pollution that is discharged from a wastewater treatment plant, and may include suspended solids, total phosphorous and biological oxygen demand. The Environmental Compliance Approval (ECA) identifies the effluent criteria for municipal wastewater treatment plants.

Table 4.5: Wastewater System Service Area

4.6 Technical Levels of Service

Technical Levels of Service – To deliver on the Community Levels of Service, are operational or technical measures of performance. These technical measures relate to the activities and allocation of resources to best achieve the desired customer outcomes and demonstrate effective performance.

Technical Levels of Service apply to internal stakeholders such as staff, or senior management. The Technical LOS (Levels of Service) description is a brief statement summarizing measures related to operation and maintenance of an asset.

Levels of Service for wastewater are the financial sustainability of operating and maintenance (O&M) costs and sustainability of providing this service.

Technical service measures are linked to the activities and annual budgets covering:

- **Acquisition** – the activities to provide a higher level of service (e.g. widening a road, sealing an unsealed road, replacing a pipeline with a larger size) or a new service that did not exist previously (e.g. a new library).
- **Operation** – the regular activities to provide services (e.g. opening hours, cleansing, mowing grass, energy, inspections, etc.
- **Maintenance** – the activities necessary to retain an asset as near as practicable to an appropriate service condition. Maintenance activities enable an asset to provide service for its planned life (e.g. road patching, unsealed road grading, building and structure repairs),

- **Renewal** – the activities that return the service capability of an asset up to that which it had originally provided (e.g. road resurfacing and pavement reconstruction, pipeline replacement and building component replacement),

The following table outlines the quantitative metrics that determine the technical level of service provided by the Wastewater system.

Table 4.5.2: Technical Level of Service Measures

Service Attribute	Technical Level of Service	Current Performance
Scope	% of properties connected to the municipal water system	66%
Reliability	# 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	0.0018 (2 events over 1,120 properties)
	# of connection-days per year having wastewater backups compared to the total number of properties connected to the municipal wastewater system	0
	# of effluent violations per year due to wastewater discharge compared to the total number of properties connected to the municipal wastewater system	0.0009 (1 effluent violation over 1,120 properties)

It is important to monitor the service levels regularly as circumstances can and do change. Current performance is based on existing resource provision and work efficiencies. It is acknowledged changing circumstances such as technology and customer priorities will change over time.

5.0 FUTURE DEMAND

5.1 Demand Drivers

Drivers affecting demand include things such as population change, regulations, changes in demographics, seasonal factors, vehicle ownership rates, consumer preferences and expectations, technological changes, economic factors, agricultural practices, environmental awareness, etc. Demand drivers affecting wastewater assets are generally triggered by growth in the Town services or responsibilities, technological changes, economic factors and, environmental awareness, etc. Growth in the Town and construction of new housing will trigger a growth in the Wastewater system.

5.2 Demand Forecasts

The present position and projections for demand drivers that may impact future service delivery and use of assets have been identified and documented.

5.3 Demand Impact and Demand Management Plan

The impact of demand drivers that may affect future service delivery and use of assets are shown in Table 5.3.

Demand for new services will be managed through a combination of managing existing assets, upgrading of existing assets and providing new assets to meet demand and demand management. Demand management practices can include non-asset solutions, insuring against risks and managing failures.

Opportunities identified to date for demand management are shown in Table 5.3. Further opportunities will be developed in future revisions of this AM Plan.

Table 5.3: Demand Management Plan

Demand driver	Current position	Projection	Impact on services	Demand Management Plan
Climate Change	No consideration of the impacts of climate change are currently considered in future demand of the Wastewater system.	N/A	N/A	N/A
Population Growth	A process doesn't currently exist to monitor and forecast the impacts of growth on service delivery.	Population will increase slowly	The level of service will decrease slowly over time in relation to population growth.	Establish a process for monitoring and forecasting population growth to proactively plan for required expansion of wastewater network
Regulatory Changes	The process of addressing changing regulations proactive.	New regulations related to Wastewater will be introduced.	The cost of operation and maintenance of Wastewater assets will increase to meet new regulatory requirements.	Monitor industry and regulatory trends, address anticipated changes proactively prior to the ratification of regulatory requirement.

5.4 Asset Programs to meet Demand

The new assets required to meet demand may be acquired, donated or constructed. Additional assets are discussed in Section 5.4.

Acquiring new assets will commit the Town of Blind River to ongoing operations, maintenance and renewal costs for the period that the service provided from the assets is required. These future costs are identified and considered in developing forecasts of future operations, maintenance and renewal costs for inclusion in the future long-term financial plan.

5.5 Climate Change Adaptation

The impacts of climate change may have a significant impact on the assets we manage and the services they provide. In the context of the Asset Management Planning process climate change can be considered as both a future demand and a risk.

How climate change impacts on assets will vary depending on the location and the type of services provided, as will the way in which we respond and manage those impacts.

Additionally, the way in which we construct new assets should recognize that there is opportunity to build in resilience to climate change impacts. Climate-resilient assets can accommodate or quickly recover from disruptions caused by severe climate events or chronic climate stresses, reducing the likelihood of a damaging or irreversible impact. Building resilience can have the following benefits:

• Assets will withstand the impacts of climate change;

• Services can be sustained; and

• Assets that can endure may potentially lower the lifecycle cost and reduce their carbon footprint

The impact of climate change on assets is a new and complex discussion and further opportunities will be developed in future revisions of this AMP. The impact of climate change on assets is a new and complex discussion and further opportunities will be developed in future revisions of this AM Plan.

5.6 Climate Change Impacts

Climate change impacts specific to the municipality of Blind River and surrounding areas include more extreme weather events and warmer temperatures in the winter. These extreme weather events in the Blind River area have resulted in an increase in short duration-high volume precipitation events which stress the treatment capacity of our existing facility. A preliminary design of upgrades to address treatment capacity restraints has been completed and an application for grant funding to fund this issue.

6.0 LIFECYCLE MANAGEMENT PLAN

6.1 Lifecycle Management Activities

The lifecycle management plan discussed in the following subsections are the activities undertaken by the Town of Blind River to uphold the levels of service presented in Section 4. These activities can include plan or unplanned work that is done to ensure the water distribution system can meet the demands and expectations of customers. When planned for and executed well, these activities can save money and extend the useful life of an asset.

Different municipalities use different terms to categorize these activities. Table 6.1 below is how Town of Blind River has chosen to define them for water assets. This table also provides examples specific to the Water Utility as well as their average costs from 2020-2024.

Table 6.1: Lifecycle Management Activities

Lifecycle Management Activity	Definition	Examples	5-Year Average Costs
Operations/Maintenance	Regularly scheduled inspections and maintenance or repairs associated with unexpected events.	▪ MaintenanceMain flushing is completed on an annual basis, with rodding as required. ▪ The cost of flushing is estimated to be $200 per metre, and represents a significant operating cost to the municipality. ▪ Repair of leaks and minor breaks	$ 473,174
Renewal/Replacement	Significant repairs to extend the life of an asset. This includes a replacement of an asset at end of life but does no accommodate a change in service.	▪ . Rehabilitations and replacements are guided by CCTV inspections, site-specific e.g., blockage events, and opportunities to coordinate with roadway projects. ▪ The service life of mains and type of material also provide guidance on the timing of any replacement activities.	$ 482,100
Non-infrastructure Solutions	Actions or policies that lower costs, extend the life of an asset or identify asset needs.	▪ Sewer line break/back-up reporting process ▪ Future revision of water/sewer fee structure to encourage large	$1,000

		consumers to reduce their consumption of water which correlates to a reduce in wastewater production.	

6.2 Asset capacity and performance

Assets are generally provided to meet design standards where these are available. However, there is insufficient resources to address all known deficiencies. Locations where deficiencies in service performance are known are detailed in Table 6.2.

Table 6.2: Known Service Performance Deficiencies

Asset	Service Deficiency
Wast Water Treatment Facility	The facility currently does not have sufficient capacity to handle peak flow events. These evens result in a bypass of secondary treatment.
Hanes Sanitary Line	The sewer line under the train tracks on Hawkins has been identified to have failed and requires repair/replacement.

The above service deficiencies were identified from the review of sewer camera inspection and routine field inspection.

6.3 Operations and Maintenance Plan

Operations include regular activities to provide services. Examples of typical operational activities include, uni-directional flushing, asset inspection, and utility costs.

Maintenance includes all actions necessary for retaining an asset as near as practicable to an appropriate service condition including regular ongoing day-to-day work necessary to keep assets operating. Examples of typical maintenance activities include pipe repairs, asphalt patching, and equipment repairs.

The trend in maintenance budgets is shown in Table 6.3.1.

Table 6.3.1: Maintenance Budget Trends

Year	Maintenance Budget $
2020	$ 420,000
2021	$ 436,000
2022	$ 476,020
2023	$ 488,075
2024	$ 545,775

The 5-year average operating budget for wastewater system maintenance is **$ 473,174**. Maintenance budget levels are considered to be adequate to meet projected service levels, which may be less than or equal to current service levels. **The required maintenance budget is expected to increase until the renewal budget of wastewater assets is increased to meet the forecasted requirements.**

Where maintenance budget allocations are such that they will result in a lesser level of service, the service consequences and service risks have been identified and are highlighted in this AM Plan and service risks considered in the Risk Management section of this plan.

Assessment and priority of reactive maintenance is undertaken by staff using experience and judgement.

Summary of forecast operations and maintenance costs

Forecast operations and maintenance costs are expected to vary in relation to the total value of the water assets. If additional wastewater assets are acquired, the future operations and maintenance costs are forecasted to increase. If assets are disposed of the forecast operation and maintenance costs are expected to decrease.

We have seen a 30% increase in maintenance costs of the waste waster system over the last 5 years. This increase is likely slightly reduced due to a large portion of wastewater system operations being performed by PUC staff as part of a long-term contract. An increase in O&M costs is expected to occur when these contracts are renegotiated. In the last year this inflation has normalized to roughly 2.5%[2]. The water system is not expected to see growth over the ten-year planning period but the cost of maintenance is expected to increase as waste waster asset condition continues to deteriorate.

6.4 Maintenance Activities

Maintenance activities are those that maintain the current level of service provided by an asset. These activities ensure that the waste water system is reliable and consistently delivers waste collection and treatment.

6.5 Renewal Plan

Renewal is major capital work which does not significantly alter the original service provided by the asset, but restores, rehabilitates, replaces or renews an existing asset to its original service potential. Work over and above restoring an asset to original service potential is considered to be an acquisition resulting in additional future operations and maintenance costs.

Linear wastewater infrastructure is planned for replacement in the 10-year capital forecast. Sewer line replacements are done as either full reconstruction projects or wastewater only replacement projects.

Full reconstructions include the replacement of wastewater infrastructure along with storm, sanitary and the overlying road. In the near future, these projects are planned according to combined condition scores for all the asset classes in a particular section of road (water – 30%, sanitary – 35%, storm – 20%, roads – 10%).

These scores will be determined using a Condition Analysis Tool (CAT) developed by the Public Services department. This tool will help move away from strictly age-based decision making to a more holistic approach. When a full reconstruction occurs, costs are shared between the three utilities (water – 31%, sanitary – 46%, storm – 23%). The water portion of the costs includes the replacement of sewer lines, appurtenances and a portion of the costs associated with road reconstruction. In areas where the waste water infrastructure is in poor condition but water and storm remain in good condition, sewer only replacement projects may be scheduled. The typical useful lives of assets used to develop projected asset renewal forecasts are shown in Table 6.4. Asset useful lives were last reviewed on December 2024.

[2] Statista Research Department, & 4, D. (2024). Canada: inflation rate and bank rate monthly 2024. Retrieved from https://www.statista.com/statistics/1312251/canada-inflation-rate-bank-rate-monthly/#:~:text=Canada's%20inflation%20rate%20and%20bank,2.5%20percent%20by%20October%202024.

Table 6.4: Useful Lives of Assets

Asset (Sub)Category	Useful life
Sewer Lines	40 years
Sewer Services	80 years
Treatment and Disposal Equipment	20 years
Manholes	25 years
Fittings	40 years

The estimates for renewals in this AM Plan were based on the asset register the town maintains in PSDCitywide. The asset register currently lacks material information for sewer line material. The construction material of the sewer line can greatly impact the useful life of that segment. The sewer line material will be incorporated into the asset register and useful lives further refined in future iterations of this asset management plan.

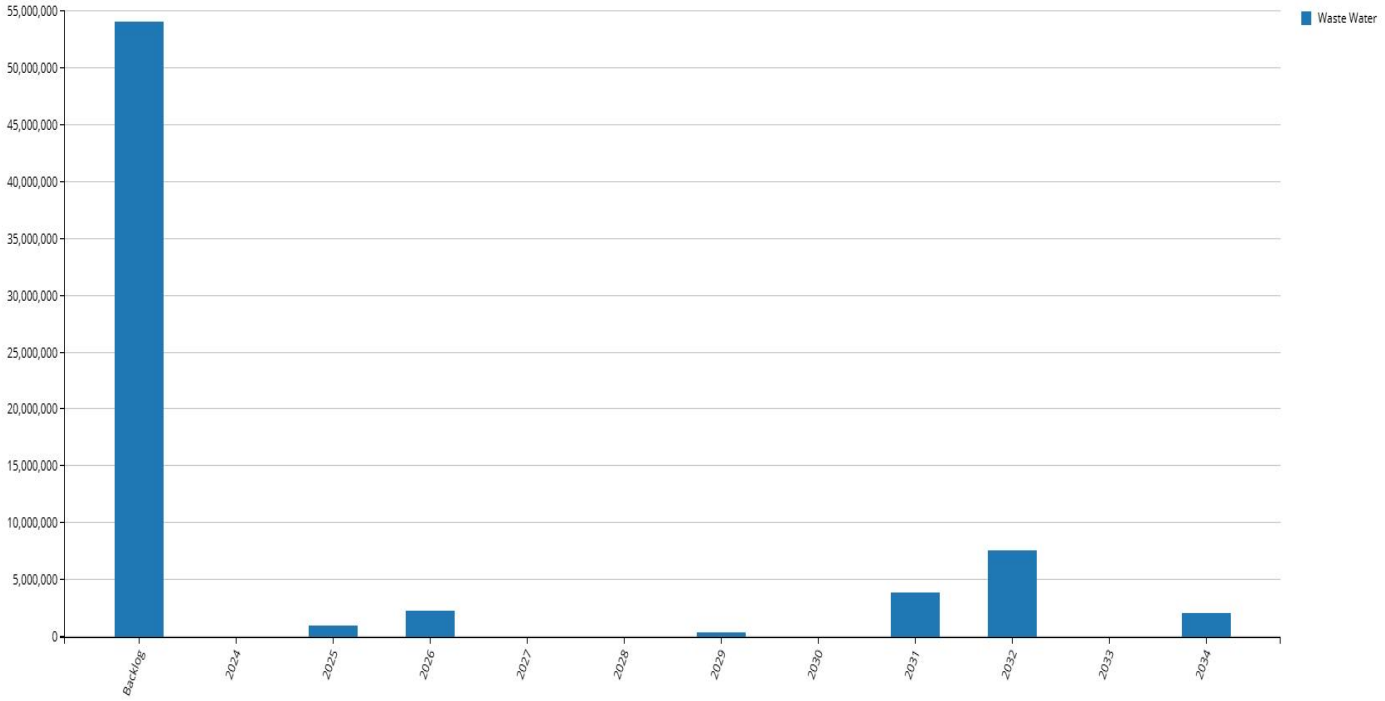
6.6 Summary of future renewal costs

The total replacement cost of the wastewater assets is $ **$92,039,580**. The forecasted replacement costs during the 10-year planning period of the Wastewater Asset Management Plan are **$ 66,530,753 or $6,653,075** annually over the planning period.

In addition to the forecasted replacements there is significant backlog of water assets which have excessed their estimated usable life. These are water assets that should have been replaced in the past but were deferred. The value of the replacement backlog is **$51,560,175**. It is not feasible to renew the backlogged assets in a single year but these assets should be added to future capital investment to prevent imminent failure.

These forecasted replacements are displayed in Figure 6.6

Figure 6.6: Forecast Renewal Costs



All figure values are shown in current day dollars.

The forecast renewals vary significantly from year to year with 2031 and 2032 and 2032 being high years of reinvestment.

Recommended best practice would be to adjust the capital budget to meet the forecasted annual requirement during the planned period to address the infrastructure backlog and planned renewals evenly throughout the planned period.

6.7 Acquisition Plan

Acquisition reflects are new assets that did not previously exist or works which will upgrade or improve an existing asset beyond its existing capacity. They may result from growth, demand, social or environmental needs.

There are no acquisitions planned for wastewater assets at the current time. In 2026, increases to services may be proposed when the proposed service levels are completed. Wastewater asset acquisitions may be required to meet the increased levels of service and the proposed budget will need to be increased to reflect these changes.

6.8 Disposal Plan

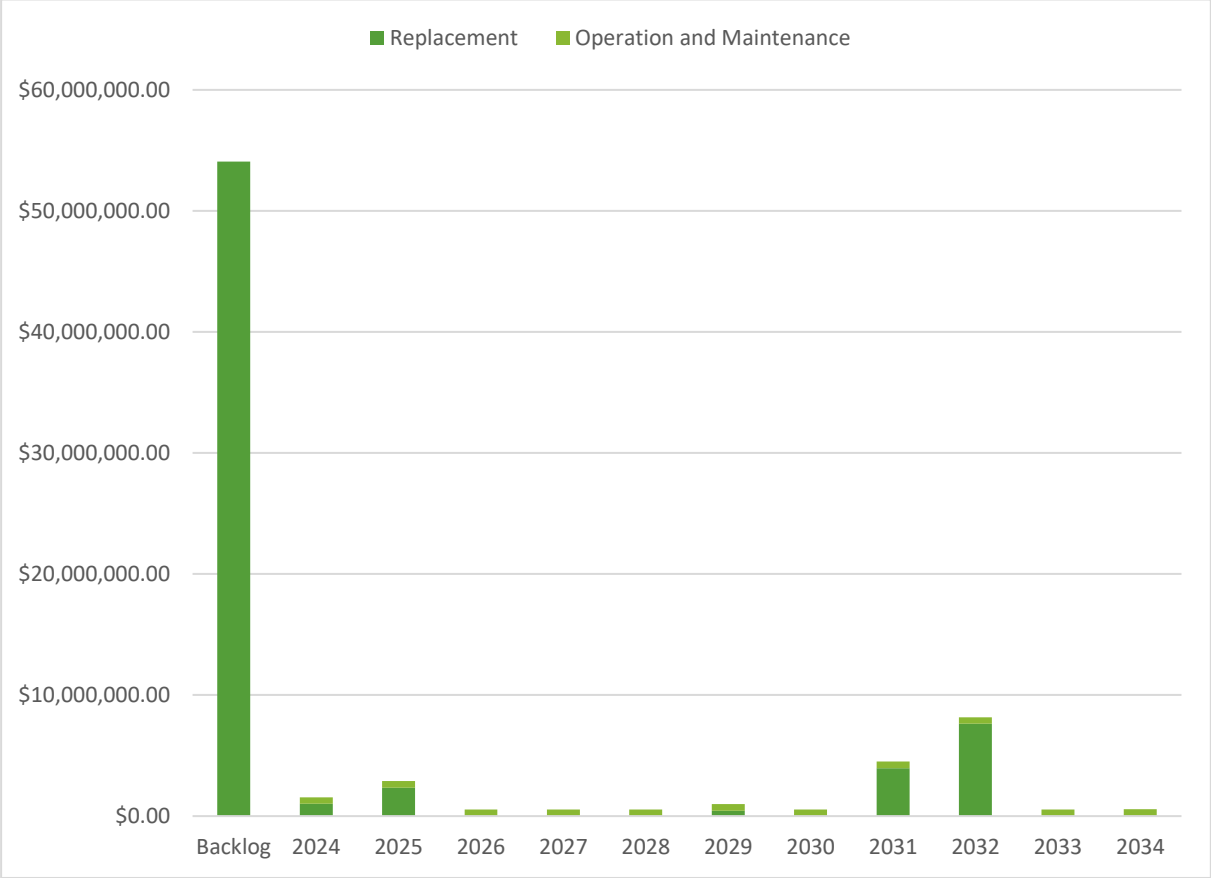
Disposal includes any activity associated with the disposal of a decommissioned asset including sale, demolition or relocation. There are currently no assets identified for possible decommissioning and disposal.

6.9 Summary of asset forecast costs

The financial projections from this asset plan are shown in Figure 6.8.1. These projections include forecast costs for acquisition, operation, maintenance, renewal, and disposal. These forecast costs are shown relative to the proposed budget.

The bars in the graphs represent the forecast costs needed to minimise the life cycle costs associated with the service provision. The gap between the forecast work and the proposed budget is the basis of the discussion on achieving balance between costs, levels of service and risk to achieve the best value outcome.

Figure 6.8.1: Lifecycle Summary



All figure values are shown in current day dollars.

The planned annual budget for water assets will need to meet requirements of the future lifecycle forecasts for these assets to maintain the current level of service that these assets provide to the municipality and the departments who use them. The average annual reinvestment to meet replacements, operation and maintenance costs is **$ 7,197,850**. The current budget is insufficient to meet the total lifecycle costs of wastewater assets during the planned period.

7.0 RISK MANAGEMENT PLANNING

The purpose of infrastructure risk management is to document the findings and recommendations resulting from the periodic identification, assessment and treatment of risks associated with providing services from infrastructure, using the fundamentals of International Standard ISO 31000:2018 Risk management – Principles and guidelines.

Risk Management is defined in ISO 31000:2018 as: 'coordinated activities to direct and control with regard to risk.

An assessment of risks associated with service delivery will identify risks that will result in loss or reduction in service, personal injury, environmental impacts, a 'financial shock', reputational impacts, or other consequences. The risk assessment process identifies credible risks, the likelihood of the risk event occurring, and the consequences should the event occur. The risk assessment should also include the development of a risk rating, evaluation of the risks and development of a risk treatment plan for those risks that are deemed to be non-acceptable.

7.1 Critical Assets

Critical assets are defined as those which have a high consequence of failure causing significant loss or reduction of service. Critical assets have been identified and along with their typical failure mode, and the impact on service delivery, are summarised in Table 7.1. Failure modes may include physical failure, collapse or essential service interruption.

Table 7.1 Critical Assets

Critical Asset(s)	Failure Mode	Impact
Treatment Facility	Failure of critical components required for treatment.	Temporary loss of Wastewater service.
Critical main break	Main break on sections of main servicing areas without dual supply.	Loss of waste collection service

By identifying critical assets and failure modes an organisation can ensure that investigative activities, condition inspection programs, maintenance and capital expenditure plans are targeted at critical assets.

7.2 Risk Assessment

The risk management process used is shown in Figure 7.2.1 below.

It is an analysis and problem-solving technique designed to provide a logical process for the selection of treatment plans and management actions to protect the community against unacceptable risks.

The process is based on the fundamentals of International Standard ISO 31000:2018.

Fig 7.2.1 Risk Management Process – Abridged
Source: ISO 31000:2018, Figure 1, p9

The risk assessment process identifies credible risks, the likelihood of the risk event occurring, the consequences should the event occur, development of a risk rating, evaluation of the risk and development of a risk treatment plan for non-acceptable risks.

The Town's Asset Management Risk Strategy provides a detailed description of consequence and risk scores which have been incorporated into the Town's Asset Management technology; Citywide. The probability of failure is based on the condition of the assets shown in Figure 7.2.2. The consequence of failure helps in determining the impact if failure does occur as shown in Figure7.2.3. The consequence and probability together provide risk scores for each of the wastewater assets. Figure 7.2.4 is the risk matrix for the Town.

Table 7.2.2 Probability of Failure Model

	Structural 100%		
Condition 50%		Service life Remaining 40%	Pipe Material 10%

Table 7.2.3 Consequence of Failure Model

Direct Financial 60%	Replacement Cost 100%
Economic 20%	Pipe Diameter 100%
Social 20%	Asset Type 50% Pipe Diameter 50%

An assessment of risks associated with service delivery will identify risks that will result in loss or reduction in service, personal injury, environmental impacts, a 'financial shock', reputational impacts, or other consequences.

Table 7.2.4 Risk Matrix

►Low to Medium probability of failure ►Medium to High asset criticality **Proactive Management**, e.g., preventative maintenance and monitoring	►Medium to Very High probability of failure ►Medium to Very High asset criticality **Immediate Action**, e.g., inspect, repair, rehabilitate, or replace
►Low to Medium probability of failure ►Low to Medium to High asset criticality **Monitoring**, e.g., routine inspections	►Medium to Very High probability of failure ►Low to Medium asset criticality **Monitoring**, e.g., more detailed/frequent inspections, and plan for failures

Critical risks are those assessed with 'Very High' (requiring immediate corrective action) and 'High' (requiring corrective action) risk ratings identified in this plan. The residual risk and treatment costs of implementing the selected treatment plan are reported in each plan. It is essential that these critical risks and costs are reported to management and the Town Council. There are currently no High or Very High risks associated with wastewater assets.

A complete summary of identified risks will be summarized in future iterations of this plan.

7.3 Infrastructure Resilience Approach

The services provided by water assets can be impacted by the disruption from natural disasters, infrastructure failures, and human threats. The resilience of our critical infrastructure is vital to the ongoing provision of services to customers. To adapt to changing conditions we need to understand our capacity to withstand a given level of stress or demand, and to respond to possible disruptions, and to ensure continuity of service. The consequences of disruptive events can be minimized by pre-emptively replacing assets at end of life, and utilizing more resilient materials for renewals of water mains.

Our current measure of resilience is shown in Table 7.3 which includes the type of threats and hazards and the current measures that the organization takes to ensure service delivery resilience. Taking a risk-informed approach to resilience planning allows the Public Services department to proactively protect wastewater assets and mitigate damage at the time of emergency or in the aftermath of a disruptive event. Our current measures of resilience is shown in Table 7.3 which includes the type of threats and hazards and the current measures that the organisation takes to ensure service delivery resilience.

Table 7.3: Resilience Assessment

Threat / Hazard	Assessment Method
sewer line failure resulting in loss of wastewater collection service	# of breaks pipe material and age
Failure of critical treatment components	Spares or replacement equipment is kept available for all critical equipment within the treatment process
Insufficient capacity for treatment	Work is currently underway to increase the capacity at the WWTP to handle peak flows.

7.4 Service and Risk Trade-Offs

The decisions made in adopting this AM Plan are based on the objective to achieve the optimum benefits from the available resources.

Future iterations of the asset management plan will include:

- Incorporation of risk generated from our asset register for each wastewater asset and use this factor for replacement prioritization
- Improved understanding of asset criticality in each department through the organization wide implementation of Maintenance Manager (CMMS)

7.4.1 Service trade-off

If there is forecast work (operations, maintenance, renewal, acquisition or disposal) that cannot be undertaken due to available resources, then this will result in service consequences for users. There are no anticipated service trade-offs that will be required during the planning period.

7.4.2 Risk trade-off

The operations and maintenance activities and capital projects that cannot be undertaken may sustain or create risk consequences. There are no anticipated risk trade-offs that will be required during the planning period.

8.0 Forecast Reliability and Confidence

The forecast costs, proposed budgets, and valuation projections in this AM Plan are based on the best available data. For effective asset and financial management, it is critical that the information is current and accurate. Data confidence is classified on a A - E level scale[3] in accordance with Table 7.5.1.

Table 7.5.1: Data Confidence Grading System

Confidence Grade	Description
A. Very High	Data based on sound records, procedures, investigations and analysis, documented properly and agreed as the best method of assessment. Dataset is complete and estimated to be accurate ± 2%
B. High	Data based on sound records, procedures, investigations and analysis, documented properly but has minor shortcomings, for example some of the data is old, some documentation is missing and/or reliance is placed on unconfirmed reports or some extrapolation. Dataset is complete and estimated to be accurate ± 10%
C. Medium	Data based on sound records, procedures, investigations and analysis which is incomplete or unsupported, or extrapolated from a limited sample for which grade A or B data are available. Dataset is substantially complete but up to 50% is extrapolated data and accuracy estimated ± 25%
D. Low	Data is based on unconfirmed verbal reports and/or cursory inspections and analysis. Dataset may not be fully complete, and most data is estimated or extrapolated. Accuracy ± 40%
E. Very Low	None or very little data held.

The estimated confidence level for and reliability of data used in this AM Plan is shown in Table 7.5.2.

Table 7.5.2: Data Confidence Assessment for Data used in AM Plan

Data	Confidence Assessment	Comment
Demand drivers	Medium	Demands are forecasted based on future developments
Growth projections	High	Growth is based a recent population and housing report completed by CanCensus
Acquisition forecast	High	There are currently no planned increases to Levels of Service
Operation forecast	Medium	
Maintenance forecast	Medium	
Renewal forecast - Asset values	Low	Significant work is required to rebuild the water asset register to improve forecasted costs and ensure accuracy of replacements.
- Asset useful lives	Medium	Additional information will further refine these in future plans.
- Condition modelling	Low	Condition modelling will be greatly improved by the addition of the material type for linear infrastructure.
Disposal forecast	High	

The estimated confidence level for and reliability of data used in this AM Plan is considered to be medium – high.

[3] IPWEA, 2015, IIMM, Table 2.4.6, p 2|71.

9.0 PLAN IMPROVEMENT AND MONITORING

9.1 Status of Asset Management Practices[4]

9.1.1 Accounting and financial data sources

This AM Plan utilises accounting and financial data. The source of the data is planned budgets and historical expenditures.

9.1.2 Asset management data sources

This AM Plan utilises asset register data. The source of the data is the field collected data, the town's GIS system and the asset register maintained in Citywide.

9.2 Improvement Plan

It is important that an entity recognise areas of their AM Plan and planning process that require future improvements to ensure effective asset management and informed decision making. The improvement plan generated from this AM Plan is shown in Table 9.2.

Table 9.2: Improvement Plan

Task	Task	Responsibility	Resources Required	Timeline
1	Refine lifecycle forecasts to include the cost of annual camera inspection.	Director of Public Services	Staff time	2 months
2	Further expand levels of service beyond what is legislated.	Director of Public Services	N/A	2 months
3	Update O&M forecasts to reflect known contract costs with PUC.	Director of Public Services and Finance	PUC contract financial information from last 5 years.	2 months
4	Assign pipe material to sewer line segments to further refine condition assessments based on remaining estimated usable life.	Director of Public Services	Update of pipe material	3 months
5	Coordinate wastewater asset inventory with field updates and completed renewals via GIS to ensure accuracy of the asset inventory.	Director of Public Services	Replacement of the water asset inventory.	3 months
6	Update on field condition of wastewater linear assets.	Director of Public Services	Sewer inspection reports, staff time.	3 months

9.3 Monitoring and Review Procedures

This AM Plan will be reviewed during the annual budget planning process and revised to show any material changes in service levels, risks, forecast costs and proposed budgets as a result of budget decisions.

The AM Plan will be reviewed and updated annually to ensure it represents the current service level, asset values, forecast operations, maintenance, renewals, acquisition and asset disposal costs and planned budgets. These forecast costs and proposed budget are incorporated into the Long-Term Financial Plan or will be incorporated into the Long-Term Financial Plan once completed.

[4] ISO 55000 Refers to this as the Asset Management System

The AM Plan has a maximum life of 4 years and is due for complete revision and updating within 1 year of each Town Council election.

9.4 Performance Measures

The effectiveness of this AM Plan can be measured in the following ways:

- The degree to which the required forecast costs identified in this AM Plan are incorporated into the future long-term financial plan,
- The degree to which the 1-5 year detailed works programs, budgets, business plans and corporate structures consider the 'global' works program trends provided by the AM Plan,
- The degree to which the existing and projected service levels and service consequences, risks and residual risks are incorporated into the Strategic Planning documents and associated plans,
- The Asset Renewal Funding Ratio achieving the Organisational target (this target is often 90 – 100%). This will be review in future iterations of the plan.

10.0 REFERENCES

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