TOWN OF BLIND RIVER
ASSET MANAGEMENT PLAN
DRINKING WATER SYSTEM

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Document Control		Asset Management Plan			
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1.0	December 2024	Initial Plan	C. Zagar	K. Scott/S. Dent	Council

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 Drinking Water Assets

Asset Segment	Asset Count	**2024 Replacement Cost ($)**
Control Valves	1,212 each	$3,277,186
Hydrants	197 each	$2,557,179
Service Leads	8,536 m	$15,730,290
Treatment Plant	1 each	$16,379,090
Valve Box	1,196 each	$451,500
Water Mains	34,131 m	$100,957,121
Water Treatment Equipment	17.00	$475,232.00
Water Well	5	$2,064,740.00

The above infrastructure assets have replacement value estimated at $141,894,208.00.

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 water assets.
- Increased replacement costs.
- Disruption to water 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 a required increased level of service for water 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.

- Drinking water assets are scheduled for replacement after 60 years of service to minimize repairs costs and asset failure. This timeframe can be extended or reduced based on condition assessments.

- Replacements of water assets are completed in conjunction with the replacements of roads, and other underground services.
- Water assets due for replacement will undergo a needs analysis to determine 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 **$91,229,790** or **$ 9,122,979** on average per year. However, the Drinking Waster System Asset Management Policy directs the staff to investigate the following factors before deciding on DWS asset replacements:

- The number of historical water lines breaks
- 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.

Figure 1.6 Forecast Lifecycle Costs

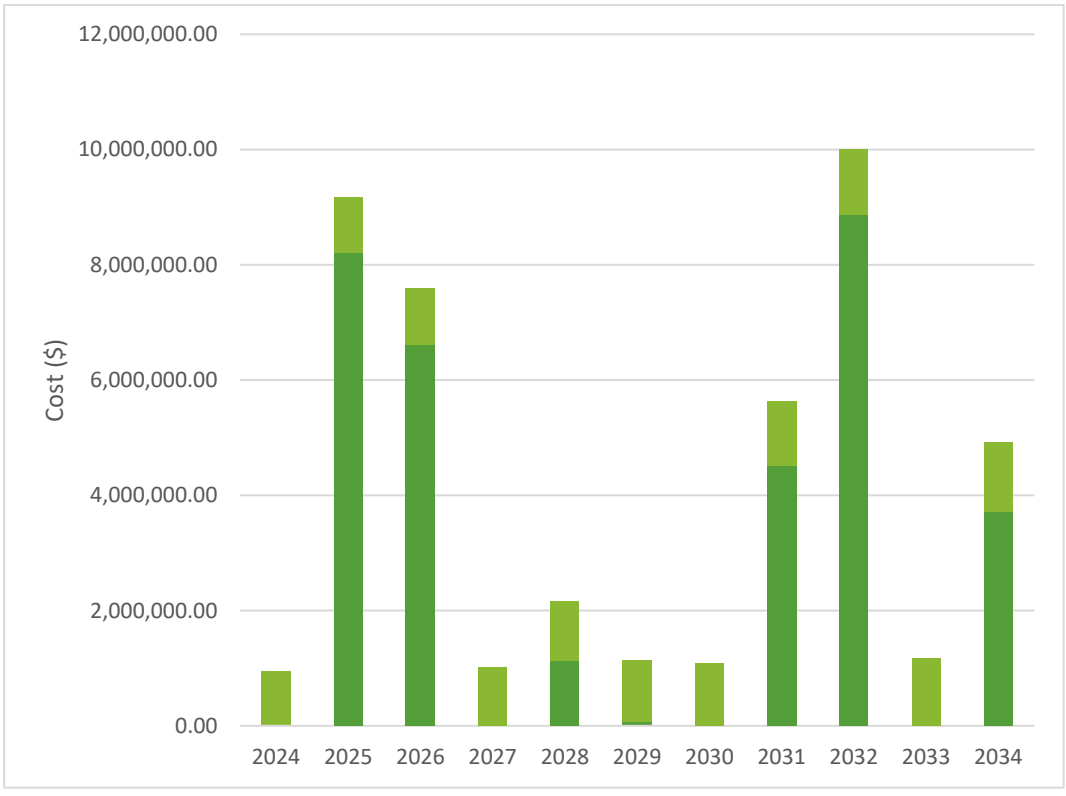


Figure Values are in current dollars.

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

- Maintenance and operation of drinking water assets to ensure clean and safe drinking water is supplied to residents.
- Replacement of drinking water assets before their end of usable life to prevent failure and disruption to the drinking water service
- **The cost of this service is $91,229,790.00 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 drinking water 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 water service capacity due to insufficient raw water supply caused by gaining wells.
- Disruption of drinking water service to residents due to the break of critical supply mains.
- Loss of water 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 water source.
- Rehabilitation of wells as necessary to provide sufficient capacity until the transition to the new water 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 water asset register to include material type and GIS information related to water 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.

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 drinking water system (DWS) assets utilized by the Public Services department. For a detailed summary of the assets covered in this AM Plan refer to Table in Section 5.

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 $142,864,208.

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. ■ 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 DWS 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 new more resilient materials.

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

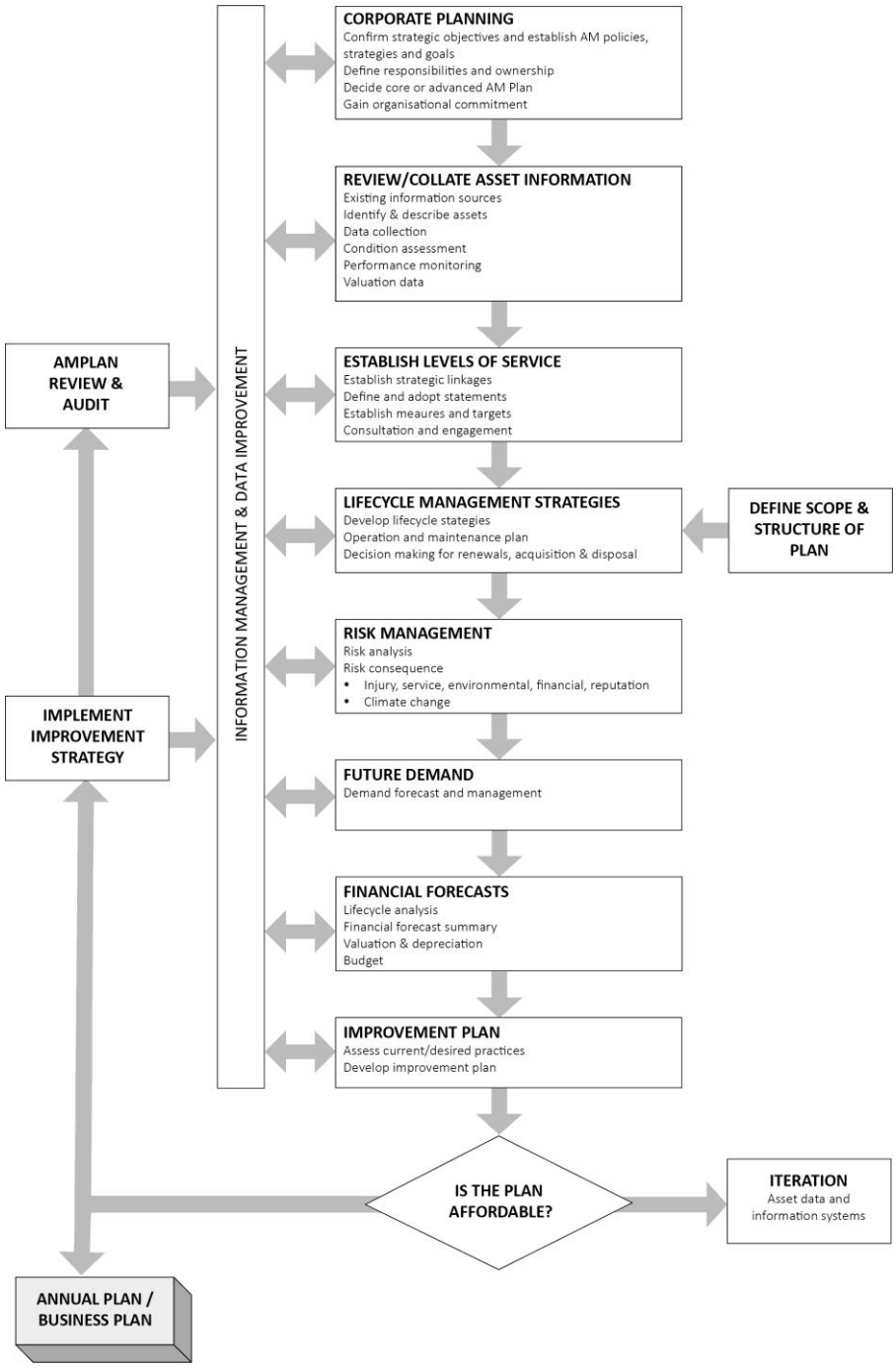
- ISO 55000[1]

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 drinking water asset inventory in terms of 2024 replacement costs. All asset inventories originated from the town's GIS 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 update construction costs from projects which have taken place in 2024.

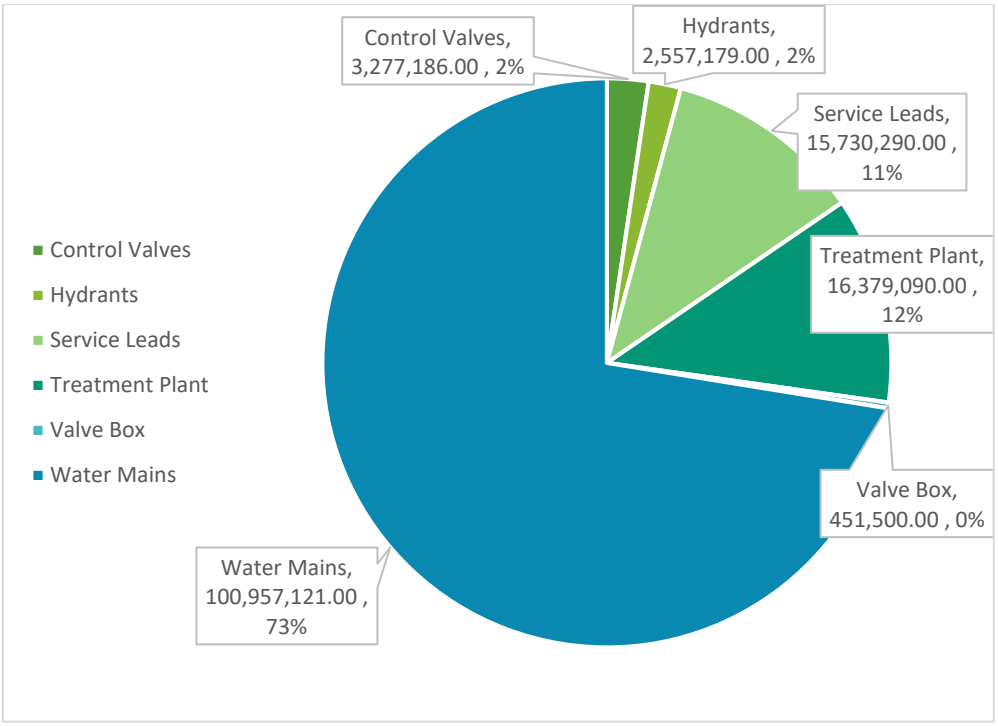
The Town has 4,665 water assets which are maintained by Public Works and PUC which is contracted on behalf of the Town of Blind River. The water assets are broken down into their respective components. This categorization will be used in water system asset management planning and replacement forecasts.

Table 3.2 Drinking Water Assets

Control Valves	1,212 each	$3,277,186
Hydrants	197 each	$2,557,179
Service Leads	8,536 m	$15,730,290
Treatment Plant	1 each	$16,379,090
Valve Box	1,196 each	$451,500
Water Mains	34,131 m	$100,957,121
Water Treatment Equipment	17.00	$475,232.00
Water Well	5	$2,064,740.00

As presented in Table 3.2, watermains are the most valuable assets covered in the Drinking Water System, making up 73% of the total inventory value. There is approximately 34 km of watermains 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 value distribution of drinking water assets.

Figure 3.2 Drinking Water Assets Replacement Cost Distribution



3.2 Asset Capacity and Performance

Different asset classes have different design standards that the Town of Blind River must adhere to. Over time these standards improve – for example minimum water service size is now 25mm and lead is no longer permitted for new installations. Services are replaced to meet these updated standards as part of larger reconstruction projects. There are also areas that will require bleeder systems for water quality. A pressures optimization projects is also planned for the medium-term future.

Currently, the largest issue affecting the drinking water system is the lack of raw water capacity which is provided by the current wells.

3.3 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, water mains are currently replaced when the begin to show signs of failure. A ductile iron watermain has an estimated usable life of approximately 50 years. In the future, we plan to replace water main assets based on the estimated usable life before the asset begins to fail. This approach will allow the municipality to plan the replacement of water assets proactively avoiding costly emergency replacements and repairs.

For drinking water 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, lead services, shallow infrastructure, frozen services, 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 cast iron to ductile iron 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 more than halfway through their useful lives and may be beginning to deteriorate, resulting in large investments required in the coming years to replace or rehabilitate them.

Valves and hydrants follow a very similar installation profile to each other, with increasing investments decade over decade. Water meters currently aren't captured within the plan but this data will be included in future iterations of the plan.

The average age of all water assets is 44 years. The water asset age distribution is shown in Figure 3.3.1.

Figure 3.3.1 Water Asset Age Distribution

3.4 Asset Condition Profile

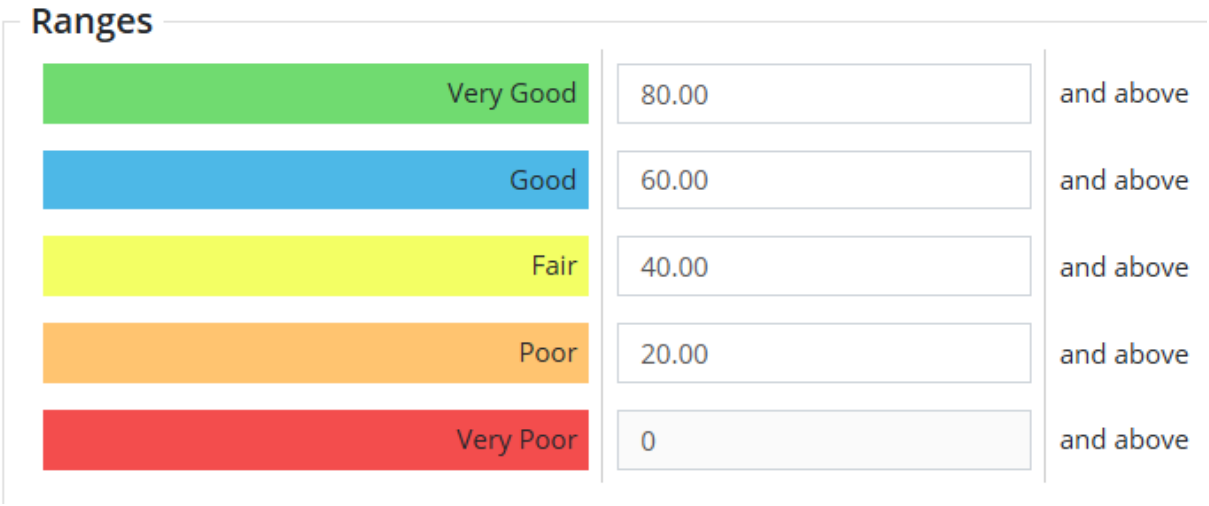
The following figures present the current condition of the Water Utility infrastructure in terms of 2024 replacement costs. Condition was determined for watermains using based on the matieral and age of the watermain. In the future, this condition assessment will be further refined with the development 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. Since hydrants are generally replaced at the same time as watermains, it was assumed that their condition is the same as the mains they are associated with in the asset register.

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.

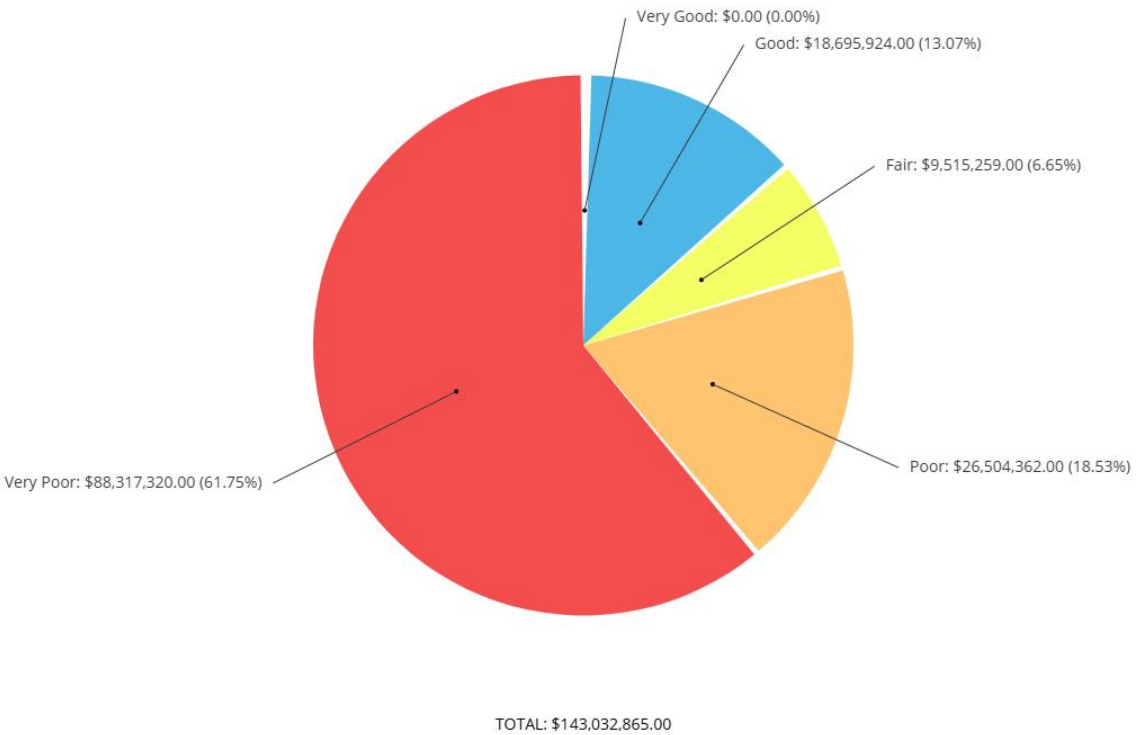
Condition of water assets is determined based on their age and estimated remaining service life. Table 3.4 illustrates the relationship between remaining service life% and condition rating. In 2026, the contractor managing the town's water treatment system will be completing a water system leak analysis which will provide additional quantitative condition data.

Figure 3.4.1 Water Asset Age Distribution



The average condition of DWS assets is 1 out of 5 or very poor. The distribution of water asset condition is shown in Figure 3.4.2.

Figure 3.4.2 Water Asset Age Distribution



As seen in figure 3.4.2 the town's water assets are in poor condition. There has been significant infrastructure reinvestment in the last few years which involved water main replacement. These segments would 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 drinking water AMP.

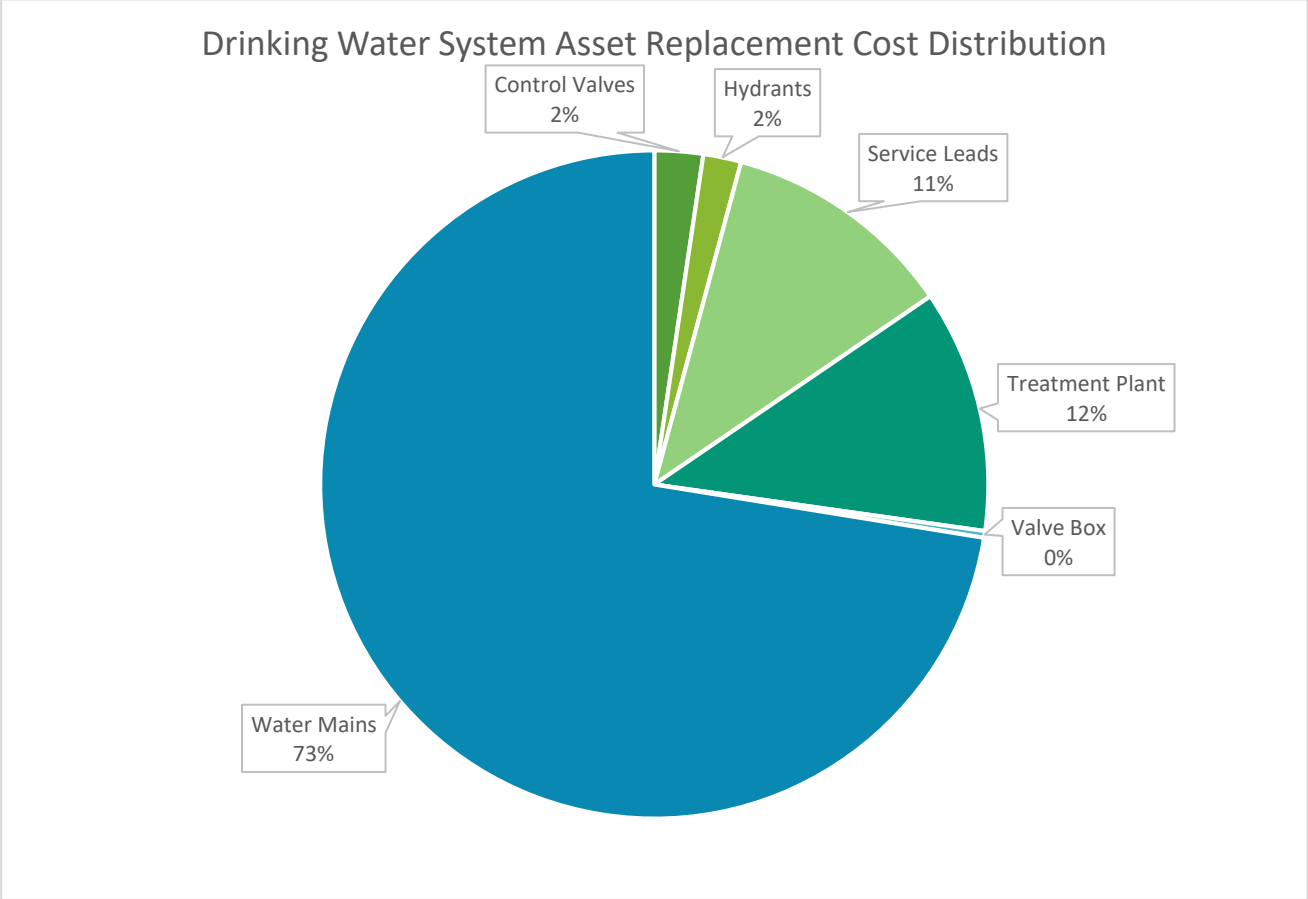
3.5 Forecasted Asset Replacements

The total replacement cost of the DWS assets is **$ 141,892,338.** The forecasted replacement costs during the 10-year planning period of the DWS Asset Management Plan are $ 88,085,481 or $8,808,548 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 $58,094,949. 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. The annual cost over the planned period to service the backlogged asset replacements alone is approximately 5,800,000.

To begin to replace backlogged assets and those forecasted the annual capital budget requirement required would be $9,122,979. These forecasted replacements are displayed in Figure 3.5

Figure 3.5 Fleet Asset Replacement Forecast Distribution by Department



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 DWS services. The customer base for water services is Blind River residents and businesses.

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 ■ Ontario Clean Water Agency
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 drinking water assets	Routine inspection and maintenance of water assets in compliance with all regulatory requirements.
Environmental Sustainability	Lead in promoting and preserving our unique physical environment	Endeavour to maintain an environmentally conscious water operations and promote sustainable water usage.

4.4 Legislative Requirements

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

Table 4.2: 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
Safe Drinking Water Act, 2002 (SDWA)	Sets the framework for ensuring the quality of drinking water, requiring regular testing, licensing of drinking water systems, and operator certifications.
Ontario Water Resources Act	Regulates water resource management, including permits for taking water.
Ontario Regulation 170/03: Drinking Water Systems	• Regular testing for microbiological, chemical, and radiological parameters. • Maintenance of treatment equipment and infrastructure. • Reporting of adverse water quality incidents to the Ministry of the Environment, Conservation and Parks (MECP).
Ontario Regulation 169/03: Ontario Drinking Water Quality Standards	Establishes the maximum acceptable concentration (MAC) limits for contaminants in drinking water.
Ontario Regulation 128/04: Certification of Drinking Water System Operators and Water Quality Analysts	Operators must pass certification exams and participate in ongoing professional development.
Clean Water Act, 2006	• Requires development of Source Protection Plans for watersheds. • Identifies and mitigates threats to water sources (e.g., agricultural runoff, industrial pollution).

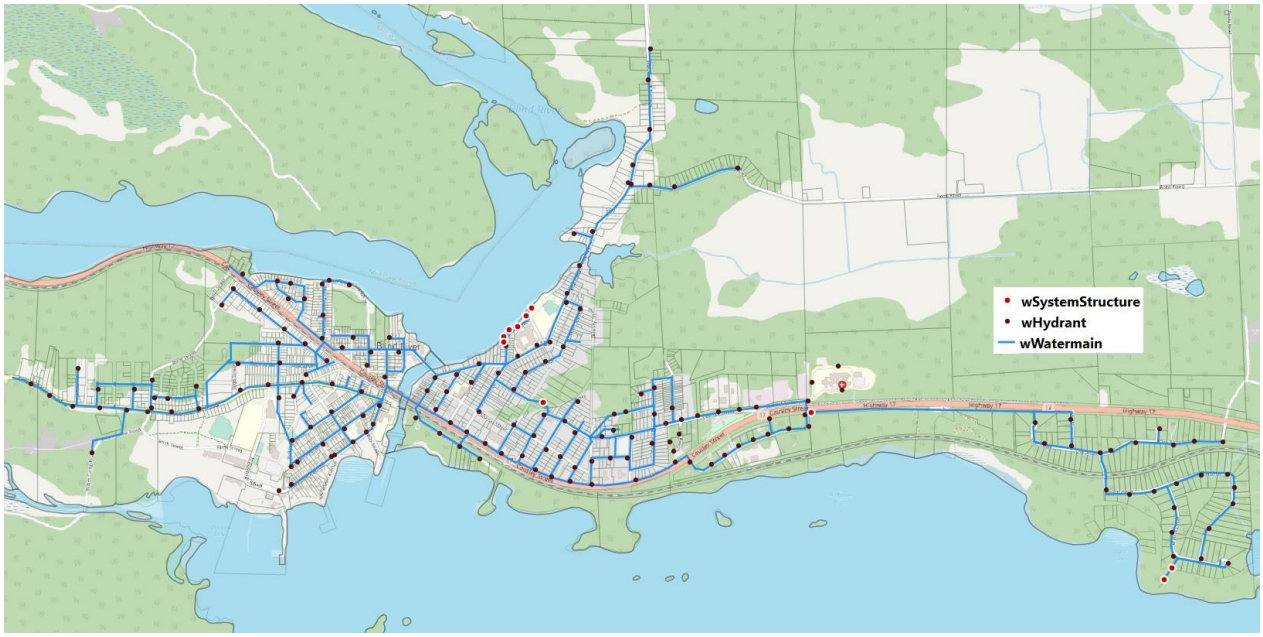
4.5 Community Levels of Service

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 are areas of the municipality that are connected to the municipal water system.	See Figure 4.5
Scope	Description, which may include maps, of the user groups or areas of the municipality that have fire flow	All properties on the water system have fire flow available.
Reliability	Description of boil water advisories and service interruptions	No boil water advisories were required to be issued in 2024.

Table 4.5: Water 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 the DWS are the financial sustainability of operating and maintenance (O&M) costs and renewals in the system. The measures are important from the Town's perspective as it aims to understand the cost of the DWS growth and hence the corresponding increase in operations and maintenance cost.

The renewals in the DWS will help Council and Management to understand the resource capacity DWS assets. Also, for the DWS assets to be in a state of good repair, it is important for the staff to know forecasted replacement levels.

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),

Table 4.7 shows the activities expected to be provided under the current 10 year Planned Budget allocation, and the Forecast activity requirements being recommended in this AM Plan.

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%
	% of properties where fire flow is available	100%
Reliability	# of connection-days per year where a boil water advisory notice is in place compared to the total number of properties connected to the municipal water system.	0
	# of connection-days per year where water is not available due to water main breaks compared to the total number of properties connected to the municipal water system (Reported as total # of main breaks)	2

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 DWS 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 drinking water 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 drinking water 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 drinking water network
Regulatory Changes	The process of addressing changing regulations proactive.	New regulations related to drinking water will be introduced.	The cost of operation and maintenance of drinking water 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. More warm periods through the winter months can result in more frequent and intense freeze/thaw cycles, which can lead to an increase in watermain breaks due to expansion/contraction underground.

Watermains are also more likely to break following colder winters. Relatively cold winters are reflected in the number of breaks that occurred over the winter months, which are much higher than warmer years. Looking to specific months also reveals the influence of temperature on watermain breaks. Recent warmer winters have resulted in a reduction of water main breaks in 2023 and 2024.

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.	■ Unidirectional flushing in Spring and Fall ■ Valve cycling program (1/5 of valves annually) ■ Preventative maintenance ■ Hydrant Flow Testing (every 5 years) ■ Hydrant Flushing and inspection ■ Leak detection survey (TBD) ■ Hydrant inspection in the spring and fall including winterization.	$ 919,375.00
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.	■ Valve replacement ■ Watermain replacement ■ Hydrant Replacement ■ Well rehabilitation	$570,300
Acquisition	Activities related to expand the drinking water services network.	■ New development	$0
Disposal	Activities associated with the decommissioning of segments within the drinking water system.	■ No planned decommissioning events	$0

Non-infrastructure Solutions	Actions or policies that lower costs, extend the life of an asset or identify asset needs.	■ Water break reporting process ■ Future revision of water fee structure to encourage large consumers to reduce their consumption.	$0

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
Water Wells	The water wells have been declining in capacity for years and will soon no longer be able to meet the raw water demands of the system.
GAC Filter	The GAC filter used in the water treatment process to remove organics is longer effective at lower total organic carbon in the water being treated.

The above service deficiencies were identified from the review of water quality and production reports as well as the results of recent well rehabilitation work.

6.3 Operations and Maintenance Plan

Operations include regular activities to provide services. Examples of typical operational activities include cleaning, street sweeping, 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	$ 937,500.00
2021	$ 930,075.00
2022	$ 867,250.00
2023	$ 906,500.00
2024	$ 955,550.00

The 5-year average operating budget for DWS maintenance is $ 919,375.00. Maintenance budget levels are considered to be adequate to meet projected service levels, which may be less than or equal to current service levels.

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.

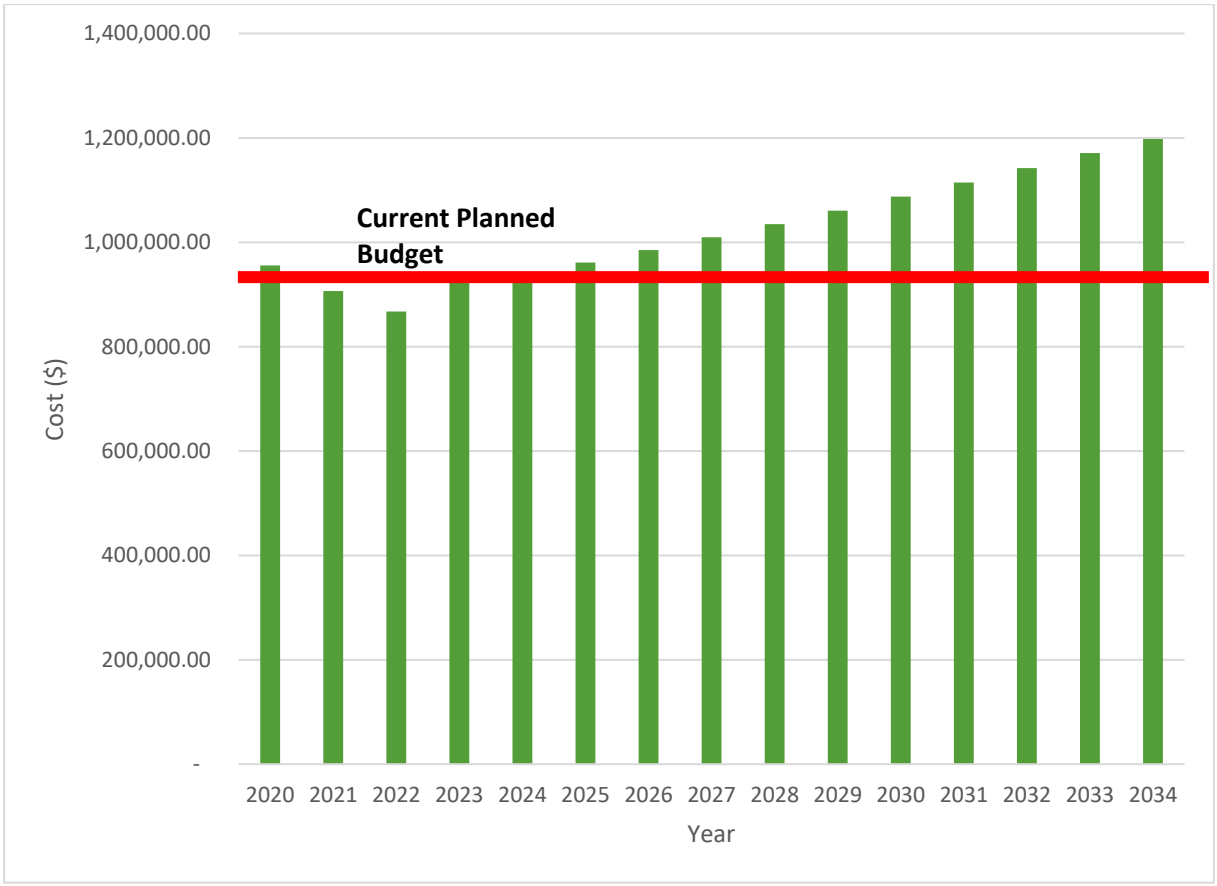
Summary of forecast operations and maintenance costs

Forecast operations and maintenance costs are expected to vary in relation to the total value of the water assets. If additional water 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 an approximate negligible change in maintenance despite increased in costs due to inflation and fuel over the last 5 years. This is in part due to a large portion of water system maintenance 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 so the forecast operation and maintenance costs were based on current inflation rates alone.

Figure 6.2.1 shows the forecast operations and maintenance costs based on proposed operations and maintenance planned budget. The figure shows the total operations and maintenance costs with an increase of 2.5% increase in costs which should be reflective of rising O&M costs, fuel, and costs associated with the expansion of DWS for the next 10 years.

Figure 6.3.1: Operations and Maintenance Summary



[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.

All figure values are shown in current day dollars.

6.4 Maintenance Activities

Maintenance activities are those that maintain the current level of service provided by an asset. These activities ensure that the DWS is reliable and consistently delivers clean, high quality drinking water.

Activities employed under the Public Services Department include a watermain cleaning program, valve operating and various inspections. The watermain cleaning program aids in removing iron and general sediment build up in watermains, naturally occurring in the water supply in Blind River. This sort of work can help limit the number of water quality complaints associated with colour and/or taste. The Town's valve operating program ensures valves are functioning properly, helping to prevent the possibility of prolonged and expanded service interruptions in the event of a watermain break or planned shutdowns.
Other activities include hydrant maintenance and inspections, watermain break response and repairs, and investigations such as those required when a complaint is made regarding water pressure.

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 water infrastructure is planned for replacement in the 10-year capital forecast. Watermain replacements are done as either full reconstruction projects or water only replacement projects.

Full reconstructions include the replacement of water 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 watermains, valves, hydrants and a portion of the costs associated with road reconstruction. In areas where the water infrastructure is in poor condition but sanitary and storm remains in good condition, water 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.

Table 6.4: Useful Lives of Assets

Asset (Sub)Category	Useful life
Hydrants	Same as associated water main
Valves	60 years
Water Mains (Iron or Ductile Iron)	60 years
Watermains (PCV or HDPE)	100 years

The estimates for renewals in this AM Plan were based on the asset register the town maintains in PSD Citywide. The asset register currently lacks material information for watermains and the majority of water main assets in the municipality are iron or ductile iron. To adjust for this replacement forecasts in this plan were calculated based on the assumption that the useful life for all existing water main assets is 60 years.

6.6 Summary of future renewal costs

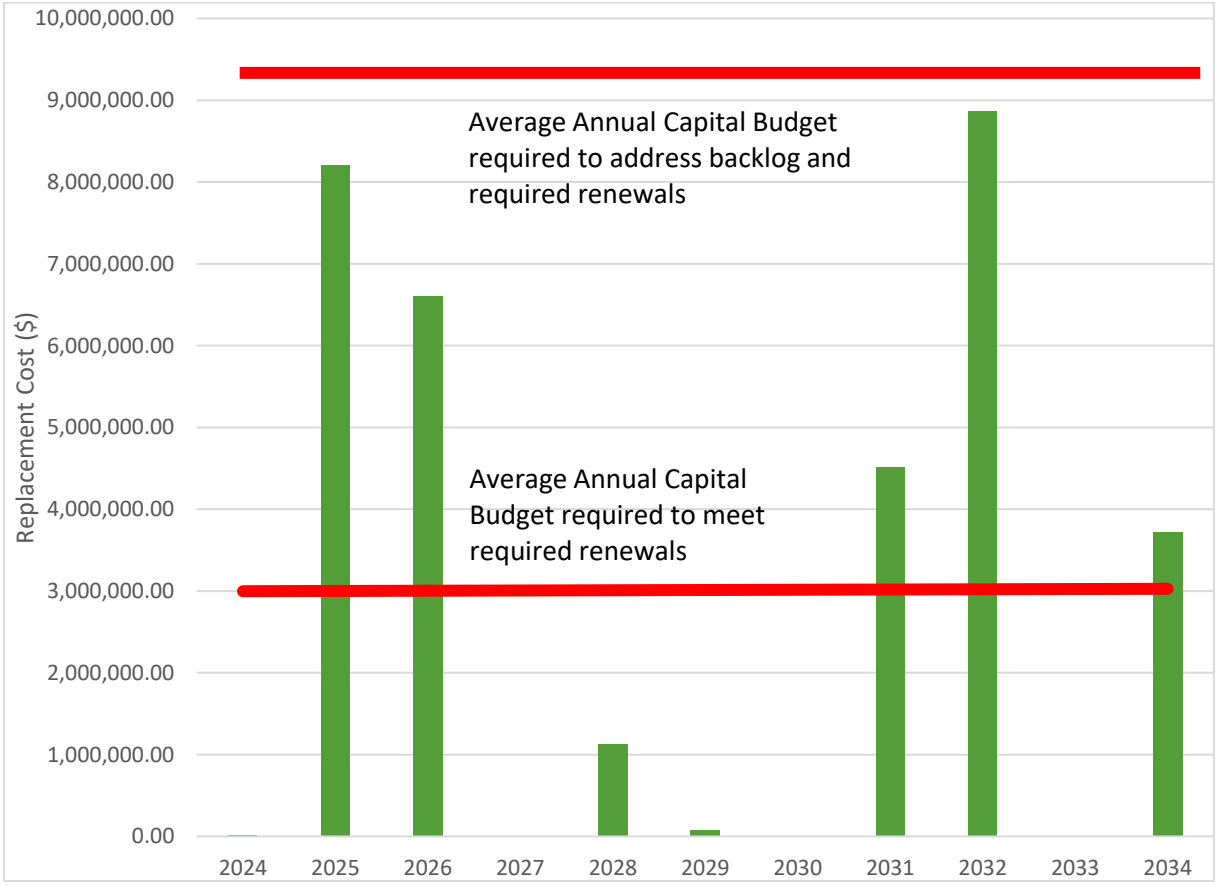
The total replacement cost of the DWS assets is $141,894,208.00. The forecasted replacement costs during the

10-year planning period of the Fleet Asset Management Plan are $33,134,181.00 or 3,134,181 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 $58,094,949. 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. The annual cost over the planned period to service the backlogged asset replacements is approximately 5,800,000.

To begin to replace backlogged assets and those forecasted the annual capital budget requirement required would be $9,122,979. Forecast renewal costs are projected to increase over time if the asset stock increases. The forecast costs associated with renewals are shown relative to the proposed renewal budget 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 2025, 2026 and 2032 being very 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 DWS assets at the current time. In 2026, increased to services may be proposed when the proposed service levels are completed. DWS 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

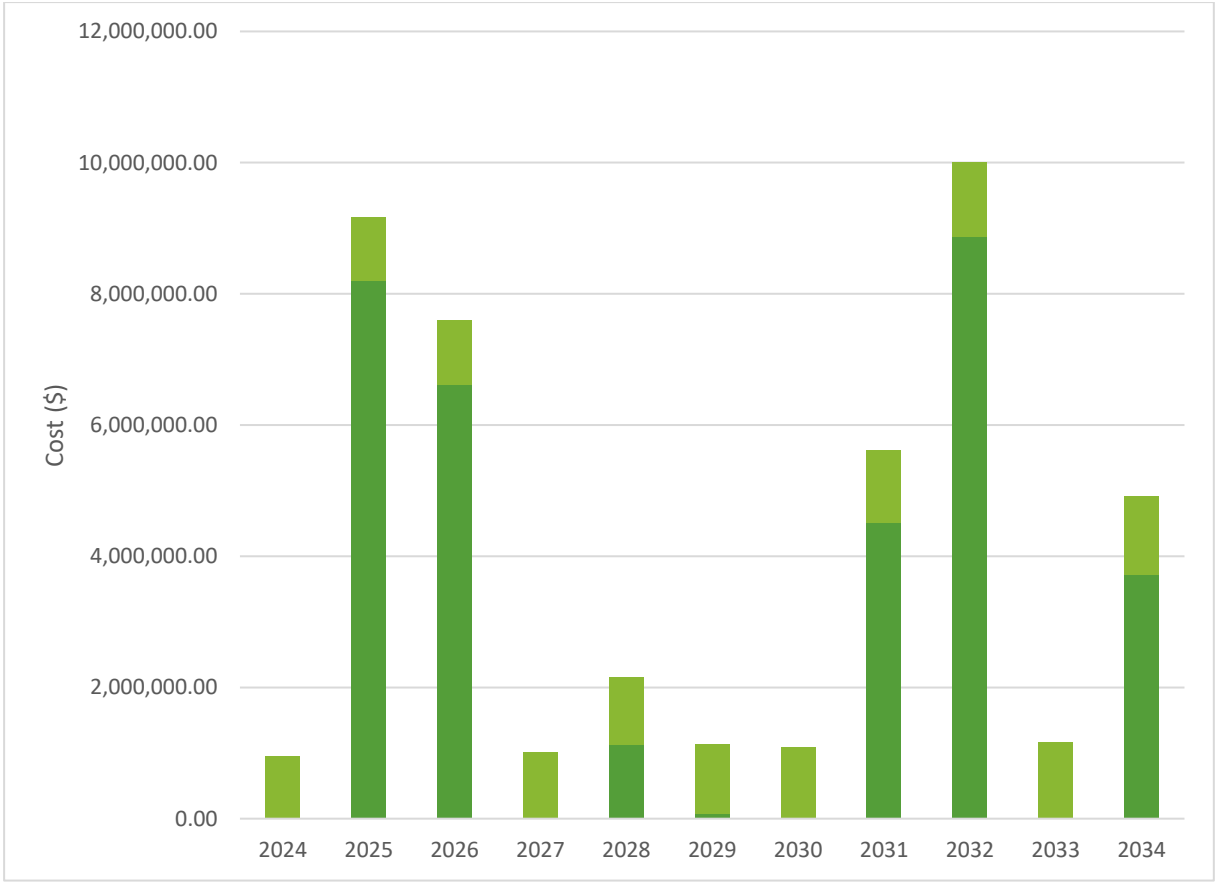
Disposal includes any activity associated with the disposal of a decommissioned asset including sale, demolition or relocation. There are currently no assets identified for possible decommissioning and disposal.

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 proposed budget line indicates the estimate of available funding. 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 $ 9,122,979. The current budget is insufficient to meet the total lifecycle costs of water 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
Water Source - Wells	Well capacity falls too low to provide sufficient raw water to meet treatment requirements.	Usage restrictions placed on the water service. Failure to meet demand.
Treatment Facility	Failure of critical components required for treatment.	Temporary loss of drinking water service.
Critical main break	Main break on sections of main supplying areas without dual supply.	Loss of capability to provide Emergency Services

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.

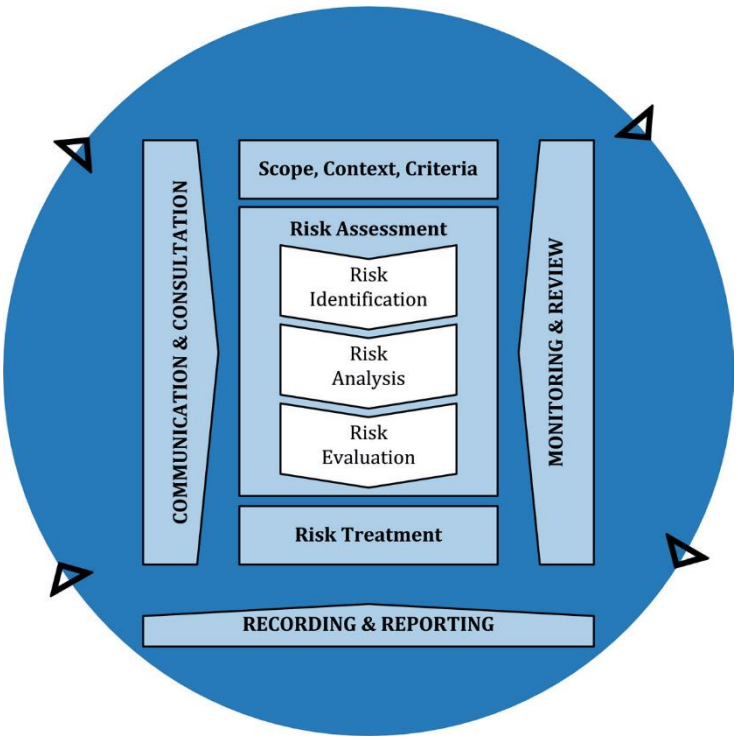


Fig 7.2.1 Risk Management Process – Abridged
Source: ISO 31000:2018, Figure 1, p9

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 DWS assets. Figure 7.2.4 is the risk matrix for the Town.

Table 7.2.2 Probability of Failure Model

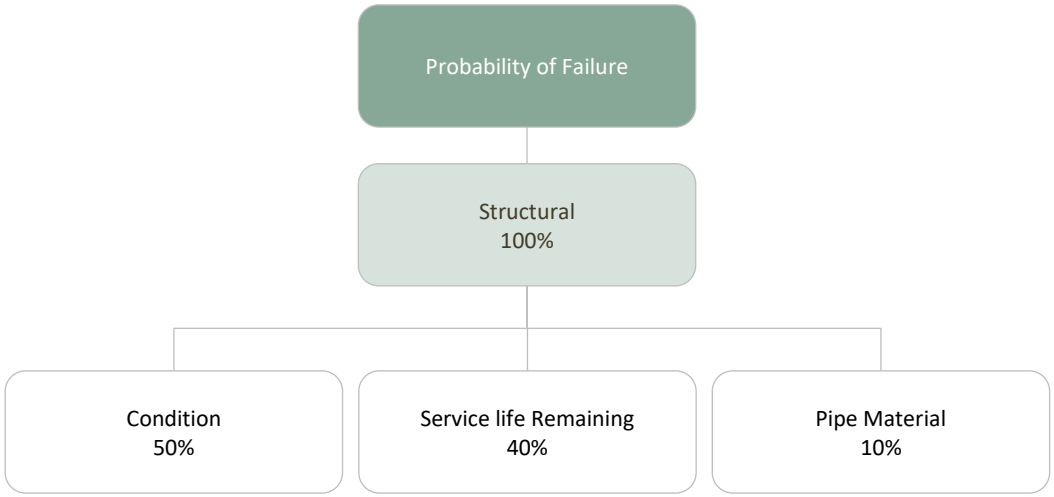
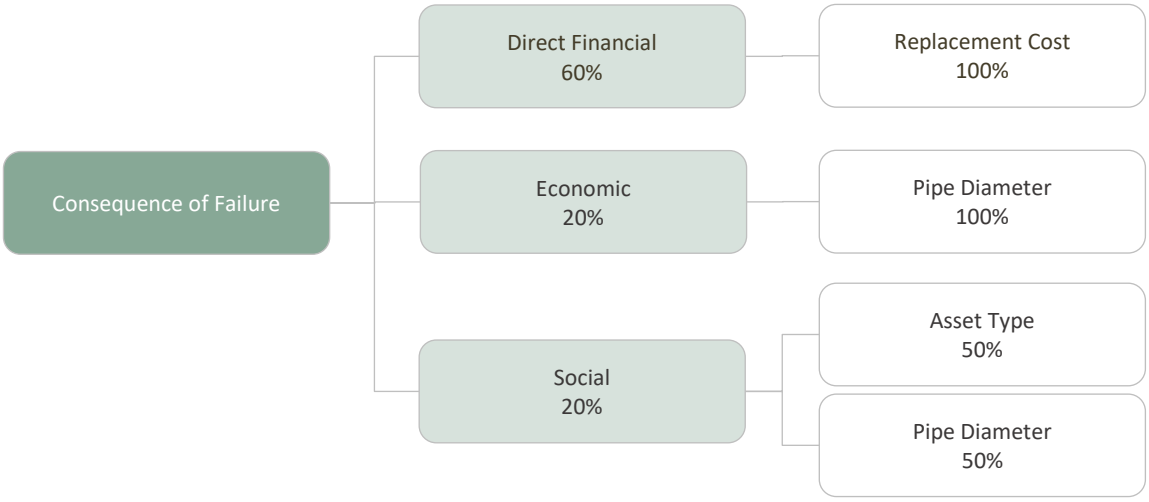
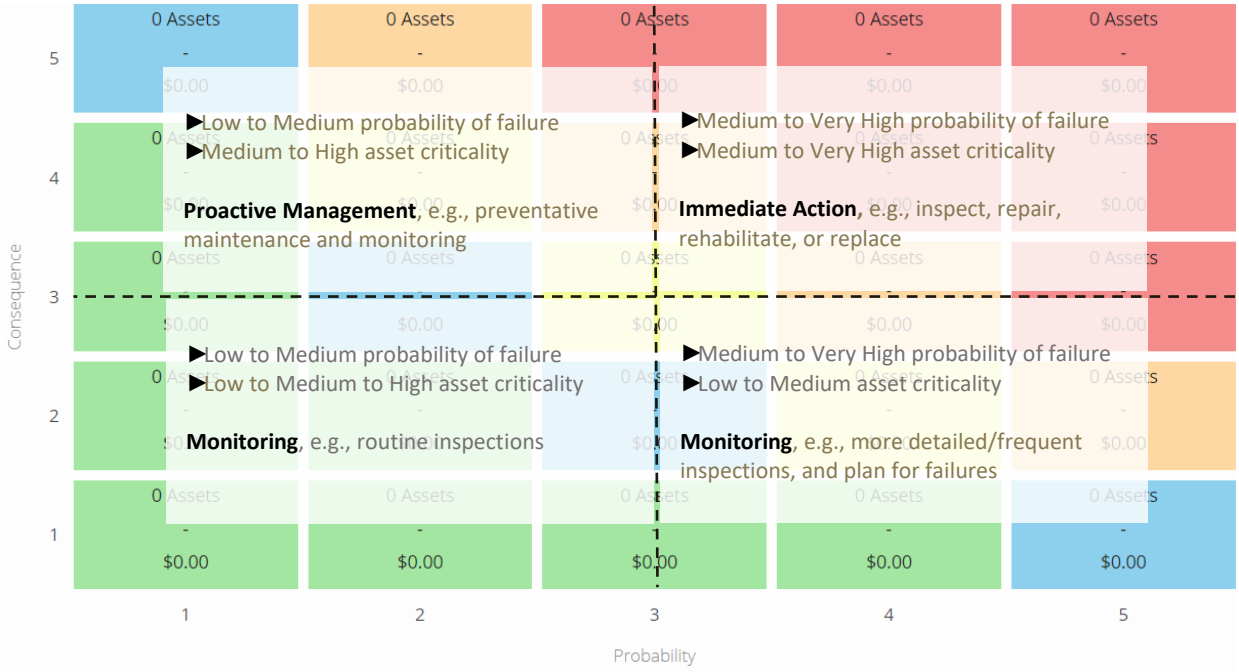


Table 7.2.3 Consequence of Failure Model



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



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 DWS 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 DWS 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
Water main failure resulting in loss of water 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 raw water for treatment	Work is currently underway to utilize Lake Huron as the raw water source for treatment. The design includes two raw water intakes systems so there is redundancy in the event that one fails.

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 water asset and use this factor for replacement prioritization
- Condition data obtained from a leak inspection survey

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	

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

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

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

The source of the data is the town's GIS system as well as 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	The addition of water meters to the asset register.	Director of Public Services	Water asset installation and cost data.	2 months
2	Update material information for all water assets.	Director of Public Services	Replacement of the water asset inventory.	3 months
3	Further expand levels of service beyond what is legislated.	Director of Public Services	N/A	2 months
4	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
5	Assign pipe material to water main segments to further refine condition assessments based on remaining estimated usable life.	Director of Public Services	Update of pipe material	3 months
6	Coordinate water 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
7	Update on field condition of water linear assets.	Director of Public Services	Leak inspection information	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.

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

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.

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.

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