

AGLG

PERSPECTIVES SERIES

December 2020



AUDITOR GENERAL FOR
LOCAL GOVERNMENT

ACCESSIBILITY • INDEPENDENCE • TRANSPARENCY • PERFORMANCE

SUSTAINABLE FINANCING IN

DRINKING WATER MANAGEMENT

Considerations for Local
Government Administrators

RELATING TO AGLG AUDIT TOPIC:

Local Government's Role in Ensuring Clean Drinking Water

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This booklet offers suggestions to all local governments interested in ensuring financial sustainability of their drinking water operations. We recognize that each local government faces unique circumstances, including their size, maturity and capacity as well as the characteristics of their communities. As a result, how each local government chooses to implement these will vary. The success of any strategy presented in this booklet is dependent on the specific circumstances of each local government and its water systems.



THIS BOOKLET

This Perspectives booklet is the last booklet in a four-part series that addresses local governments' role in supplying drinking water.

The first booklet (published in April 2018) focuses on emergency management, including drinking water. The second booklet, aimed at elected officials, provides a high-level overview of drinking water issues. The third booklet, written mainly for local government senior staff and management, is more in-depth, providing some key concepts and operational guidance for integrated drinking water management.

This fourth booklet provides an overview of concepts that local governments should have an awareness of to ensure the long-term financial sustainability of drinking water provision. Some of the strategies presented in this booklet include:

- ▶ Asset management
- ▶ Full-cost recovery, full-cost accounting and full-cost pricing, including rate setting
- ▶ Performance measurement and continual improvement

THE AGLG PERSPECTIVES SERIES

The office of the Auditor General for Local Government (AGLG) carries out performance audits of local government operations in British Columbia and provides local governments with useful information and advice. Our goal is to help local governments fulfil their responsibilities to be accountable to their communities for how well they take care of public assets and achieve value for money in their operations.

The AGLG Perspectives Series booklets are designed to help improve local government performance. These booklets complement our performance audit reports by providing local governments across the province with tools and more detailed information relating to the topics we examine.

Some AGLG Perspectives booklets are written mainly for elected officials, while others are directed more toward local government staff. These booklets are also helpful to others who take an interest in local government in British Columbia.

HOW THE AGLG'S AUDIT WORK CONTRIBUTED TO THIS BOOKLET

The AGLG recently conducted audits on local government drinking water management. From our audit findings and related research, we learned that local governments often face the following challenges:

- Gaps in systemic and proactive processes that provide safe drinking water (including risk assessment and management, and comprehensive maintenance schedules)
- A tendency to do short-term planning and not develop a long-term vision
- Complexities of decision-making in a multi-jurisdictional/multi-scale environment
- Limited knowledge of, and relationships with, neighbouring First Nations
- Incomplete source water protection planning and mitigation
- Limited stakeholder and community engagement and participation
- Lack of integration/collaboration across local government departments
- Ad-hoc conservation and demand management strategies and tools
- Lack of conservation-oriented water pricing
- Gaps in asset management planning and implementation
- Lack of full-cost recovery accounting and barriers to full-cost pricing for the water service
- Limited performance measurement and informal approaches to continual improvement
- Lack of business continuity planning and areas for improvement in emergency management

- Lack of understanding of water system vulnerabilities based on formal risk assessments
- Implications of climate change on drinking water

With the support of subject matter experts, we have developed this Perspectives Series booklet in a format meant to help senior decision makers determine how financially resilient their local government is when it comes to drinking water.

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ASSET MANAGEMENT

INTRODUCTION

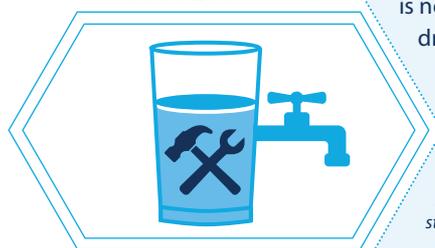


1 WHY SHOULD LOCAL GOVERNMENTS BE CONCERNED ABOUT DRINKING WATER?

Access to safe, reliable drinking water is essential to the well-being of every British Columbian. Many local governments across B.C. are responsible for providing drinking water to their communities.

Local governments who provide drinking water services have a range of risks to manage to ensure they are providing a safe, reliable and sustainable service. These include consideration of public health and safety, drinking water quality, cost control, infrastructure failure, customer satisfaction and others.

DRINKING WATER SYSTEMS



It is estimated that more than \$60 billion is needed to repair or replace drinking water infrastructure that is currently in very poor, poor, or fair condition in Canada.

Source: Federation of Canadian Municipalities, *Canadian Infrastructure Report 2016* pg 12

Ensuring successful delivery and management of community water supplies is complex. It involves multiple aspects, including source protection, adequate and reliable supply, treatment, distribution, planning, monitoring and managing infrastructure systems, with various costs associated with each stage of water provision. Because of the often out-of-sight nature of the service — much of the infrastructure is buried underground — residents and politicians do not always recognize the value or the true cost of providing this service.¹

In addition, many local governments are grappling with historic underinvestment in water infrastructure, compounded by a backlog of maintenance and capital improvement projects, rising systems costs, urbanization, limited resources (finances and/

or staff), changing technology, changing regulations (such as requiring system upgrades) and fee structures that charge less than the full cost of delivering water over the long term.

For some local governments, their drinking water systems cannot be sustained using current levels of funding. It is critical for local governments to understand and plan for the financial requirements of their water systems.

“Canadians pay relatively little for their water, and their consumption is comparably high.”²

The disparity between the price charged and the full cost of providing drinking water has become widely regarded as unsustainable. This disparity may contribute to gaps in infrastructure upkeep and can pose risks to freshwater supplies and drinking water quality. There is growing interest in the concept of “intergenerational inequity,” which may increase when the price charged to deliver water does not fully recover the cost of infrastructure.

Intergenerational inequity related to drinking water refers to the concept of future generations bearing the financial and environmental costs incurred by current water consumers. This can happen through depletion of quantity or quality of water sources or with infrastructure investment decisions that negatively impact future generations.

Intergenerational equity is becoming increasingly important for water service sustainability, leading some provinces to include it in the relevant legislation. The *Public Utilities Act of Nova Scotia*, for example, stipulates that utilities must adhere to the rule of intergenerational equity to cover their capital and operating costs.

Source: Canadian Water Network, *Balancing the Books: Financial sustainability for Canadian water systems*, 2018

¹ Source: Canadian Water Network [CWN]. *Canadian municipal water priorities report: Towards sustainable and resilient water management*, 2015

² Source: <https://www.safewater.org/fact-sheets-1/2017/1/23/water-consumption> 2010 p. 1

In addition, climate change has led to an increase in the frequency and severity of extreme weather events that affect water systems, which may also increase costs.

Changes in climate will vary across the province and may lead to:

- ▶ Hotter drier summer months
- ▶ Warmer winters with increased precipitation
- ▶ Increased frequency and intensity of storms and wind events

Water-related disasters can result in both direct impacts (such as supply shortages from drought, water use restrictions, damage to buildings, infrastructure and crops, and loss of life and property) and indirect impacts (including human health impacts, losses in productivity and livelihoods, increased investment risk and indebtedness).

Each local government will have a different combination of internal and external factors that affect the financing and provision of drinking water, and many seek to approach this in a sustainable manner. There is no singular definition of sustainable financing; however, it generally refers to capital flows, adequately funding operations and maintenance, risk management and financial processes that consider environmental and societal factors, and promoting long-term stability. There are a number of practices aligned with the principles of sustainable financing. Some of these practices include asset management, full-cost accounting, full-cost recovery and performance measurement and management, all of which are explored in this booklet.

SOME FINANCE-RELATED ISSUES LOCAL GOVERNMENTS FACE RELATING TO DRINKING WATER

- ▶ Insufficient data to accurately determine costing
- ▶ Backlogs on the maintenance and capital improvement of systems, which can compound into major, substantive problems if minor problems are left unattended for too long
- ▶ Risk of ageing infrastructure failing, which could create unforeseen, immediate and substantive costs
- ▶ Inadequate pricing, which results in inadequate funding of the system
- ▶ Revenue uncertainty as a result of decreased water consumption due to potentially successful (but poorly planned) conservation efforts
- ▶ Insufficient financial reserves, which mean crisis financing is required to deal with the unexpected
- ▶ Increased system costs, which is common for all services
- ▶ Changing regulations that require systems to undergo upgrades to comply with new licensing requirements
- ▶ Population growth, which creates increased demands on the system
- ▶ Changing climate, such as an increasing incidence of droughts and floods, which affects demands on the system
- ▶ Lack of political will to increase water pricing
- ▶ A lack of understanding of the value of water by the public and elected officials

Source: Canadian Municipal Water Priorities Report, *Towards Sustainable and Resilient Water Management*, 2015

A CONTINUAL IMPROVEMENT CYCLE FOR SUSTAINABLE FINANCING FOR DRINKING WATER

Continual Improvement Cycle

An evaluative loop that utilizes self-assessment, performance measurement and benchmarking to enable decision-makers to identify opportunities to **progressively increase effectiveness**

Performance Measurement

The process of strategically collecting system information in the form of performance indicators to measure the **effectiveness, efficiency and costs** of a system over time to compare with baselines, targets or benchmarks

Asset Management

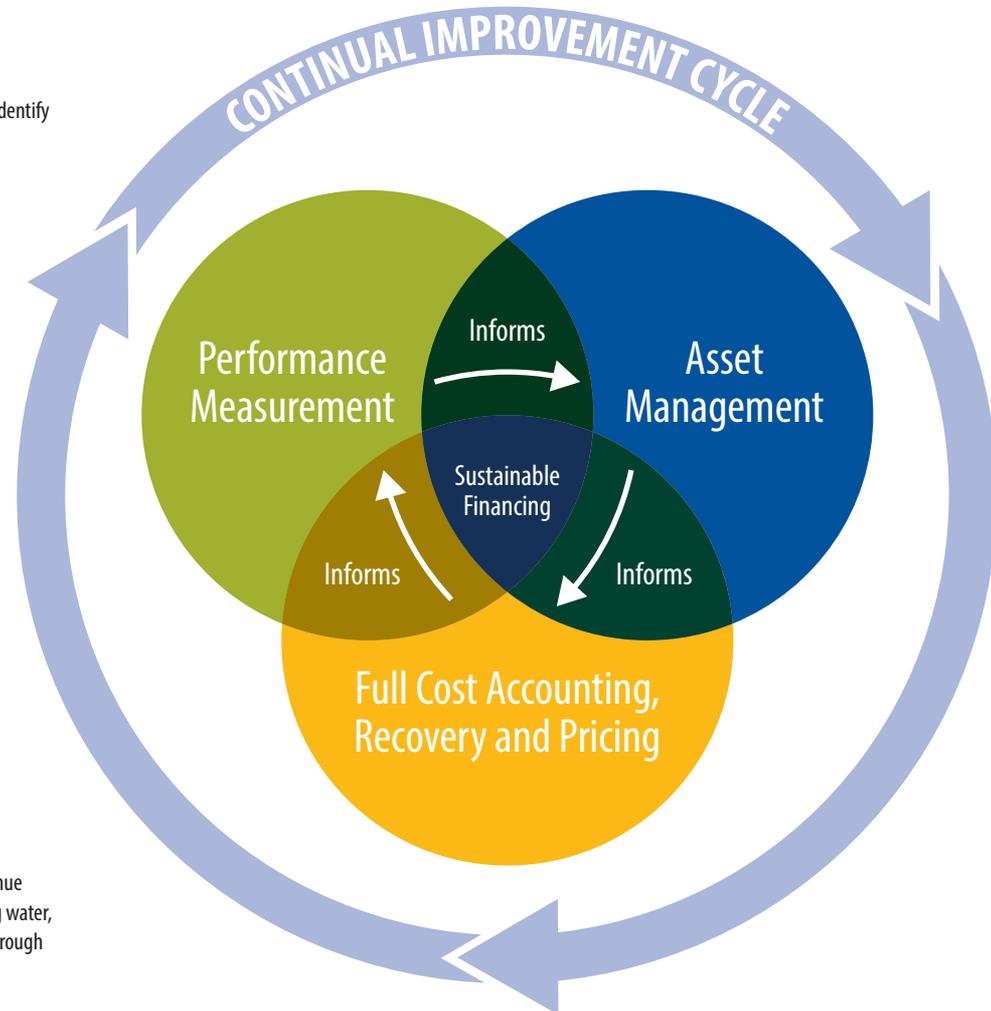
An ongoing process that integrates an inventory of engineered and natural assets with financial information related to the **long-term cost of acquiring, operating and maintaining** these assets in order to understand the investment required to offset depreciation and maintain a given service level of the system

Full Cost Accounting

The process of identifying the full internal and external costs of providing drinking water to customers, leading to a **comprehensive valuation** of the service being delivered

Full Cost Recovery & Pricing

Strategies that ensure the water utility generates sufficient revenue to **cover the full costs** associated with the provision of drinking water, either through rates, grants and taxes (**full cost recovery**) or through rates only (**full cost pricing**)





ASSET MANAGEMENT

WHAT IS ASSET MANAGEMENT AND WHY IS IT IMPORTANT?

Asset management is an ongoing process that integrates an inventory of engineered and natural assets with financial information related to the long-term cost of acquiring, operating and maintaining these assets. It involves analyzing the expected life cycle, capacity, and condition related to service level objectives of each asset to collect information on maintenance requirements, levels of service and replacement needs. For water utilities, this includes identifying the location and assessing the condition and life of assets throughout the water services network. Through this process, local governments can gain an understanding of the current state and ongoing investment required to offset deterioration and depreciation of these assets or to maintain a given level of service for the system.

Local governments can make better informed financial decisions about drinking water provision when they have a solid understanding of their drinking water assets and their condition. Assessing the condition of assets can lead to a better understanding of the full cost of providing drinking water and help enable a full-cost recovery approach for long-term sustainability.

Asset management activities for water systems typically include:

- ▶ A full inventory of assets, including all aspects of the water utility such as wells, dams, intakes, mains, valves, hydrants, meters, reservoirs, buildings, pumps, instrumentation and others
- ▶ An evaluation of all assets for their age, condition, value, material type, main diameter/lengths, replacement cost, deterioration rate, repair history and life expectancy
- ▶ A well-documented assessment of each assets' vulnerabilities and risks
- ▶ A robust preventative maintenance program that optimizes the life of assets

- ▶ Defining levels of service expected from assets over their service life, including the gaps between current and desired levels of service
- ▶ A long-term funding model to maintain a defined level of service
- ▶ A comprehensive reporting system that enables consistent decision-making

Local governments can develop their asset management processes and procedures to align with their organizational capacity and develop a policy, strategy and plan over time.

WHAT DO WE MEAN BY THE CONDITION OF AN ASSET?

Also referred to as “asset condition,” it is a measure of the physical health of an asset. The condition is an indicator of how well the asset can perform its function, and a predictor of when it will need to be repaired, renewed or replaced before it needs to be repaired, renewed or replaced.

There are several factors that can affect an asset's condition, including:

- ▶ age
- ▶ material used
- ▶ environmental exposure
- ▶ maintenance history
- ▶ how well it's treated by the community
- ▶ how much use it gets

Note: It can be difficult to obtain condition assessments for some buried assets such as mains and service lines - modeling and proxy based condition projections can be helpful in these cases.

What is an asset management policy?

An asset management policy is a council- or board-endorsed commitment to asset management. This foundational document generally lays out a local government's approach to asset management and includes systematic and coordinated direction and guidance for staff undertaking asset management across the organization.

What is an asset management strategy?

An asset management strategy summarizes a local government's asset management plan and long term financial plan to provide an overall corporate view of long-term financial requirements.

What is an asset management plan?

An asset management plan lays out the asset management activities, which inform the local government's long-term financial plan and asset management strategy. These plans are routinely updated to become more accurate over time.

What is an asset management program?

An asset management program is the ongoing process a local government uses to identify asset needs such as maintaining, rehabilitating, replacing and financing assets. Data collected in an asset management program can inform public engagement activities related to explaining water investments needed to maintain the level of service.

WHAT ARE LEVELS OF SERVICE OR SERVICE LEVELS?

'Levels of service' refers to the value received by the community from the asset. How a service level is defined depends on the type of asset being considered.

Setting service levels involves measuring what the community is receiving relative to its needs and expectations, while analyzing how well a local government is able to deliver those services through its assets.

Source: Adapted from: The Canadian Network of Asset Managers, *Asset Management 101: The what, why, and how for your community, 2018*



THE CORE ELEMENTS

Asset Management BC provides a foundational list of questions managers can use to assess their asset management practices.

1. What assets do you own and where are they?
2. What is the depreciated value of your assets?
3. What are the conditions and expected remaining life of your assets?
4. What service and asset risks need to be prioritized and managed?
5. What is the current and desired or targeted level of service?
6. When will repair, upgrade or replacement be required?
7. How much will it cost?
8. Which assets can or should be retired?
9. Which new assets may be required and when?

Source: AMBC, *Asset Management for Sustainable Service Delivery: A BC Framework*, 2019

Asset Management BC has developed a framework that includes essential stages for B.C. communities to move toward sustainable service delivery. The graphic shown here is the basis for the framework. The framework is a living document and has recently been expanded to include primers on climate change, integrating natural assets, operations and maintenance and land use planning.



WHAT SHOULD BE INCLUDED IN AN ASSET MANAGEMENT PROGRAM FOR A DRINKING WATER UTILITY?

To make good decisions, water utilities need accurate information about their assets and how the community is likely to change and develop. Utilities should also collect information on how a changing climate may affect their assets over time. As mentioned, a local government's asset management program should include a comprehensive inventory of assets, including engineered and natural assets.

Engineered Assets

Linear Assets

Local governments' asset management programs for their water utilities should include linear assets such as valves, mains and any other infrastructure that carries water to users.

Vertical Assets

An asset management program should also include vertical assets such as reservoirs, dams, wells, tanks, treatment plants, facilities, pumping stations and other above ground assets.

Other assets included in the asset management program include hardware, equipment, information technology assets and other tangible capital assets.

Natural Assets

An emerging best practice is the inclusion of natural assets (land and natural ecosystems³) in an eco-asset strategy. Damage to land or an ecosystem may add significant costs to the provision of quality drinking water, though very few jurisdictions have calculated this cost.⁴ Conversely, natural assets that are protected can appreciate in value in some cases, if they are restored. It should be noted, however, that Public Sector Accounting Board (PSAB) standards do not permit inclusion of natural assets as tangible capital assets on audited financial statements (except when there are historic costs).

ECO-ASSETS STRATEGY

There is growing interest in an innovative approach that applies principles from asset management, financial planning and ecological management to the operations and maintenance of infrastructure. This eco-asset strategy may provide local governments with a greater understanding of the value provided by ecosystems and improve the financial and operational management of a community's assets.

The Town of Gibsons is one the first Canadian municipalities to explore managing its natural capital, using infrastructure and financial management concepts that are systematically applied to managing engineered assets. Their rationale is that the natural services provided by these systems, in the form of rainwater management, flood control and water purification, have tangible value to the community.

The strategy focuses on identifying existing natural assets such as green space, forests, topsoil, aquifers and creeks that provide municipal services such as stormwater management, measuring the value of these services and making this information operational by integrating it into municipal asset management.

Other municipalities may benefit from mapping out their natural assets and the services they provide and determining whether these assets can be restored or managed differently to provide vital municipal services.

Source: Town of Gibsons, *Towards an Eco-Assets Strategy in the Town of Gibsons, 2015*

³ Note: Natural ecosystems include rivers, lakes, ponds, forests, aquifers and wetlands which are involved in the storage and filtration of drinking water.

⁴ Source: Canada's Ecofiscal Commission, *Only the Pipes Should be Hidden: Best practices for pricing and improving municipal water and wastewater services, 2017*

Asset Management and Climate Change

Implementing an asset management program can support a local government's preparation for becoming more climate change resilient. Climate change may pose a range of different risks to a local government's installed assets. Understanding the capacity of installed assets can help local governments prepare for and mitigate the impacts of climate change.⁵

Climate change may impact local governments' drinking water systems:

- Drought may mean water sources become less reliable
- Source water quality may decrease
- Increased water demands may lead to system capacity issues
- Infrastructure may be damaged by fire or floods
- Water quality may be impacted by flooding
- Reservoirs may be damaged
- Water treatment requirements may change due to changes in water quality (e.g. algal blooms)
- Local governments may need to increase water use restrictions

Detailed information on installed assets will improve decision-making related to addressing risks posed by climate change. Developing an understanding of the local risks to drinking water can support water utilities to propose the most appropriate asset management decisions.

⁵ Note: For more information see *Asset Management BC's Climate Change and Asset Management: A sustainable service delivery primer, 2018*
AGLG Perspectives Series booklet 2020/21



WHAT ASSET MANAGEMENT TOOLS ARE AVAILABLE FOR LOCAL GOVERNMENTS?

There are a number of tools available to assist with developing and implementing an asset management program for water utilities and organizations. Many local governments already have some software tools in place to monitor and manage their drinking water systems. The data that is collected in these systems, once analyzed, can serve as a starting point for an asset management program.

Data collection

Information that can be integrated into an asset management program can include data from Geographic Information Systems (GIS), Supervisory Control and Data Acquisition (SCADA) systems, automated sensors, existing asset registers and other systems. Water utility asset data can also be combined with data from other local government services, such as roads, bridges, wastewater, transit systems and others. An asset management program that considers the broader inventory of assets for a local government will enable better identification of priorities, co-ordination of works and more accurate projected costs for these services.

Geographic Information Systems

A Geographic Information System (GIS) can be a valuable tool for a water utility's asset management program. It can graphically display the location and attributes of hydrants, valves, mains and other key equipment and can include information such as potential flow from hydrants, main sizes and other data. Additional information can be added to the GIS datasets such as maintenance history, age of asset, current condition, pipe material and other important information. GIS can output data about installed assets into tables, and support reporting and query functions for your local government. A GIS system produces data which can be used to support decision-making.

Specialized asset management software

Also available are various specialized software tools which can help a local government consider asset life cycles, develop long-term financial plans, model the condition of assets and assist with other functions.



HOW DO I IMPLEMENT AN ASSET MANAGEMENT PROGRAM?

Implementation of an asset management program is an ongoing process that involves people from multiple departments. Implementation happens in stages and can involve diverse teams which may include planners, engineers, financial analysts, operators, accountants, communications staff and elected officials. A cross-departmental, multi-disciplinary approach can lead to better, more informed decision making by council.

The implementation of an asset management program does not require drastic changes to organizational structure, but does require ongoing, high-level leadership and engagement to ensure its continued success.

Planning for asset management

The foundational step for your local government as it begins to develop an asset management program is to develop an asset management policy which will help guide staff to deliver the organization's strategies, plans and program.

Building an inventory of assets

An inventory of assets can be built gradually, starting with data that is already being collected, and updating the inventory over time. Identifying the location and condition of buried assets is central to the development of an asset management plan.

There are multiple benefits to being able to properly account for critical infrastructure including better operations and maintenance planning, faster emergency response times and reduced risks when excavating.

Bringing together data sources from multiple asset categories can help identify opportunities to effectively budget for and co-ordinate the maintenance and/or replacement activities for multiple assets. For example, co-ordinating data on the condition of roads and underground utilities could allow a local government to save cost by prioritizing repairs and/or upgrades in areas where multiple repairs/upgrades can be done at once. It is important to keep asset inventories up-to-date to reflect changes in the condition and life expectancy of assets.

Developing a comprehensive maintenance program

A well-planned maintenance program will help keep equipment operating reliably and efficiently throughout its life cycle. Unplanned and/or emergency repairs on a system will usually cost more than planned maintenance activities. Developing a schedule of required maintenance can help prevent costly delays resulting from defective equipment. Well-maintained systems minimize disruptions and failures, last longer and are more reliable.

Most water supply infrastructure needs to be rehabilitated during its life time because the expected service life of parts differs, for example pumps, filters and other small or mechanical parts is five to 15 years, where properly installed and maintained pipes and water tanks are expected to last 50 to 100 years.

For more information about asset management for local governments, see the AGLG Perspectives Series booklet "Asset Management for Local Governments - Key Considerations for Local Government Council, Board Members and Staff to Help You Manage Your Infrastructure Assets."



**FULL-COST
ACCOUNTING,
RECOVERY
AND PRICING**

FULL-COST ACCOUNTING, RECOVERY AND PRICING

A full-cost approach to the financial management of your water utility includes identifying all the costs incurred to provide drinking water to customers, including:

- Operations and maintenance
- Administration
- Overhead
- Reserves
- Costs of compliance with regulations
- Debt servicing
- Capital
- Environmental costs

Once full costs have been identified, your local government can implement full-cost recovery and pricing, which involves generating sufficient revenue through user rates and taxes to cover the full utility costs. Grants can also provide revenue however, they are not a predictable source.

Full-cost recovery and full-cost pricing are strategies used to ensure that the utility has the resources to financially sustain the drinking water system, maintain and operate the system over the long term, and replace ageing assets as needed. Full-cost pricing also includes current users paying an appropriate share in order to not pass cost on to future generations.

Another increasingly important aspect of sustainable financing is contingency planning for times when normal revenue sources are interrupted and normal operations are not possible. Contingency planning may take the form of specific financial reserves, mutual aid agreements or other approaches.

PRINCIPLES FOR MOVING TOWARDS FINANCIALLY SUSTAINABLE DRINKING-WATER AND WASTEWATER SYSTEMS

Principle #1: Ongoing public engagement and transparency can build support for, and confidence in, financial plans and the system(s) to which they relate.

Principle #2: An integrated approach to planning among water, wastewater and storm water systems is desirable given the inherent relationship among these services.

Principle #3: Revenues collected for the provision of water and wastewater services should ultimately be used to meet the needs of those services.

Principle #4: Life-cycle planning with mid-course corrections is preferable to planning over the short-term, or not planning at all.

Principle #5: An asset management plan is a key input to the development of a financial plan.

Principle #6: A sustainable level of revenue allows for reliable service that meets or exceeds environmental protection standards, while providing sufficient resources for future rehabilitation and replacement needs.

Principle #7: Ensuring users pay for the services they are provided leads to equitable outcomes and can improve conservation. In general, metering and the use of rates can help ensure users pay for services received.

Principle #8: Financial Plans are “living” documents that require continuous improvement. Comparing the accuracy of financial projections with actual results can lead to improved planning in the future.

Principle #9: Financial plans benefit from the close collaboration of various groups, including engineers, accountants, auditors, utility staff and council.

Source: Watson & Associates Economists Ltd., *Towards Full Cost Recovery: Best practices in cost recovery for municipal water and wastewater services*, 2012



WHAT IS FULL-COST ACCOUNTING?

Full-cost accounting (FCA) is a process that records all the costs incurred to provide drinking water to customers. This process involves a thorough analysis of internal and external costs, and may consider economic, environmental, health and social factors. This process leads to a comprehensive valuation of the service being delivered.

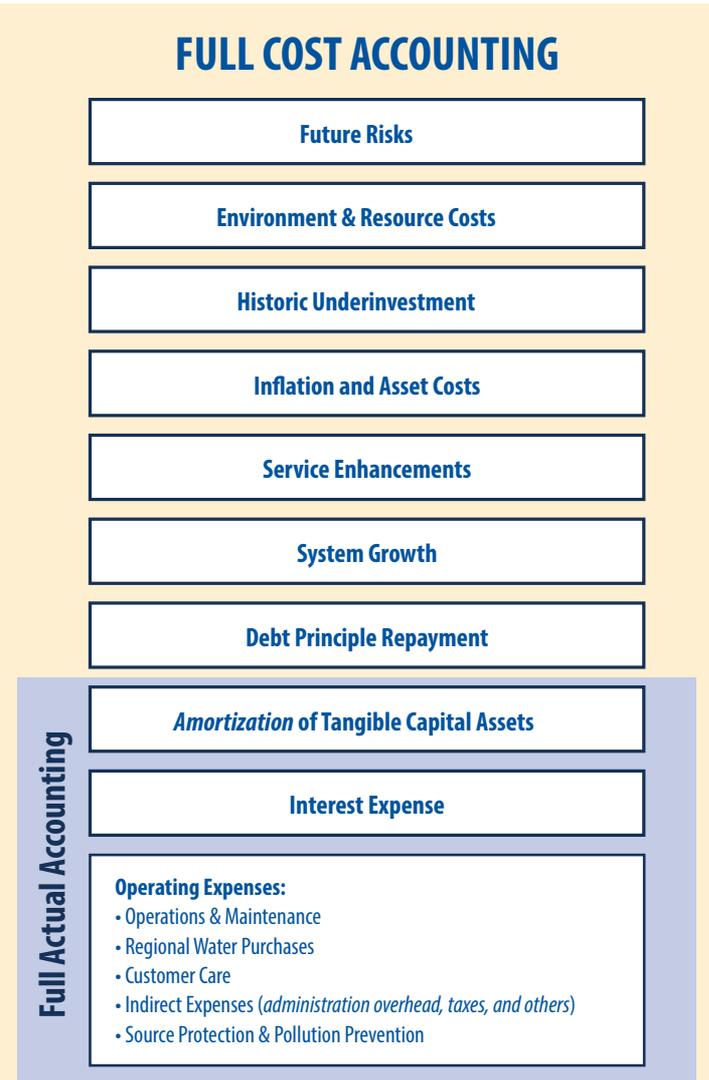
Before a plan to sustainably finance the utility can be made, all the costs associated with the utility must be identified. This includes costs identified by full accrual accounting, requirements for system growth, inflation, debt principle repayments, service enhancements and other relevant factors, such as the environment. Environmental factors may include defining currently unpriced environmental and resource costs such as depletion of water sources and land use impacts.

Implementing full-cost accounting can be beneficial to a local government not only because it helps ensure a water utility is adequately financed over the long term but also because it will:

- ▶ Provide knowledge of the urgency and priority of investments to the system
- ▶ Help to better identify the full range of costs of drinking water, including costs related to risks
- ▶ Help management evaluate and define rate requirements

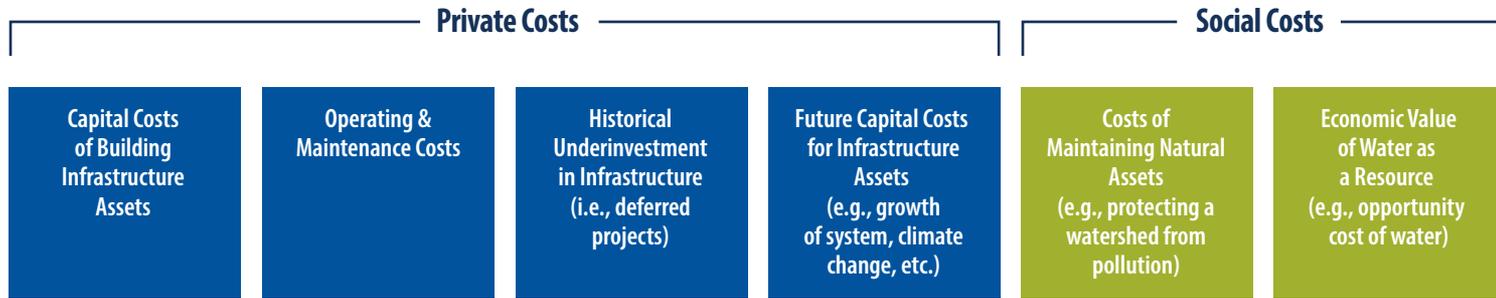
Full-cost accounting is a leading approach for fully identifying the cost of delivering a service. To implement full-cost accounting, data from the asset management system can help define the current state and ongoing investment required to maintain a given level of service and the investment required to offset the depreciation of your drinking water assets. Operations and other cost data can be collected from your accounting system. Identifying costs associated with growth and environmental impacts will take additional analysis and may involve co-ordination with other departments.

FULL COST ACCOUNTING

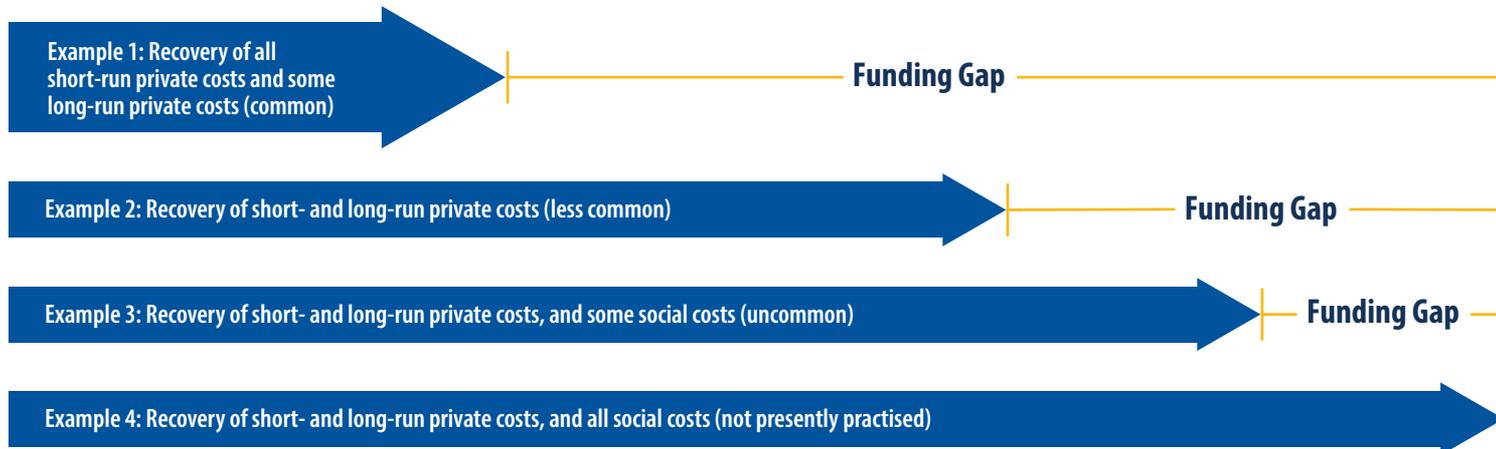


Source: Adapted from: Canadian Water Network, *Balancing the Books: Financial sustainability for Canadian water systems*, 2018

SPECTRUM OF COSTS FOR MUNICIPAL WATER AND WASTEWATER SYSTEMS



Extent to Which Municipalities Recover Private and Social Costs



Note: Private costs are costs borne by the water utility, and social costs are costs borne by society. The economic value of water as a resource means that as water supplies become scarcer less is available for other uses (such as watering lawns, or supporting ecosystems).

Source: Canada's Ecofiscal Commission, *Only the Pipes Should be Hidden: Best practices for pricing and improving municipal water and wastewater services*, 2017



WHAT IS FULL-COST RECOVERY AND WHY IS IT IMPORTANT?

Full-cost recovery (FCR) is a practice that generates sufficient revenue to recover the full costs associated with the provision of drinking water service through user rates, grants, taxes and other means. Across Canada, water utility infrastructure is ageing and maintenance and replacement costs are increasing for many local governments. An FCR strategy includes planning for sufficient increases in service rates to cover maintenance, renewal and growth. In some jurisdictions, such as the Province of Ontario and the Halifax Regional Water Commission, full-cost recovery for water utilities is legislated.

Ontario's *Sustainable Water and Sewage Systems Act* defines full costs as,

"source protection costs, operating costs, financing costs, renewal and replacement costs and improvement costs associated with extracting, treating or distributing water to the public and such other costs which may be specified by regulation" and requires utilities to report these costs.

British Columbia does not currently mandate utilities to report full costs.

Source: Watson & Associates Economists Ltd., *Towards Full Cost Recovery: Best practices in cost recovery for municipal water and wastewater services, 2012*

Implementing an effective FCR approach will result in a local government acquiring sufficient funding to ensure the long-term sustainability of the water service at the desired levels of service. There are a number of additional potential benefits a water utility may experience as a result of using an FCR approach:

- Provides a technically defensible financing plan where the local government can demonstrate accountability to its customers
- Facilitates rate stability by reducing the risk of sudden large increases or decreases in water rates

- Improves knowledge of the urgency of investments and allows budget components to be effectively prioritized and financed
- Provides additional data for benchmarking and may enable more accurate comparisons between local governments
- Can be used to promote water efficiency (user rates incentivize conservation)
- Provides more information to elected officials to explain budgets and rate requests by tying them to long-term financial plans and levels of service
- Supports adequate investment in areas such as maintenance and asset management, which factor into: compliance with regulations, and reducing public health risks, emergency repairs and exposure to liabilities

Additionally, local governments may face the following risks by not implementing an FCR approach:

- Inadequate investment in areas such as maintenance and managing assets, which may result in non-compliance with regulations, increased public health risks, emergency repairs and exposure to liabilities
- A widening gap between the full costs and current expenditures may lead to larger than anticipated rate increases, additional borrowing or required subsidization from other sources

Some barriers a local government may experience when moving to a full cost recovery approach include:

- Limited system information and asset management planning, which would make identification of full costs more difficult
- Historic underinvestment in infrastructure, resulting in the requirement of substantial investment over time to meet current and future needs
- Public concern about or resistance to rate changes and tax increases

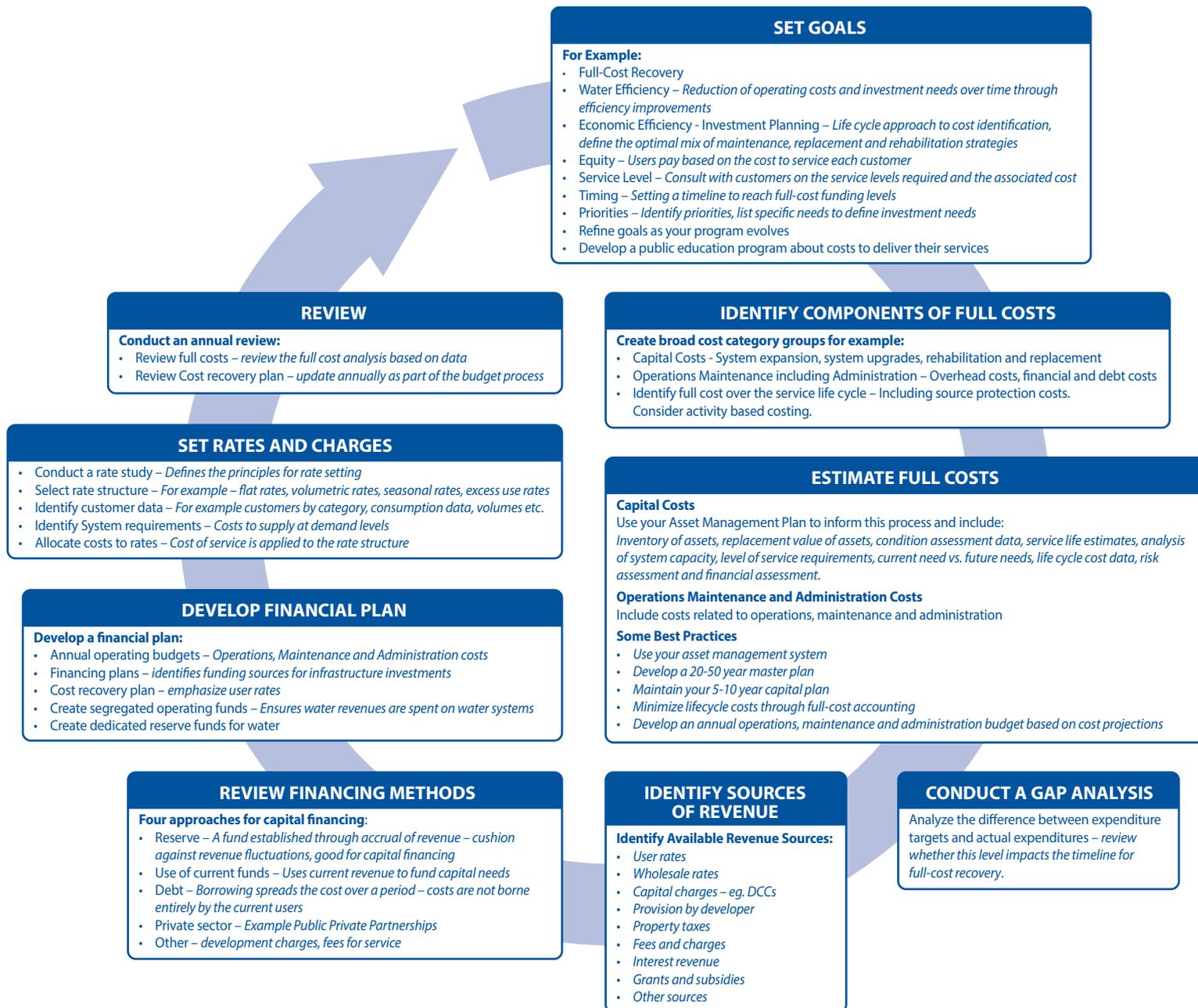
To overcome these challenges, communication with the public, elected officials and other stakeholders about the steps required to achieve full cost recovery will help remove some of these barriers.

Implementing full-cost recovery requires a stepped approach with different levels of planning. One example of an approach that can be used as a guide has been developed by the Federation of Canadian Municipalities. It has identified nine steps to establish a full-cost recovery plan for water and sewer rates.

There are a number of good practices that can help local governments achieve full-cost recovery such as:

- Installing water meters for all types of users and shifting to a user-pay approach
- Identifying gaps between expenditure targets and actual expenditures and developing a full-cost recovery strategy to address the gap

- Creating a multi-rate structure to provide stable revenues while also encouraging conservation
- Using an asset management plan to provide information related to capital, operations and maintenance costs over the service life cycle
- Considering the costs borne by society – for example, natural asset protection costs
- Looking at all sources of revenue, including user fees, development fees, fire-protection charges, property taxes and government grants
- Setting performance targets or benchmarks to clarify expectations and inform prioritization of resources
- Reviewing rates annually and adjusting in a transparent and predictable way
- Funding capital costs related to system expansion using development fees. These fees can be project-specific capital works charges paid by a developer. A more broadly applied charge can apply for larger works that have potential to require wider system improvements.



Graphic developed from content from Federation of Canadian Municipalities and National Research Council, *Water and Sewer Rates: Full Cost Recovery*, 2006



WHAT IS FULL-COST PRICING AND HOW DOES IT DIFFER FROM FULL-COST RECOVERY?

Full-cost pricing (FCP) delivers full-cost recovery with the use of user rates and charges only, with no reliance on grants from other levels of government or funding from the local government's general revenues.

The goal of FCP is to cover the entire cost of running the water system with revenue from user fees.

The use of full-cost pricing presents several benefits to local governments, such as:

- Ensuring there will be sufficient funds available to sustain the provision of drinking water without relying on revenue sources from outside the utility such as grants or property tax revenue, thereby enabling local governments to use available grant funding on other projects
- Creating a direct link between the cost to the consumer and the cost to the local government so water users gain an understanding of the costs associated with providing drinking water and may be encouraged to reduce some of these costs by changing their consumption behaviours
- Encouraging water conservation by creating incentives for those involved in land use and infrastructure planning to develop "water smart" practices and technologies

As with asset management and full-cost recovery, implementation of full-cost pricing requires an ongoing public engagement process that provides detailed pricing and cost information to water users. Water users that have information about the true cost to deliver drinking water are more likely to understand and accept the need to change water rates.

IMPLEMENTATION OF FULL-COST PRICING

It is good practice to implement full-cost pricing over time, incorporating several factors into decision-making. Some of the steps include:

- Evaluating all the costs associated with the utility and incorporating adequate accounting programs
- Evaluating and optimizing all aspects of the system (including treatment, operations, metering, billing, distribution, debt instruments and more)
- Monitoring and documenting usage patterns for various sectors of users
- Educating consumers on the value the utility provides
- Implementing an asset management plan
- Determining the actual cost of service
- Planning for reserves necessary to fund the maintenance and upgrades required
- Planning for the future and forecasting revenue requirements
- Implementing reporting procedures

Source: North Carolina Department of Environmental Quality, *Full-Cost Water Pricing*, January 2013



WHAT ARE SOME OPTIONS FOR SETTING WATER RATES?

There are a number of different approaches to pricing drinking water that a local government can consider when setting rates. Currently, local governments in BC employ a range of different pricing structures. Many water users in B.C. are billed a flat fee for their water service, irrespective of their actual consumption. A minority of British Columbia water utilities have water meters installed for all customers and charge volumetric rates.

For utilities with water meters

Water meters enable numerous pricing options that can help utilities achieve sustainable financing and full-cost recovery. These pricing options can be used to achieve the utilities goals. Some of these options are included here as examples:

Single-block rates: charge the same unit rate for all consumption, providing a simple calculation that may be suitable for small water systems.

Decreasing-block rates: charge progressively less per unit of water as consumption increases. This rate structure may contribute to economic development in areas where industry places demand on water resources, however, this structure does little to promote conservation.

Increasing-block rates: charge increasing rates per unit of water as consumption increases. While this encourages conservation, it may lead to adverse outcomes if particular industries are heavily reliant on water, or if overall consumption decreases to the point of affecting revenues.

Humpback rates: provide a “best of both worlds” structure, as block rates initially increase for particularly heavy residential and commercial users, but the cost of the highest tier decreases to accommodate heavy industrial water users.

Excess use rate: A rate that uses tiers based on typical usage for an average customer class and an increased rate for consumption beyond the typical usage volume.

Seasonal rates: Seasonal rates enable local governments to charge different rates in different seasons to promote conservation, or to accommodate increased demand.

WATER METERING

Universal metering provides an equitable basis for charging users based on their individual consumption and is a tool that is central to comprehensive water pricing programs. A water service provider that does not have universal metering often charges based on flat rate pricing. Flat rate pricing does not encourage water conservation because water users pay the same rate regardless of their consumption. Metering also enables better analysis of where system leakage is occurring. Residential water metering is not currently used by all local governments in British Columbia.

Benefits of Metering

- Creates equitable rates for customers based on usage
- Reduces water waste through better leak detection
- Promotes efficiency and conservation
- Enables better measurement of system use
- Enables full cost recovery pricing
- Improves customer knowledge of water use and costs

Sources: Brandes et al., (2010), *Worth Every Penny: A primer on conservation-oriented water pricing*, POLIS project, University of Victoria and Watson & Associates Economists Ltd., *Towards Full Cost Recovery for Municipal Water and Wastewater Services: A guide for municipal councils*, 2012

Having a purely volumetric charge to users does not provide a stable source of revenue, as usage can fluctuate depending on variables such as the time of year or the rates being charged. Some stability can be achieved using a two-part rate comprised of both a fixed charge and a consumption charge.

Fixed Charge: The fixed charge is normally referred to as a base or minimum charge and is designed to recover a portion of fixed costs from customers on a per-bill basis. These fixed charges are designed to recover fixed cost components that are independent of costs directly related to either the production or the delivery of water.

Rate structure without universal metering

For water utilities that do not have universal metering for their customers, a billing model that classifies users based on their consumption can be helpful. For example, rate classes could include: single-family residential (inside city/ outside city), multifamily residential (condo/apartment/ townhouse), commercial (differences within commercial), industrial (large/small), irrigation, wholesale, fire protection (public/private) and others based on conditions.

WHY IS IT IMPORTANT TO BUILD AWARENESS ABOUT DRINKING WATER SYSTEM COSTS?

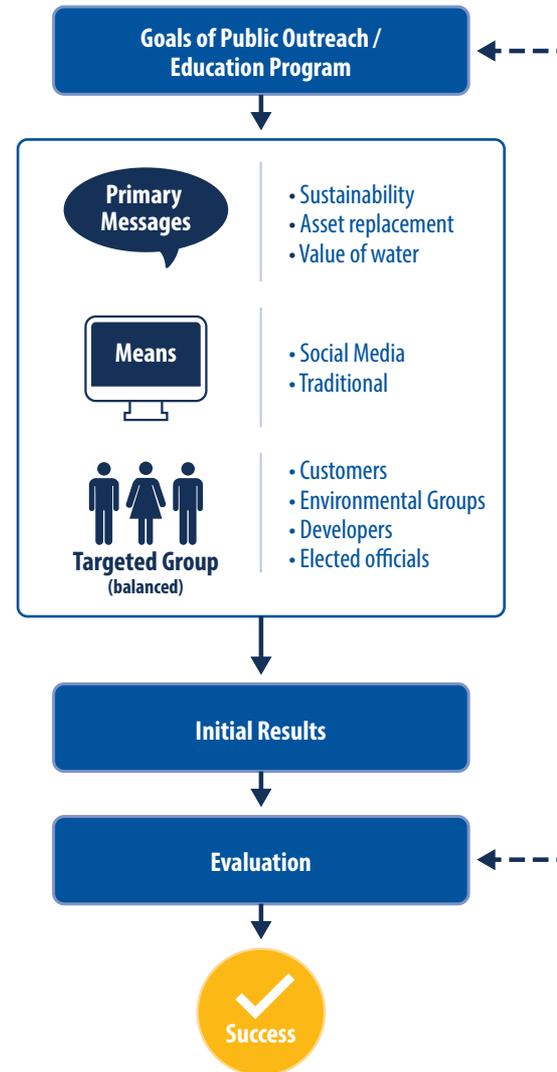
Open and transparent communication with the public about the water system and its finances can build public confidence and support for the water system and its financial plans. Public awareness about the full cost of delivering clean drinking water can be enhanced by local governments by providing information related to:

- utility operations
- regulatory requirements
- capital requirements
- asset condition
- service level costs
- other elements that are part of the full cost of the water system (e.g., source water considerations)
- full-cost recovery/pricing activities
- the role that water utilities play in protecting public health and the environment

It is important to communicate the cost of the service related to reliably delivering safe drinking water and to identify what this cost includes.

Outreach focused on a local government’s drinking water service can result in increased public support of the utility, including support for rates and rate increases.

COMMUNICATION PLAN



Source: Raftelis, G. A., (2015), *Water and Wastewater Finance: The changing landscape*, 4th ed., CRC Press



WHAT ARE SOME EFFECTIVE COMMUNICATION TOOLS FOR LOCAL GOVERNMENTS CONSIDERING A TRANSITION TO FULL-COST RECOVERY?

Good communication can support sustainable decisions and improve outcomes. Communication provides opportunities to build public support, gain input and insight that may not have been considered and reduces barriers to change by proactively identifying concerns and risks.

If possible, involve the public and other stakeholders early in the decision-making process to transition to full-cost recovery. Public outreach and stakeholder engagement activities held before a council vote on moving to a new system involves the public in making the decision, builds public trust, identifies risks and areas of concern and collects key statistics to include in future communication activities.

Stakeholder Engagement and Public Outreach Planning

A stakeholder engagement and public outreach plan is a good starting point and can provide guidance for both ongoing and targeted campaigns. The plan should include several major elements, such as primary messages, intended recipients, guidance related to methods and measures for success. Operationally, the plan should identify the timing of messages and assigned responsibilities.

“Engaging with the public via meetings and consultation processes is absolutely crucial to any successful communications initiative, be it an official community plan, wastewater treatment facility, curbside recycling program or the development of a new pool, arena or industrial facility. People still want to connect face-to-face – never forget that.”

Source: Northern Development Initiative Trust, *Small Town P.R. Playbook*, December 2016

TWO COMMON PUBLIC EDUCATION STRATEGIES INCLUDE:

Ongoing long-term messaging: Information that may be useful to share over the long term includes materials that educate the public on the water utility's performance, its ongoing operations and repeated, high-intensity seasonal messaging.

Targeted campaigns: Specialized information tied to specific initiatives, such as significant changes or capital projects. For example, a targeted campaign could be used to publicize a rate study or specialized research during the lead-up to an event such as a change to fees or start of a capital project.

Source: Raftelis, G. A., (2015), *Water and Wastewater Finance: The changing landscape*, 4th ed., CRC Press

Tips for effective communication

- Know your audiences – Consider what stakeholder groups may already know and what they may need more information on. Ask yourself what their biggest concerns may be and try to anticipate ways you can address those concerns
- Use language that is simple and easy to understand - avoid technical and financial terminology
- Answer the basics first – Who? What? When? Where? Why? How?
- Define your key messages
- Design your messaging for your identified audience
- Provide communication materials in multiple languages based on community needs
- Set communication goals, which may include public education, motivation or co-ordination towards a common goal
- Make strategic use of different communication methods, including mail-outs, online surveys, web content, social media, public information sessions and others

- Evaluate communication outcomes and incorporate learnings into your next campaign
- Consider hosting a town hall using a community engagement software platform and tools
- Consider facility tours to raise awareness about operations and costs

A stakeholder committee is a committee that is established to assist a local government in supporting management-led external and internal communications. A stakeholder committee is made up of selected stakeholders, established with a terms of reference, and can be an effective method of public outreach. Stakeholder committees can be established as a permanent body or as a project-specific temporary body.

When developing and working with a stakeholder committee, be prepared to provide oversight, listen and act.

1. Carefully consider the scope of the input requested from the committee to ensure that committee outputs meet your needs.
2. Strive for balance and diversity. A group with different opinions allows the utility to hear a greater range of ideas on a subject. The recommendations of a diverse group will carry greater weight than those of a homogeneous group.
3. Create opportunities for meaningful input. A structured group process is important, such as providing contextual information to the group, setting an agenda and taking minutes.
4. Acknowledge the committee's contributions by communicating back, where appropriate, on the actions taken from their suggestions.

Water Advisory/Rates Advisory Committee

Some utilities have established a water advisory committee or rates advisory committee to assist with communication and engagement related to studies for water rates. A water advisory committee often includes a cross-section of the population and representatives from different customer groups such as developers, industrial customers, various residential customers and others. Water advisory committees may assist in consultation for: water quality, source water protection, distribution, rates, infrastructure and capital improvements, and communication with the community. The committee is involved throughout the rate study and assists in prioritizing pricing objectives and reviewing different scenarios. By proposing an approach or solution that is endorsed by a broad group of community stakeholders, committees can support elected officials who make difficult and often contentious decisions when approving rate changes (especially increases).

Using Data for Communication and Evaluating Engagement Effectiveness

Data from performance measurement systems can be incorporated into public communication materials and contribute to raising awareness about the operation of the water utility relative to the desired level of service. There are a range of ways to represent data that can be understood by members of the community that do not have technical knowledge of water systems or other financial terminology, but who will still be asked to provide input on and support local government initiatives.

People are more likely to engage when provided with concise and clear content. Simple language is accessible, efficient and creates fewer misunderstandings. It improves the citizen's experience and starts the conversation off on the right foot.

Think about how a subject would be explained to a Grade 6 class. A local government should be able to give an overview of its water systems and the importance of full-cost recovery without using jargon, and it should be concise enough that you could format it into a one-page letter or brochure for its residents. Remember: a person with no background in the subject area should be able to understand why a change is being made.

Other approaches to consider include:

- Creating an infographic hand-out to share with residents in-person or through your website
- Writing a frequently asked questions guide
- Creating a “Did you know?” campaign on your social media platforms regarding drinking water management in your community
- Hosting opportunities for residents to ask staff in-person about the project
- Creating a new page on your website dedicated to the system
- Proactively engaging with local news outlets to explain the project and its benefits

In order to evaluate the effectiveness and reach of public engagement programs, it is important to collect data about how the program went. Designing programs with a measurement system in mind means including which quantitative and qualitative data will be collected. For example, some possible metrics include: the number of people reached by the campaign, the level or magnitude of a behavioral shift, the amount of feedback received and customer satisfaction levels.

EXAMPLE OF STAKEHOLDER ENGAGEMENT PLANNING CONSIDERATIONS

STAKEHOLDER	LIKELY OPINION ABOUT THE RATE INCREASES	RELATED CONCERNS/ INTERESTS ABOUT RATE INCREASES	MESSAGES/INFORMATION RELATED TO RATE INCREASES	RECOMMENDED MEDIUM
Major ratepayers	Likely negative	Effect on household budget or bottom line	Total bill per ratepayer	Letters with billing information (include staff contact information); group meeting(s)
Commercial and industrial customers	Generally negative	Amount of the rate increase; effect on cost of business	Total bills (for large ratepayers)	Letters with billing information (include staff contact information); group meeting(s)
Developers	Indifferent	—	—	—
Elected officials	Varies	Effect on constituents; case for increase	Succinct talking points, history of and information about rates	Face-to-face meetings
Engineers/designers	Indifferent	None in particular	N/A	—
Environmental groups	Positive	Plan for spending the money	Program summary (activities and actions); relationship between rate increase and measureable changes in service	Face-to-face meetings
Fixed and low income owners	Negative	Relief programs	Billing information; relief available if any	Community meetings; newspaper article; billing insert
Homeowners	Varies	Effect on household or budget	Billing information; where the money is going	Web FAQ; newspaper article; billing insert; public meetings
Landlords	Indifferent or negative	Lead time, ability to pass on increases to tenants via leases	Total bills (for landlords with many properties)	Letters with billing information (include staff contact information); group meeting or meetings
Media outlets	Varies	Communicating about the increase; what are the details, what is the news angle?	Answers to frequently asked questions	Calls to reporters; press releases; a backgrounder in plain language (along with a news release); interviews
Tax-exempt and government	Varies	Effects on budget	Affordability	Same as major property owners

Source: Raftelis, G. A., (2015), *Water and Wastewater Finance: The changing landscape*, 4th ed., CRC Press

PUBLIC ATTITUDES ON CANADIAN WATER SYSTEM INFRASTRUCTURE

A 2014 Royal Bank of Canada Water Attitudes Survey found that the majority of Canadians have very little understanding of where their water comes from or how it is treated, what happens to their waste or their community's water infrastructure challenges.

Only 1 in 10 Canadians thought that water treatment, water delivery and stormwater systems in their community required major investment.

A 2015 study on public attitudes about water infrastructure identified that in order for elected councils and boards to make water infrastructure a priority, they need to know they will have the support of the public. If the community is not aware of the threats to their water systems or the inevitable costs of doing nothing, they cannot be expected to support the decisions that need to be made, which may include:

- Investing in water infrastructure over other projects
- Disrupting communities to implement improvements
- Raising water prices

A panel of water experts determined that building public support requires communication and education, and proposes that a communications plan should be built on three main goals:

1. Raise public awareness and encourage commitment to the state of water infrastructure.
2. Promote the need and benefits of infrastructure improvement and replacement to target audiences.
3. Maintain consistent and positive messages at all times.

Source: Canadian Water and Wastewater Association, *Public Attitudes Project 2015: Changing public attitudes on the value of Canada's water system infrastructure, 2015*

TWO EXAMPLES OF COMMUNICATING RESULTS TO THE PUBLIC

The City of Nanaimo uses a balanced scorecard process to measure its performance. Although measures in such scorecards usually align with an organizational strategy, the City's measures were drawn from various plans after strategic planning had taken place. The City of Nanaimo currently lists some of its objectives and performance levels on its website.

Metro Vancouver illustrates its performance levels for various services using a performance monitoring dashboard. The dashboard educates the public on multiple aspects related to water, including source, consumption and water-related expenditures.

Source: *City of Nanaimo website and Metro Vancouver website*



**PERFORMANCE
MEASUREMENT
& CONTINUAL
IMPROVEMENT**



WHAT IS PERFORMANCE MEASUREMENT AND HOW CAN IT HELP INCREASE THE EFFECTIVENESS AND SUSTAINABILITY OF A WATER UTILITY?

Performance measurement is a component of a water utility's accountability framework that enables the utility to measure how well it is meeting its objectives. Local governments can make use of performance data as a tool to make better, more informed decisions, thereby increasing the effectiveness and sustainability for the water utility. In order to do this decision-makers need useful metrics to be able to:

- ▶ set informed and reasonable targets
- ▶ efficiently allocate resources to areas in need of improvement, and
- ▶ effectively communicate performance to internal and external stakeholders and peers
- ▶ Clearly state costs associated with service levels

Performance measurement is the process of strategically collecting quantitative, and sometimes qualitative, system information called performance indicators to measure the effectiveness, efficiency and cost of a system over time. Performance measurement serves many purposes, including focusing attention on key issues, clarifying expectations, facilitating decision making, supporting learning and improving, establishing and maintaining accountability, and, most importantly, communicating effectively internally and externally.

An effective water utility performance measurement system should be based on activities that can be managed and include well-defined measures that are collected consistently for each of the most important components of the water system and service. This may involve collecting data from more than one department or service area and may include broader organization-wide measures. Since establishing and capturing performance measurement information requires resources, performance indicators should be selected carefully to ensure that the benefits of performance measurement outweigh the costs. Tools and frameworks are available to help you tailor your performance measurement system to the unique needs of your water utility.

The following guidelines can help to identify useful measures and indicators and apply them effectively:

- ▶ Select measures that support the local government's strategic objectives, mission and vision
- ▶ State level of service associated with the performance indicators and costs
- ▶ Select indicators that are economical to measure and verify
- ▶ Start with a small set of indicators in broad categories and gradually increase the number as needed
- ▶ Set realistic targets based on criteria such as customer expectations, improvement over time, relative industry performance or other appropriate comparisons
- ▶ Develop clear definitions for each indicator, ensure that the data for the indicator is collectible and available
- ▶ Consider how measures relate to one another, and how they may be used with other measures in the future
- ▶ Consider cause-and-effect relationships
- ▶ Identify who is responsible for collecting the data, and how the data will be tracked and reported
- ▶ Develop processes to respond to and evaluate results
- ▶ Identify how performance measurement results will be communicated and reported
- ▶ Incorporate continual improvement into the performance measurement system

Performance Measurement and Sustainable Financing

Performance measurement can support a water utility to assess and rate its financial sustainability and to measure how well the utility is meeting its financial goals. Measures related to the liquidity, equity, cost recovery efforts and others provide the context to score financial sustainability. Managers can assess how well full-cost recovery and full-cost pricing strategies are being implemented and can use this information to improve.

Performance Measurement and Asset Management

Performance measurement provides the framework for accountability in an asset management program as it enables the program outcomes to be measured against its intended objectives. Performance measurement can be used throughout the asset management cycle – to assess, plan and implement. Assessing performance using standardized metrics leads to informed asset management plans and streamlined roadmaps for implementation and subsequent evaluation. The integration of performance management and asset management is key to implementing a continual improvement cycle for drinking water services, which is discussed in question 14.

Performance Measurement and Overall System Effectiveness

Performance measurement can support water utilities to improve their effectiveness and efficiency in meeting core utility goals. Performance measures can provide the information to compare performance internally and externally, through benchmarking with other similar utilities. Measures sometimes used as indicators of overall system effectiveness include water quality, energy efficiency, financial performance, customer satisfaction and other important operational factors.

Performance *measurement* is central to the effective *management* of the performance of the utility.

"You can't manage what you can't measure." ~Peter Drucker, author and management consultant



WHAT PERFORMANCE INDICATORS ARE APPROPRIATE FOR A WATER UTILITY, AND HOW DO OTHER UTILITIES PERFORM/COMPARE?

What makes a good performance indicator?

Generally, water utilities seek to provide reliable and sustainable service, by ensuring a sufficient quantity of water that meets public health safety standards, while operating a safe, productive workplace, with a satisfied and informed customer base, all at a minimum sustainable cost. Indicators should adequately align with the specific goals of a local government while taking into account comparability with other water utilities, if benchmarking is desired.

Water utility service goals can be grouped into broad categories or performance areas, such as water quality and quantity, assets, environment and customers. Some water utilities utilize a categorization scheme such as the one listed below. Each of these broad categories will have multiple performance measures, and each measure will have multiple indicators. Some examples of measures and their respective indicators:

PERFORMANCE MEASUREMENT ATTRIBUTES FOR DRINKING WATER

There are several different commonly used frameworks available for local governments to refer to when designing or updating an approach to performance measurement. In the United States, a coalition of major water sector associations, developed an approach to water utility management using best practices from water sector leaders. This approach, known as Effective Utility Management (EUM), includes advice on successful management using ten different water utility attributes:

1. Product Quality
2. Customer Satisfaction
3. Employee and Leadership Development
4. Operational Optimization
5. Financial Viability
6. Infrastructure Stability
7. Operational Resiliency
8. Community Sustainability
9. Water Resource Adequacy
10. Stakeholder Understanding and Support

The attributes are not presented in a particular order, but rather can be viewed as a set of opportunities for improving utility management and operations.

Source: EUM Utility Leadership Group, *Effective Utility Management: A primer for water and wastewater utilities*, 2017

PERFORMANCE ATTRIBUTE (CATEGORY)	EXAMPLE PERFORMANCE MEASURE	EXAMPLE PERFORMANCE INDICATOR
Financial Viability	Budget Management Effectiveness	Revenue to expenditure ratio; Operations and maintenance (O&M); Expenditures (percent of budget)
Operational Optimization	Resource Optimization	O&M cost per volume treated; Energy use per volume treated
Service Reliability	Service Delivery	Number of unplanned service interruptions/100km; Main breaks by material type/100km length
Customer Satisfaction	Satisfied and informed customers	Number of water pressure complaints/1000 people served; Per cent of calls for service resolved within defined level of service

Source: EUM Utility Leadership Group, *Effective Utility Management: A primer for water and wastewater utilities*, 2017 and NWWBI water performance measures

A robust measurement system uses a combination of leading and lagging performance indicators.

- ▶ **Leading indicators** are measurements that signal a change in advance and provide information about the future state of a performance measure. They are sometimes harder to measure, but easier to influence and therefore typically drive proactive, preventative actions.
- ▶ **Lagging indicators** are indicators that become measurable only after the change has taken place and reflect historical states of a performance measure. They are easy to measure but harder to influence and therefore typically drive reactive, corrective actions.

Since leading indicators measure expected performance, they are most useful to inform proactive decisions and adjustments as part of an approach to performance measurement. Leading indicators provide the most benefit when the desired outcome is clearly defined. For example, the number of water quality complaints could be a leading indicator of the level of customer satisfaction.

Performance measurement and benchmarking

External performance measurement, or benchmarking, is the comparison of similar measures or processes across comparable organizations to identify best practices, set improvement targets and measure progress within or sometimes across sectors.

The National Water & Wastewater Benchmarking Initiative (NWWBI) is a partnership that represents 43 local governments across Canada including 19 in British Columbia. The initiative aims to help utility managers achieve continuous performance improvement towards their goals. The stated objective of the benchmarking project is to develop a high-level tool or model that the majority of Canadian water and wastewater utilities can use for managing and monitoring their performance.

Not all categories will be equally important to the internal performance measurement of every water utility. For this reason, regardless of the framework being used, it is necessary to also weigh the relative importance of each category when assessing current levels of performance and choose one or two areas to focus on.

Generally, most utilities seek to provide reliable and sustainable service, and ensure a sufficient quantity of water in a safe, productive workplace, meeting public health safety standards, with a satisfied and informed customer base, all at a minimum sustainable cost. Indicators should adequately reflect these goals, taking into account local government context. Benchmarking and information sharing with other utilities can complement continual improvement processes and create a community of practice to accelerate improvement processes.

CHARACTERISTICS FOR GOOD PERFORMANCE METRICS

- Easily understood by local government departments, Council/Board and the general public.
- Focused on results or desired outcomes and defined with a specific goal or expected level of performance.
- Well-defined and considers both the quantitative (how much) and the qualitative (how well) aspects of a service.
- Balanced to include cost savings along with quantifiable and qualitative metrics.
- Developed by seeking stakeholder input early in the process.
- Developed with a written definition and well-defined calculation showing how data will be reported.
- Realistic and sustainable in terms of available resources, funding and timeliness and recognizes any externalities that are beyond the control of the local government.
- Comparable, provides opportunities to review performance over time internally and externally.
- Overall, follows a SMART format – Specific, Measurable, Achievable, Realistic and Time-related.

Source: AGLG Perspectives Booklet – Improving Local Government Procurement Processes

CHALLENGES IN SETTING PERFORMANCE METRICS

- Identifying targets that are achievable within the required time frame.
- Setting targets that are achievable within the budgeted level of resources.
- Expressing targets in a clear and simple way.
- Achieving alignment between compensation framework and performance expectations.
- Setting targets that meet the needs of senior management and Council/Board.
- Collecting and reporting on data that is practical and sustainable.
- Ability to retrieve historic information or track over time.
- Developing a formula, definition or model for consistency in tracking performance metrics.
- Revising metrics as their relative value to the organization changes over time.

Source: AGLG Perspectives Booklet – Improving Local Government Procurement Processes



WHAT IS CONTINUAL IMPROVEMENT AND WHY IS IT IMPORTANT?

Continual improvement occurs when lessons learned through performance measurement processes are used to adjust and make improvements with the intention of meeting or exceeding performance targets.

Continual improvement should be a cycle—an evaluative loop where performance measurement is used with reporting, testing, analysis and improvement activities.

When a local government integrates such a system into its everyday approach to management and operations, it can reinforce and demonstrate the work it does to bring value to its community on a continual basis. This process can also be used to improve and adapt financial policies and practices in response to changing conditions.

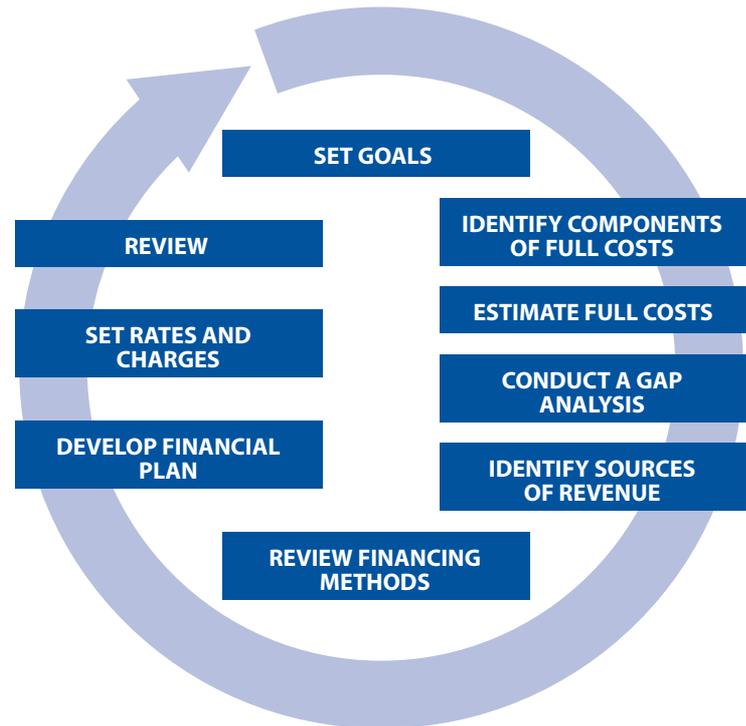
Continual improvement requires the pre-establishment of performance measures (or indicators) and targets associated with those measures. This process defines how a local government responds to information it has obtained about its current performance. It asks whether it can do better and, if so, how and what steps it can take to do so and then following through on those actions.

Continual improvement for effective and sustainable utility management includes:

- Conducting a comprehensive self-assessment – informed through staff engagement – to identify management strengths, areas for improvement and priorities
- Regularly engaging with stakeholders to identify areas in need of improvement
- Review and follow-up of ongoing improvement projects
- Establishing and implementing performance measures and the specific internal targets associated with those measures
- Defining and implementing related operational requirements, practices and procedures

- Defining roles and responsibilities to establish accountability for assessing and implementing performance improvements
- Conducting regular measurement and evaluation activities such as operational and procedural audits
- Implementing recommended changes that result from evaluations

Continual improvement and Asset Management



The Asset Management British Columbia (AMBC) asset management process is a continual three phase cycle – Assess, Plan, Implement. Performance measurement enables this continual process by acquiring the data used to make informed decisions about asset management strategies, including sustainable financing.

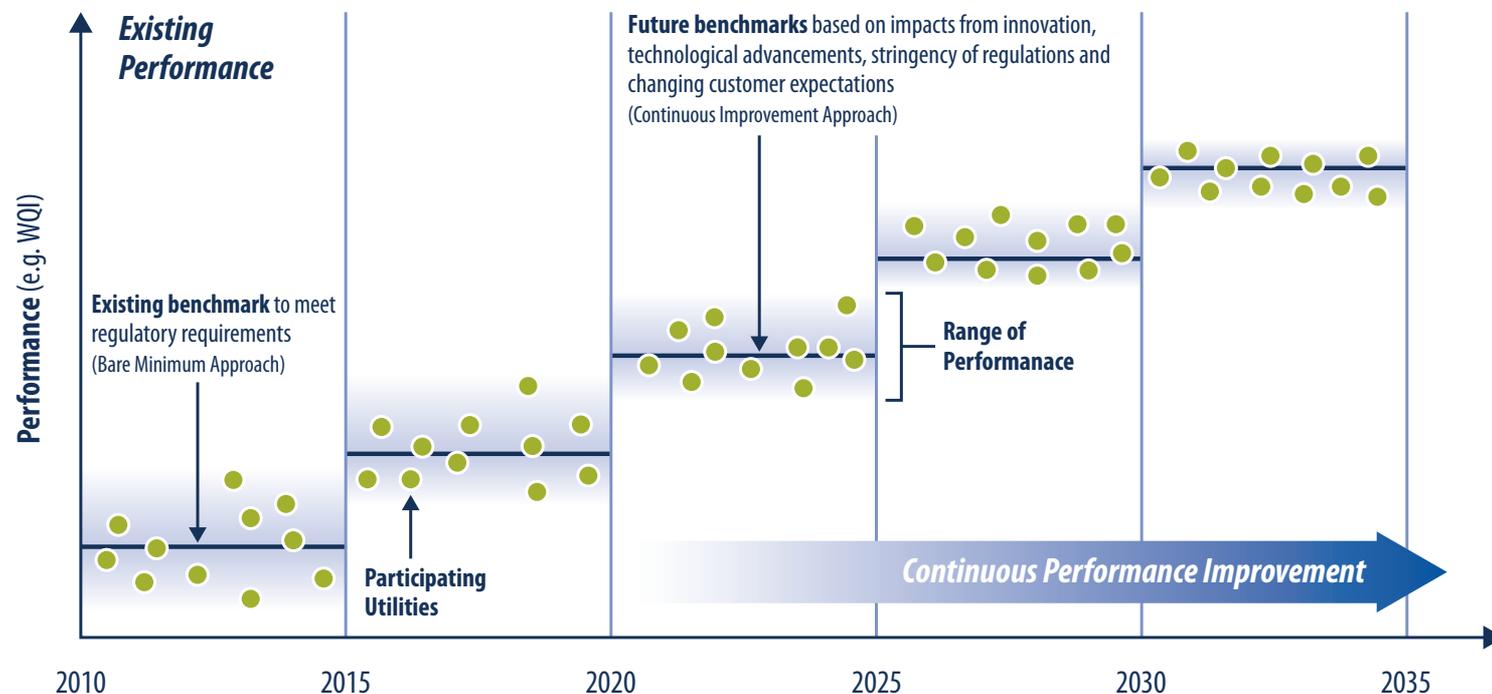
A local government can consider the following continual improvement process principals to improve its asset management program:

- Establishing objectives and strategies
- Assessing the capacity, demands and results of the service
- Addressing vulnerabilities through risk assessment
- Planning for future needs
- Providing comprehensive reporting
- Implementing short-term and long-term plans to ensure the sustainability of the service

A continual improvement process for asset management provides data for the utility to assess service level changes and the resources required to implement the changes.

Continual improvement processes can be relevant for many of the concepts introduced in this document, including asset management, full cost accounting, rate setting, and performance measurement. Utilizing these tools will assist local governments in developing a strong foundation to sustainably manage their water services for years to come.

CONTINUOUS PERFORMANCE IMPROVEMENT



Source: Bereskie et al., (2017), *Framework for continuous performance improvement in small drinking water systems*, Science of the Total Environment, 574, p.1405-1414



WHERE CAN I LEARN MORE ABOUT PERFORMANCE MEASUREMENT FOR DRINKING WATER SERVICES?

In British Columbia, there is no required performance measurement framework or set of indicators related to drinking water services. However, there are some resources and initiatives that can be a helpful starting place for developing a performance measurement framework for your local government:

- Government Finance Officers Association (GFOA) – [Best practice recommendations on Performance Measures](#)
- National Water and Wastewater Benchmarking Initiative Tables of Water [Performance Measures](#)
- [American Water Works Association Utility Benchmarking Performance Indicators](#)
- [American Water Works Association - Resources & Tools](#)
- The Effective Utility Management (EUM) [Primer for Water and Wastewater Utilities](#) from the U.S. Environmental Protection Agency

AGLG contact information

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