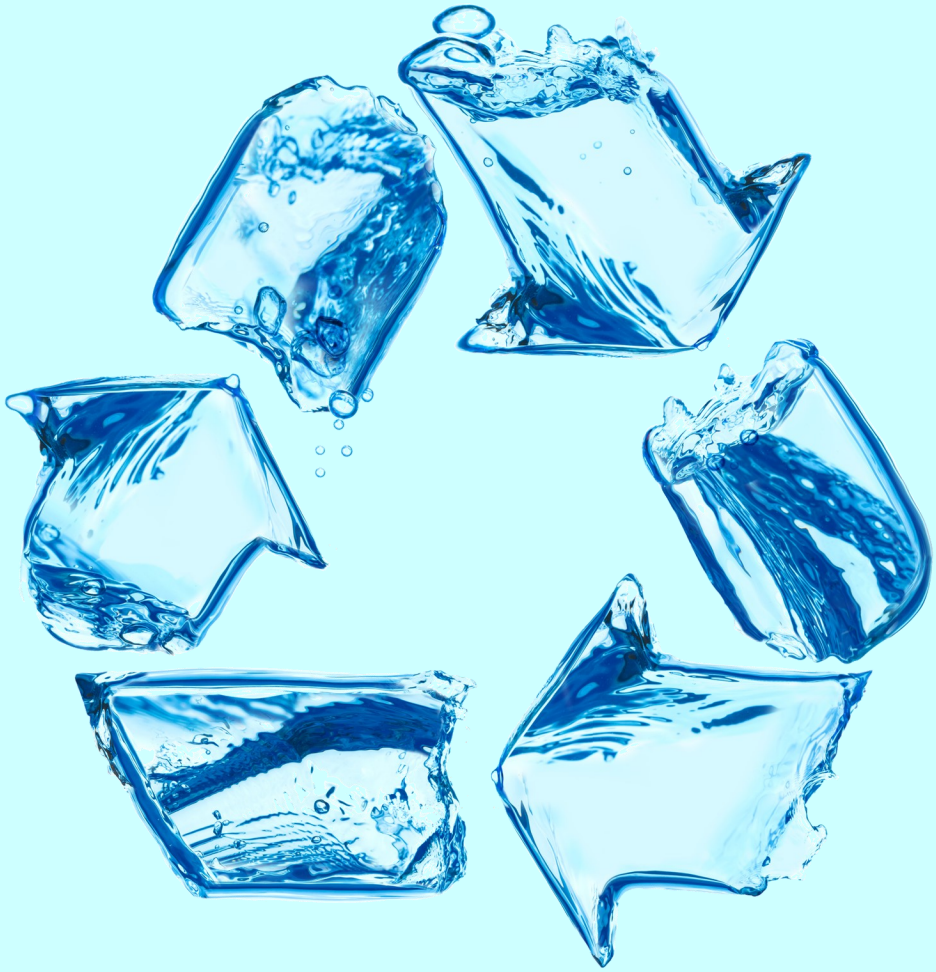
Towards a Sustainable Utility

A Guidance Document for water, wastewater and stormwater utilities



Developed by the Utility Leadership Committee of the Canadian Water and Wastewater Association

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About this Guide

The range of this content has been created by and for water, wastewater and stormwater utility managers -- to offer guidance for navigating towards being sustainable and resilient water services.

What do we mean by the term sustainable?

In simple terms, it is the capability of being sustained – or to be able to continue for a long time.

The International Water Association (IWA) states that sustainable water systems should provide adequate water quantity and appropriate water quality for a given need, without compromising the future ability to provide this capacity and quality. The three-fold goals of 1. Economic feasibility; 2. Social responsibility; and 3. Environmental integrity, are linked to the purpose of water use. (https://www.iwapublishing.com)

The United Nations states that water is a finite and irreplaceable resource that is fundamental to human well-being and is only renewable if well managed. They go on to say that, managed efficiently and equitably, water can play a key enabling role in strengthening the resilience of social, economic and environmental systems in the light of rapid and unpredictable changes. (https://www.un.org)

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Introduction

Recognizing the necessity of sustainability, and that it encompasses all facets of a utility service, CWWA's Utility Leadership Committee first adopted a position statement on Sustainable Water Services. The Committee then directed the development of this document to provide greater guidance. We soon learned that this document addressed the work of all of CWWA's technical committees and the contribution team grew accordingly.

In developing this Guidance Document, substantial thought has gone into structuring the topics, including laying out challenges, best practices and resources. It also sets out a helpful framework, particularly for those of you just wading into this work toward having a sustainable utility. Even the selected challenges are structured, beginning with the operational aspects within a utility's domain, moving into global ones related to operations, followed by ones that pertain to taking on a role to influence others.

While this framework can act as a set of bones, a useful guide must reflect our ever-changing conditions. We have chosen to make this an online, accessible and living document. As our intent is to briefly introduce topics and refer you to further resources, we hope to regularly edit and update these references.

CWWA's Position Statement on Sustainable Water Services

A sustainable water service recognizes and incorporates social (service level and affordability), environmental and economic factors, while ensuring full cost recovery and intergenerational equity. There are many benefits to communities where utilities provide sustainable water services (water, wastewater and/or stormwater).

Over the long-term, there may also be significant risks to public health, local economies and the environment if water services are not truly sustainable. However, there are a number of key challenges or barriers to achieving sustainable water services.

Utilities should plan to move closer to sustainable water services, recognizing those challenges, and monitor their progress to that objective.

Communication with, and engagement of, the public and elected officials as to the social, environmental and economic value of water services will be essential in that process.

How to use this Guide

How to Use this Guide:

You will find key factors identified that need to be considered on the road to moving your utility towards being a truly sustainable water service. The first part of this Guide is concentrated into 8 challenges, followed by an expanded look at two major topics. Each topic area will refer you to a list of support and other resources for more details. This guidance is meant to help you shift your utility from being a reactive, operational model towards a more proactive, customer-focused and fiscally-sound management approach.

We have divided this Guide into four parts, offering you a framework for future reference:

Part One – Challenges, Considerations and Best Practices

We start by briefly identifying the most common challenges. We note important considerations and suggest some best practices with a few examples from municipalities that have taken successful steps toward sustainability. We then list a few references and referrals for much more detail on each topic.

Part Two – Full Cost Recovery Framework

Next, we focus on a key pillar for moving towards sustainability – a full cost recovery framework that brings together the many aspects that need to be considered for long term financial planning. This includes gathering the various related data, as in a Cost of Service (CoS) study.

Part Three – Influencing the Adoption of Plans - Communications

Identifying appropriate change is one thing, while influencing adoption is another. We look at the importance of engaging with the public, elected officials and other stakeholders to move from 'plans' to 'implementation'. This critical concept is too often forgotten until it is too late.

Part Four – Moving Forward

Finally, we identify some of the recurring themes throughout this guidance document. We wrap up with some recommendations as to priority areas for future evaluation and research. We conclude with some additional resources and a self-assessment tool that can help with planning.

Of course, each situation is unique. Your utility's specific circumstances will drive the priorities and identify feasible options. Look at the way challenges are framed in Part One to create priorities and consider different approaches that are needed for different kinds of challenges. Responses will vary depending on the set of challenges and opportunities each presents, as can be observed in the Canadian Water Network's summary report, "Water Management Trends in Canadian Municipalities"

Part One: Challenges, Considerations & Best Practices

The list of challenges we face could be endless. Here we identify eight significant challenges we likely all share. They represent a range:

⇒ **Internal challenges related to our operations**

⇒ **Global challenges beyond our control**

⇒ **External challenges related to our customers and stakeholders**

Aging/Deteriorating Infrastructure

It is well-documented that infrastructure in municipalities across Canada is aging. This is best demonstrated in the Canadian Infrastructure Report Card found at www.canadianinfrastructure.ca. All infrastructure has a lifespan, but historic underinvestment has led to premature deterioration and elevated maintenance costs - creating challenges for consistent and reliable service delivery. In addition to the costs to replace infrastructure, your sustainable utility must budget sufficient operational resources to ensure infrastructure is properly maintained to optimize performance and to meet or exceed its intended lifespan.

Best Practices:

A robust Asset Management program is essential to addressing your infrastructure challenges:

- Asset management is an integrated, lifecycle approach that brings together all physical and financial aspects of existing and planned infrastructure systems, to ensure the right investments and activities happen at the right time with the right risks to provide the desired level of service.
- Properly planned asset management strategies will: Inform rates; identify performance challenges; enable early detection of impending asset failure; and permit action before a potentially catastrophic failure.
- Starting an asset management program will identify gaps in current data on asset inventory and condition, which can then be prioritized and addressed in order of criticality. It is not necessary for you to have a complete data set of your assets for an asset management program to yield significant benefits.
- An asset management program, and the rigour that it necessitates, will result in sound, defensible operational and capital expenditure programs. It will help communicate to elected officials, the public and other stakeholders the current condition of your assets, and the investments required for them to be in a State-of-Good-Repair consistent with the required service levels.
- Asset management is not just about data and software - it can help precipitate operational and cultural changes within a utility that may be required for the long-term, sustainable delivery of its mandate.

Key:

At least start! Do what you can, with resources you have, to create an asset inventory, and then start to assess what you can. Set financial and human resources in place to focus on this. Seek available funding, support and guidance.

Support and Resources:

A great many resources are available to utilities and municipalities looking to start or improve their asset management:

- Federation of Canadian Municipalities (FCM) - guidance and funding
  https://fcm.ca/en/resources/mamp/asset-management-resources
- Canadian Network of Asset Managers (CNAM) – professional association
  https://www.cnam.ca
- Public Sector Digest – Canadian professional publication and database
  https://www.publicsectordigest.com
- PMAC Canadian Asset Management Association
  https://www.pemac.org
- AWWA – Water, Wastewater and Stormwater Infrastructure Management
  https://www.awwa.org/

Asset Management Achievement Award

In 2020, PEMAC, an Asset Management Association in Canada, instituted an "Asset Management Achievement" award. It is for teams who make significant steps on the journey to establishing asset management practices and culture in their organization. The first winner of the award was the Cowichan Valley Regional District (Vancouver Island, BC). This team showed that, over a period of four years, with the support of the CAO, they have built significant interdepartmental buy-in for a Strategic Asset Management Plan which received final Board approval in February, 2020. The team recognizes that this achievement is just the beginning of the next stage on the asset management journey. But they are confident that their efforts have built a firm foundation for establishing Level of Service targets, implementing risk-based decision making and developing consistent business processes across the life cycle of assets.

Changing Workforce Demographics

Our water sector in Canada has been experiencing a significant turnover in staffing. This is expected to continue over the next decade as many senior employees enter retirement. If not carefully planned, this loss of skilled workers can have operational and financial implications - particularly if it creates large voids in operational capacity affecting the ability to meet compliance, overtime costs, or delays in major projects. Meanwhile, the demographics of the incoming workers has changed dramatically to introduce a younger workforce made up of more women and workers of diverse cultures. As utilities we must not only have a long-term workforce plan, but one that appreciates diversity and inclusivity.

Best Practices:

Tackling this challenge requires an internal as well as an external strategy.

- Internal programs begin with succession planning to understand your current workforce and to see where the staffing changes are most likely to occur and when. Preferably, look within your utility for talent and potential. Consider employee development as an investment and part of an overall training program.
- Leading utilities use programs such as: Cross-training operations staff; talent management programs; developing temporary "acting" assignments for employees into management positions; internal training to retain and develop Level 4 operators from within; as well as mentoring and coaching programs with training. It is critical to recognize the diversity of your team and ensure that all opportunities in your workplace are being inclusive.
- If your staffing answers lie outside of your utility, you need to develop a program to promote your opportunities and then recruit (and retain) the best talent. Again, considering diversity and inclusivity in an external program will deepen the talent pool to draw from and increase your chances for long term success.

Key:

The first step is to start with a Gap Analysis to understand your current staffing, the expected departures, the current training and development of staff as well as what is missing. Another key to success is to approach this as a team - for the utility leadership to be collaborating with the HR department and the Union.

Support and Resources:

- US Environmental Protection Agency – America's Water Sector Workforce Initiative America's Water Sector Workforce Initiative (epa.gov)
  https//www.epa.gov
- AWWA Journal – Improving Utility Succession and Workforce Development Planning
  https://awwa.onlinelibrary.wiley.com/doi/full/10.1002/awwa.1338
- Water Quality and Health Council – Building the Workforce for Tomorrow's Safe Water
  https://waterandhealth.org/safe-drinking-water/drinking-water/building-the-workforce-for-tomorrows-safe-water/
- CWWA's Utility Leadership Committee is developing a guidance document on this topic to be released in 2021 as part 2 of Towards a Sustainable Utility
- AWWA Workforce Resources - Workforce | American Water Works Association (awwa.org)

A Strategy for BC

The BC Water & Wastewater Sector Workforce Profile was published in 2015 as a joint project of the BC Water & Waste Association and the Environmental Operators Certification Program. This initial survey and analysis provided tremendous insight into the general workforce situation in that province and their challenges. But the lessons learned are relevant to all provinces, if not just the methodology. This valuable information led to the 2017 BC Water & Wastewater Workforce Strategy with recommendations on meeting those challenges.

Water-and-Wastewater-Sector-Workforce-Strategy-Executive-Summary-October-2017.pdf (eocp.ca)

Climate Change

We are all aware of the impacts from global changes in climate. All areas of the world are experiencing altered climate patterns leading to the extremes of prolonged drought, or severe storms while ocean levels rise. These extremes, and rising temperatures also alter the biology of our water sources, such as algal blooms, affecting treatment processes. As water utilities working towards sustainability, we must recognize these increased challenges and incorporate them into our risk management and long-term planning.

Best Practices:

Effectively addressing climate change at a municipal level requires a flexible, iterative process. Adaptation and Greenhouse Gas (GHG) reduction should be considered wherever opportunities and threats are identified. Climate change is a "lens" that must be embed broadly across your organization.

Addressing climate change requires:

- Projections – How will the climate change locally and regionally?
- Vulnerability and Risk Assessments – Some impacts of a changing climate are not obvious from a review of projections alone. What are the interactions between projections, water systems, and the services you provide? Do these interactions reveal new or emerging threats? Projections must be incorporated into vulnerability and risk assessments to understand the impacts on infrastructure and communities.
- Interdependencies and Unfamiliar Risks – One of the more challenging requirements for any organization is to identify issues and interdependencies for which it is not structured to address easily. This step may not only identify risks (current or future) that would not otherwise be highlighted, but it can also help identify new, efficient, and cost-effective strategies.
- Adaptation and Resilience Planning – This is where solutions can be developed for various vulnerabilities and risks. Integration with asset management planning principles to maintain a lens of long-term sustainability is crucial in this phase.

Key:

Start now! We do not always have the luxury of precise knowledge or refined practices. Continue to innovate, embed practices, and "mainstream" solutions! A flexible, iterative, and forgiving process is required to avoid lost opportunities.

Support and Resources:

- Canadian Centre for Climate Services https://www.canada.ca/en/environment-climate-change/services/climate-change/canadian-centre-climate-services.html
- PIEVC Protocol: Assess the Vulnerabilities of Infrastructure http://www.pievc.ca/
- Building Adaptative and Resilient Communities Program https://icleicanada.org/barc-program/
- Under One Umbrella: Practical Approaches for Reducing Flood Risks in Canada https://www.intactcentreclimateadaptation.ca/wp-content/uploads/2020/11/Under-One-Umbrella-Press-Release-EN-1.pdf
- AWWA – Climate Change Action Plans: Adaptive Management Strategies for Utilities - M71 Climate Action Plans - Adaptive Management Strategies for Utilities (awwa.org)
- AWWA Workforce Resources - Workforce | American Water Works Association (awwa.org)

Planning for Climate Change

Cities across Canada are starting to recognize the close link between adaptation, mitigation, and energy, and that urgent action is required. Here are a few examples.

The City of Ottawa is building a comprehensive Climate Change and Energy Program. It is in the process of embedding climate analysis and decision-making throughout its infrastructure program including: The Asset Management Plans; Wet Weather Infrastructure Management Plan; Sewer Design Guidelines; Infrastructure Master Plans and Official Plan. Climate change and energy | City of Ottawa

The Region of Peel has developed a Climate Change Management Plan that provides guidelines for all infrastructure investment in the region:

Climate Change and Energy Management - Regional Government - Region of Peel (peelregion.ca)

Both Edmonton and Calgary have very comprehensive strategies in place for climate change adaptation. Edmonton is part of the Covenant of Mayors initiative while Calgary is part of the Rockerfeller 100 Resilient Cities project. Both are major climate change adaptation initiatives with many parallel approaches and great information-sharing with other leading communities around the world.

https://www.edmonton.ca/city_government/environmental_stewardship/climate-change-adaptation.aspx

https://www.edmonton.ca/city_government/documents/Climate_Resilient_Edmonton.pdf

https://www.globalcovenantofmayors.org/press/sign-edmonton-declaration/

https://www.calgary.ca/uep/esm/energy-savings/climate-change.html

https://www.calgary.ca/uep/esm/climate-change/climate-actions.html

https://resilientcitiesnetwork.org/cities/calgary/

Source Water Protection

In addition to the climate change impacts noted above, there are multiple external risk factors that threaten the quality and sustainability of our water sources. A community's water resources can be threatened by the industrial and agricultural activities in that region (by inefficient use of the limited water supplies or by discharges/ run-off from enterprises) and by how the community collects and manages its sanitary sewage and stormwater. Best practices for sustainable utilities include utilities and the communities.

Best Practices:

- Undertake an ecosystem reconnaissance phase to characterize the watershed from both an aquatic and terrestrial perspective. This should include: Baseline species inventories; historical water quality records; and characterization of lake sediment profile. Analysis of the profile to approximate historical water quality parameters of the lake prior to the anthropogenic influences of the past two centuries helps to set water quality goals within the limits of local geology. It also serves as a 'report card' for evaluating effectiveness of source water protection efforts over the long term.
    - Baseline species inventories include forests, streams, lakes, and fields. The species present can have a direct impact on water quality (fresh water mussels, sponges) and quantity (forests). This approach takes advantage of pre-treatment aspects of Natural Ecosystems.
- Risk analysis provides direction when seeking to mitigate effects of climate change by ensuring protection of wetlands, and forest management that includes strategies to shift forest composition toward species that are well adapted to future conditions as predicted by modeling.
- Apply a multi-barrier approach to source water protection. Engage the community with source water protection committees, local land use bylaws, educational efforts, and collaborative opportunities with neighboring properties to encourage good stewardship of shared resource.
- Value source water areas as municipal assets and invest in landowner engagement in addition to acquisition of key parcels where possible.
- Account for and dedicate specific funds to source water protection rather than simply incorporating this into a broad Operations and Management Budget. This ensures dedicated funding specifically to protection of watershed areas.

Key:

Your comprehensive source water protection strategy should be multi-layered and include strategies for adaption to and mitigation of the modeled conditions of a future climate. Vitally, source water protection planning must include strategies to manage human behaviour in source watershed areas. Promoting good stewardship and appreciation of our shared resource is an important first step.

Support and Resources:

- Water Canada – Taking Steps Toward Reconciliation and Watershed Governance Taking Steps Towards Reconciliation and Watershed Governance (watercanada.net)
- Province of Nova Scotia – Developing a Municipal Source Water Protection Plan https://novascotia.ca/nse/water/sourcewater.asp
- Conservation Ontario – Valuing Benefits from Watershed Management http://www.archives.gov.on.ca/en/e_records/walkerton/part2info/partieswithstanding/pdf/CObenefits.pdf
- Universities Council on Water Resources – Economic Value of Nature and Ecosystems in the Delaware River Basin https://www.wrc.udel.edu/research/economic-value-of-nature-and-ecosystems-in-the-delaware-river-

Valuing Source Water as a Municipal Asset

The Municipal Natural Assets Initiative (MNAI) https://mnai.ca/ has been working with two BC municipalities to understand and define the value of natural assets, e.g., their watersheds and aquifers.

The Comox Valley Regional District (CVRD), City of Courtenay, Town of Comox, Village of Cumberland and K'ómoks First Nation signed a memorandum of understanding with the MNAI to value natural assets in the Comox Lake watershed which provide safe, reliable drinking water and other environmental, cultural and economic benefits. The project includes detailed guidance material, workshops, technical support, economic analysis, modelling and development of strategies and methods for long-term management of their natural assets. https://www.comoxvalleyrd.ca/node/6707

The Town of Gibsons obtains its drinking water from a confined aquifer beneath it. The aquifer filters and stores enough water to supply the Town's present and future projected populations. If the aquifer became degraded, engineered assets would be required to provide the same services; conversely, a well-managed aquifer could provide clean drinking water in perpetuity. The Town included the aquifer in its emerging municipal eco-assets strategy and determined actions, timelines and costs needed to maintain aquifer health. **https://mnai.ca/key-documents/**

Rising Energy Costs

The energy bills to run a municipality's water and wastewater operations are typically in the top three costs of a municipality's budget. While we are beginning to see more renewable energy options, most municipalities will still be facing rising energy costs for the next few decades. External to our utilities, costs for traditional energy sources continue to rise, driven primarily by increases in production/delivery costs and taxes. Internally, aging equipment requires more energy to operate while population sprawl patterns require more energy for pumping. At the same time, our utilities require significant investments to reduce the environmental footprint, to improve infrastructure resilience, and to achieve net-zero carbon emission targets.

These rising energy costs will have a direct impact on a utility's operations and the water and wastewater rates. As such, energy consumption will be a key operating factor influencing the selection of water and wastewater treatment methods and pumping options to meet water demand and to efficiently address local geography and topography. A future-oriented utility will choose a sustainable approach to move toward being energy-neutral, if not contributing more energy than they consume.

Best Practices:

- Reduce Wasted Energy – Minimizing water leaks and wastewater infiltration and inflow will dramatically reduce the energy required to treat and pump water that is lost to leaks, or to collect and treat wastewater. Such leaks can represent 30-40% loss in production for many communities.
- Optimization – Active monitoring of pumping operations, especially high lift pumps, with expert tool(s) ensures pumps are operating in the most energy efficient zone and also helps prevent pump cavitation.
- When pumps fail, consider replacement with energy efficient designs, rather than rebuilding, to ensure efficient technologies incorporated into the system.
- When designing or replacing large size valves for the water transmission network, select energy efficient design valves especially for check valves, which will save more than 10% energy loss through valves.
- Technology Assessment and Life-cycle Costing – When selecting new treatment or distribution technologies, you should consider more than just the purchase and installation price. The entire range of costs over the expected life of the asset should be assessed, including energy costs.
- Energy Production from Waste – Once you've reduced your cost of operations as much as possible, consider producing energy from renewable resources produced at your facilities. Utilities are moving toward a net-zero or even a negative energy draw by producing energy from their own renewable sources such as heat, biogases and sludge, or from alternative sources like solar or wind.

Key:

The key is to recognize energy as a critical factor in your overall cost structure and focus efforts toward reducing your overall energy cost structure. Assign staff or hire consultants to assess energy cost reduction opportunities, set targets and build support to show the net return of wise energy choices.

Support and Resources:

- Quality Urban Energy Systems of Tomorrow (QUEST) www.questcanada.org
- WEF – The Energy Roadmap: A Water and Wastewater Utility Guide to More Sustainable Energy Management - The Energy Roadmap (e-wef.org)
- WEF – Water Energy Future Report - wefasewater-energy-future-workshop.pdf
- Alliance for Water Efficiency – Water & Energy Reports - Water and Energy | Allianie for Water Efficiency
- Driving Initiatives – Toronto Water's Twenty-Year Energy Optimization Plan - Access Water | Driving Initiatives - Toronto water's Twenty-Year Energy OptimiZation
- Implementing A Sustainable Energy Efficiency Improvement Program at DC Water - Access Water | Implementing A Sustainable Energy Efficiency Improvement Program at DC Water

EPCOR's Climate Change and Energy Management Plan

EPCOR provides water, wastewater, and stormwater services to the City of Edmonton and many communities as well as industrial sites in Canada and the US. EPCOR is proud of its proactive approach to utility resiliency, energy efficiency, and achieving greenhouse gas (GHG) emission reduction.

EPCOR's plan includes: Eliminating PCBs (polychlorinated biphenyls) in electricity infrastructure by 2023; reducing emissions and energy use from utility fleet vehicles; promoting household energy efficiency and water conservation; upgrading utility equipment and building envelopment to improve both energy efficiency and reduce GHG emissions. We are also working on producing local, renewable electricity, such as a 12 MW solar farm designed to power the E.L. Smith Water Treatment Plant. In addition, EPCOR has invested in an offtake agreement for Renewable Electricity Certificates ("RECs") from a newly constructed wind farm in Southern Alberta. These projects will provide EPCOR with enough RECs to offset 100% of its electricity consumption inside the City of Edmonton.

EPCOR is currently conducting an energy audit by external consultants of its water and wastewater treatment plants in order to produce a practical road map to achieve a net-zero emission utility status.

Changing Water Use

In the past two decades, water demands have been declining in most Canadian communities despite growing populations. This is largely due to major improvements in the water efficiency of toilets, clothes washers, and other fixtures and appliances. For many of us, this decline in water use has resulted in lower than anticipated utility revenues, challenges with maintaining chlorine residuals in water distribution systems, and increased odour, as well as corrosion management issues in wastewater systems.

Yet, in most communities benefits, of more efficient water use are not fully realized. Water demand forecasts and unit rates used for infrastructure planning have not effectively incorporated changes in unit demands. It results in oversized infrastructure with higher than necessary lifecycle costs and exacerbated water quality issues.

Best Practices:

Following these practices, your utility can maximize the benefits of declining unit water demands and address the associated challenges:

- Develop and regularly update a robust demand forecast that incorporates these elements from A Community Guide for Evaluating Future Urban Water Demand (link below):
    - Improvements in water efficiency in each major sector end use, including passive reductions and the expected results of conservation programs and development of non-potable water infrastructure
    - Changes in economic activity in the community
    - Changes in water price
    - Consistency with other plans for the community
    - Planned or anticipated changes in land use, particularly including densification that reduces irrigated landscape area per capita
    - Climate change and drought cycles
    - The impacts of universal metering in communities with a significant number of unmetered retail connections
    - Allowance for uncertainty in the forecast, and variability in demands
- Regularly review and adjust utility rates to reflect changing water demands based on historical trends and a robust demand forecast.
- Communicate with customers on the value and cost of water and wastewater services, including average annual costs of service per household, and in comparison with other utility services and household essential needs.
- Include appropriate allowances in rates for variability and utilize reserve funds to balance variations in annual revenue.
- Adopt rate structures that reduce revenue risk while providing an incentive to conserve water, such as an inclining block residential rate structure with a fixed charge that covers basic operating expenses, and a top block that provides a strong price signal for excessive water use.
- Review and update design unit flows in engineering standards for new infrastructure to reflect current plumbing code and household appliance water efficiency ratings, with an appropriate safety factor to address uncertainty.
- Incorporate robust forecasting in utility master plans and hydraulic models to ensure that sizing and timing of capacity related projects is optimized to minimize lifecycle costs and to avoid performance problems associated with oversized infrastructure.

Key:

The cornerstone of effective planning for your utility infrastructure and finance is a robust, accurate long-range forecast of water use. Changes in urban water use over the past 20 years were not accurately predicted. Extrapolating historical trends into the future will yield inaccurate results. A long-range forecast must account for changes in end uses of water, including an understanding of fixture and appliance efficiency standards, and the impacts of densification and other land use changes on seasonal water demand.

Support and Resources:

- Heberger et.al. A Community Guide for Evaluating Future Urban Water Demand. Pacific Institute, 2016. https://pacinst.org/publication/community-guide-evaluating-urban-water-demand-forecasts/
- Cooley et.al. Integrating Water Efficiency into Long-Term Demand Forecasting. Water Research Foundation, 2018. https://www.waterrf.org/research/projects/integrating-water-efficiency-long-term-demand-forecasting
- Water Conservation Tracking Tool. Alliance for Water Efficiency. https://www.allianceforwaterefficiency.org/resources/topic/water-conservation-tracking-tool
- AWWA – Water Resources Planning & Sustainability - Water Resources Planning & Sustainability | American Water Works Association (awwa.org)

Using End Use Analysis to Optimize Planning in Greater Victoria

The Capital Regional District (CRD), serving greater Victoria, BC, has incorporated rigorous forecasting and demand management as core components of its strategic plans for its water supply system since the late 1990s. Their plans for water supply infrastructure and demand management programs have consistently been grounded in an end use-based, long range forecast. The forecast incorporates anticipated changes in plumbing fixture and appliance efficiency in households and the industrial, commercial and institutional sectors, as well as changes in irrigation practices. The forecast and strategic plan are updated every five years. This enables methodology and management plans to adapt to changing conditions and to continuously improve.

One tangible but indirect benefit of this rigorous planning and forecasting has been cost savings in pump station and force main upgrades for the CRD's Core Area Wastewater Treatment project. Through wastewater flow monitoring and end use analysis, the CRD has been able confirm that reductions in dry weather flows over the past decade correlate very well with indoor (winter) residential water demands. Knowing that unit wastewater flows have permanently decreased, in combination with an effective wet weather flow management program, has given the CRD the confidence to reduce the scope of the conveyance works for the wastewater project. This has resulted in saving an estimated $20 million in capital costs plus associated operating costs.

Pricing and Affordability

Growth, aging infrastructure and higher energy costs, are just a few of the pressures that are having an impact on the costs of water and wastewater services. At the same time, decreased consumption due to conservation and low-flow fixtures, has resulted in a reduction of revenues for our utilities. As costs and revenues continue to diverge, water and wastewater rates must increase to: meet our revenues needs; adhere to full cost recovery principles; and ensure utility financial sustainability. However, rates are increasing at a staggering pace across many municipalities, often in excess of annual inflation indices. These realities have created utility pricing practices that are becoming unaffordable for many customers, and can lead to stress/anxiety, payment arrears, and in extreme cases, service shutoffs that exacerbate existing social challenges. Whether this is seen as a utility-customer issue, a social services issue, or a combination of the two, as responsible utilities, we must take the concern of affordability into account.

Best Practices:

- Find ways to support customers in decreasing water use and loss. This can have lasting impacts on reducing water and wastewater bills, e.g., offer rebate programs for installation of low-flow fixtures, and/or implement programs to help low-income customers find and fix sources of leaks in their households.
- Utilize, where possible, government grants/subsidies to offset the costs of large investments (i.e., capital upgrades) to help lower annual rate increases.
- Implement alternative pricing models, such as the inclusion of a "life-line" rate that provides a basic monthly volume of water free-of-charge to all (or low-income) customers. Usage in excess of the life-line amount would then be charged based on regular established volumetric rates.
- Implement different mechanisms to support customers who are struggling with affordability, such as alternative/reasonable payment plans, deferred payments, bill forgiveness/relief, elimination of late fees, for example:
- Work with government departments or community social groups to implement programs that cover a portion of utility bills for low-income customers.

Key:

Be very directed and purposeful. Use an appropriate benchmark to define affordability (median household income is not always a good measure). Be intentional with targeted affordability initiatives for customers/communities in most need. Implement measures that directly address issues of affordability, rather than mechanisms that only defer them (e.g. bill forgiveness may be a more appropriate option for some customers than deferred payments).

Support and Resources:

- Joint AWWA/NACWA/WEF Report
  https://www.awwa.org/
- Canadian Water Network – Balancing the Books Report
  https://cwn-rce.ca/report/balancing-the-books-financial-sustainability-for-canadian-water-systems/
- USA EPA
  https://www.epa.gov/
- US Water Alliance – An Equitable Water Future; a National Briefing Paper
  http://uswateralliance.org/sites/uswateralliance.org/files/publications/uswa_waterequity_FINAL.pdf

Halifax Water's H2O (Help 2 Others) Program

Originally launched in 2011, Halifax Water's Help 2 Others (H2O) Program provides financial assistance to low-income customers who are having a hard time paying their utility bill. Eligible residents can receive up to $275.00 of support in a 24-month period. This program is unique as it is entirely funded by Halifax Water and its employees, where Halifax Water will match staff donations, up to a maximum of $25,000, annually.

Another unique component of this program is that it is administered in partnership with the Salvation Army. Applications from customers are received and reviewed by the Salvation Army and applicants can be informed of their eligibility within 5 days. Approved applicants have funds applied directly to their Halifax Water utility account.

The H2O program is well structured, with clearly defined and targeted eligibility criteria for low-income customers. It has predictable and reliable annual funding and takes advantage of local partnerships to support its administration.

More information on the H2O program can be found **here**.

Increased Customer Expectations

Simply put, our customers have changed … dramatically. No longer are they distant, silent customers, complacent to receive the odd water bill insert and see the odd notice in the newspaper. Maintaining customer satisfaction helps promote sustainability if customers understand the value of the service they are receiving, the cost of providing it, and the need for periodic increases in rates, fees and charges. Modern communication systems and rapid access to information on the internet has developed, in all of us, new expectations. This requires entirely new communications strategies, and updated business processes, as well as technical tools to build and maintain relationships with our customers and stakeholders. This places significant demands on utilities with regard to sharing information in an open and timely manner and to provide proactive, as opposed to reactive, service. “Smart customers” are driving demand for “smart water” solutions, such as advanced meter infrastructure, customer portals, and online, web-enabled services that work seamlessly on mobile devices.

Best Practices:

Customers cannot support what they cannot understand. Communications must be transparent and understandable. That includes water bills

Develop transparency and understanding through use of:

- An advanced meter infrastructure system
- Customer portals to access information they desire to manage their water consumption/ conservation
- Establish a Customer Relationship Strategy using elements such as:
    - Customer Relationship Management Systems (CRM)
    - Call Centre telephony systems that support multiple modes of communication
    - Integration or coordination with local 311 Systems
    - A Social Media Policy to engage, monitor and respond to customers in a timely fashion as recognition communication now occurs 24/7
- Ensure customer policies are equitable to different customer types and have effective customer escalation processes and dispute resolution

Key:

In order to deliver a high level of customer service, all departments must work together well, cooperate, and recognize serving the customers as a priority. Recognize that timeliness, as well as quality of the responses to customer issues, are important. Establish and monitor key performance metrics, such as average speed of answer, call duration, number of repeat calls/emails, and number of issues that are escalated.

Support and Resources:

AWWA/WEF Reports

AWWA G420 standard, Communication and Customer Relations

Value of Water Coalition
valueofwater.org

Guelph. Future Ready.

Speaking of making a start…The City of Guelph's Strategic Plan: Guelph. Future ready. reflects the aspirations of Council, staff and the community for a more sustainable future. A key focus of the Plan is to improve how the City communicates with residents and delivers services. To support this, the City has defined an enhanced, data-driven, customer service model that will incorporate the increased customer expectations and industry best practices in customer services including a greater presence and support for digital service delivery.

This staged implementation strategy will focus on the enhancement of key customer service deliverables such as:

- Consistency & Reliability
- End-to-end service
- Transparency, and
- Delivery in a timely manner

Halifax Water - Measuring Customer Service Performance

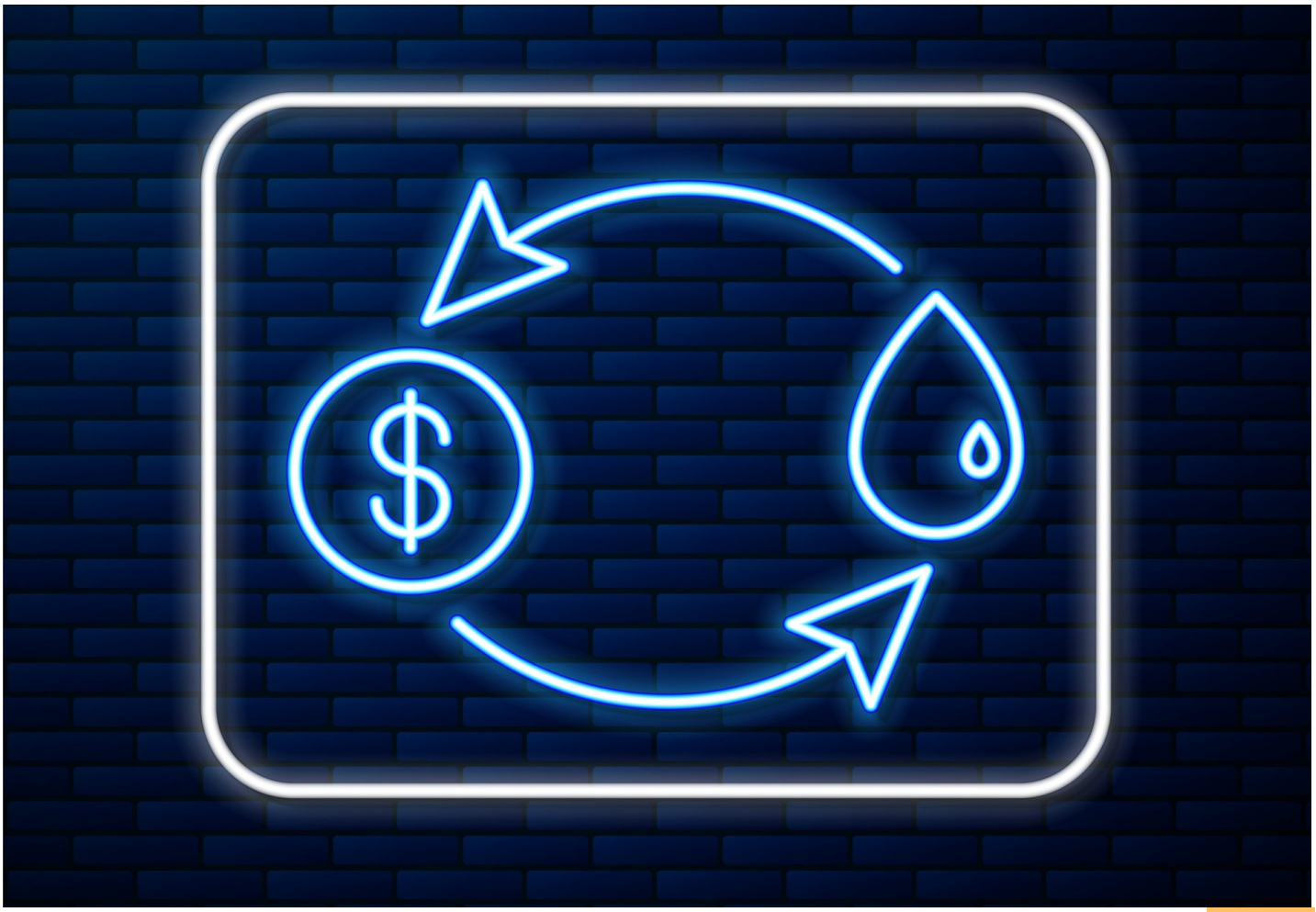
Halifax Water has also adopted a plan for sustainability that places customer service as a priority. To ensure attention to customers as a high priority, they have identified this as a measurable factor. Halifax Water employs a corporate-balanced scorecard wherein Service Excellence is set as a critical success factor. The four organizational indicators are:

- Customer satisfaction with service (measured annually by a third party survey)
- Water service outages (# of connection hours/1,000 customers)
- Wastewater service outages (# of connection hours/1,000 customers)
- Average speed of answer (% of calls answered within 20 seconds).

Part Two: Full Cost Recovery Framework

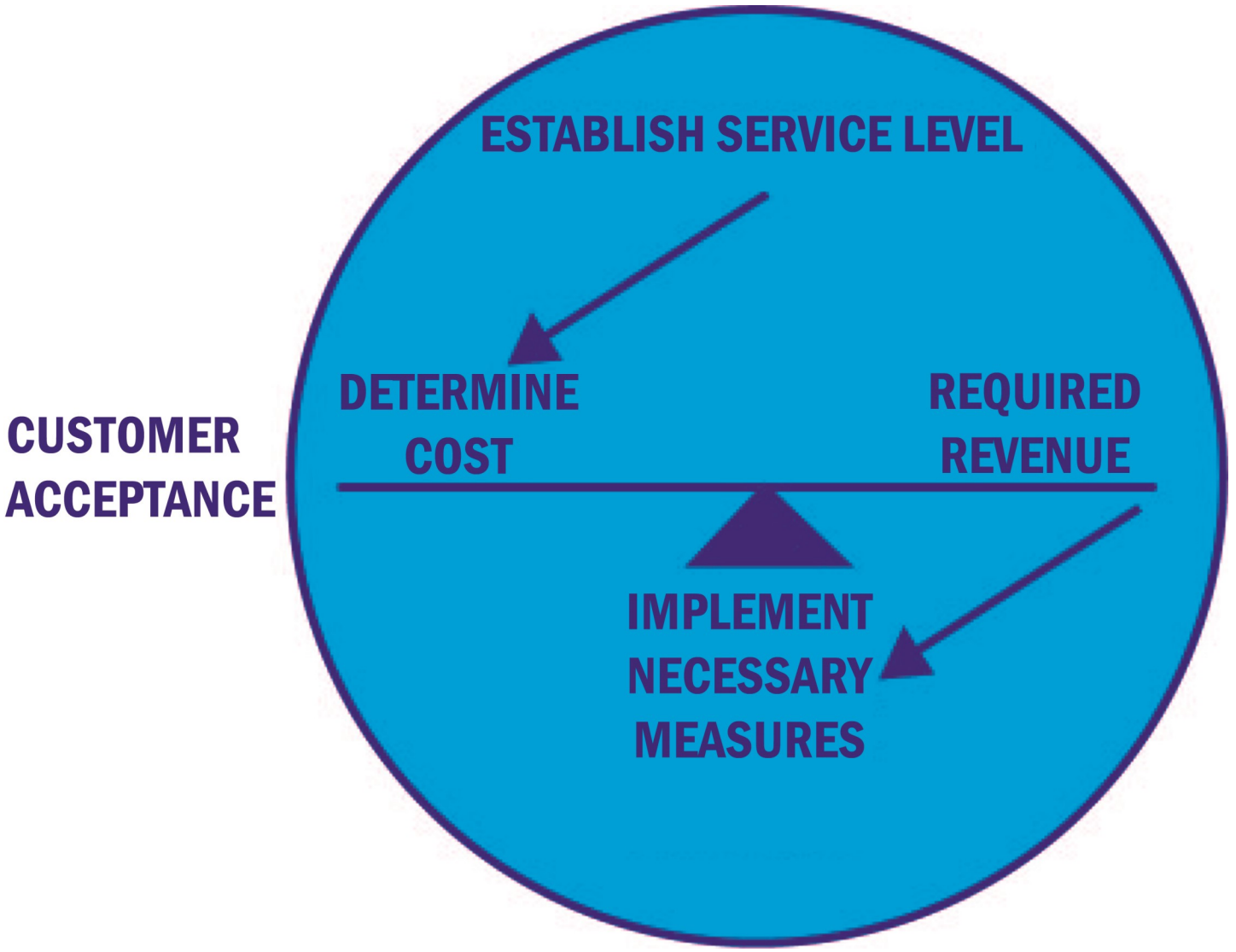
In Part One, we identified many challenges facing our sector. However, we cannot address all of a utility's operational, environmental, and social sustainability goals if it is not financially and fiscally sustainable. Most of these challenges can be addressed if sufficient funds can be effectively applied to each. In Part Two, we expand on that topic and focus on the recognized Best Practice of Full Cost Recovery as a framework for financial sustainability and planning.

What is Full Cost Recovery? It is the concept that the cost charged to the end users of water services reflects all the costs of providing those services. In essence, this means balancing a utility's total cost of providing the desired level of service with its revenue sources, in a long-term, sustainable manner. Each of these elements must be considered if this concept is to be successful.



Challenges in implementing a Full Cost Recovery framework include:

- Establishing desired service levels
- Determining accurately the costs required to provide those service levels
- Determining the utility's likely future revenue
- Gaining customer acceptance for implementation of the measures required



Establishing Service Levels

The level of service your utility provides will drive the costs incurred and, therefore, the revenue you will require. So, a fundamental step in establishing Full Cost Recovery is defining the level of service that you are obliged to deliver to your customers.

A minimal level of service could be regarded as: providing only those services, and at a level your utility is legally mandated to perform by a regulatory body.

A higher level of service could be seen as better services (e.g., less frequent or briefer interruptions of service) or providing additional services which are not legally required, but are desired by customers (e.g., providing drinking water trucks at community events). A higher level of service normally equates to higher costs, and thus, a need for increased revenue to be collected from your customers. Accordingly, the level of service, and the perceived associated value, must arise from open communication between your utility and your customers to ensure the correct balance of cost/ revenue and service level/value is obtained.

Determining Costs

An essential concept of Full Cost Recovery: one considers all costs. Some cost factors in providing sustainable water services are relatively easy to determine (e.g., staffing costs and energy bills). However, some are more difficult to predict or quantify. This is usually because they have not been considered in detail in the past (e.g., climate change impacts), or they involve factors for which cost models are relatively new or are not currently available (e.g., the benefit of natural assets in source water protection).

Utility costs can generally be placed into two categories:

1. **Operational costs**
   Comprise all costs associated with ongoing aspects of water treatment and supply, wastewater collection and treatment, and stormwater management including, for example: Staffing, maintenance, equipment, supplies such as chemicals, energy usage and shared services (human resources, finance, procurement, information technology, and fleet)

2. **Capital project costs**
   Comprise all costs associated with capital projects including studies, condition assessments, modelling, environmental assessments, permits, design, construction, contract administration, and post construction warranty.

In order to minimize operational and capital costs, and optimize the balance between them, a utility must have a sound, current and active asset management program.

Determining Revenue

As utilities, we can generally obtain funds from multiple revenue sources as well as financing. But typically, user fees account for about 80% of annual revenues collected by the average Canadian utility (from CWN's Balancing the Books - see the Support and Resources list). Other smaller contributing sources could be government grants, development charges, dedicated charges (like stormwater fees), or service charges (like connection fees).

Governance is also a significant factor in financing a utility. In many cases, utility rates are set by elected officials who have to weigh full cost recovery against affordability, economic development, service levels, and other factors. Under certain municipal governance structures for small and/or lower-tier municipalities, provincial regulations prescribe restrictive debt limits that may prevent municipalities from acquiring the capital needed to invest in new infrastructure.

Costs should be spread across multiple generations to provide a measure of intergenerational equity. Ideally, the costs to current and future generations of resource depletion and environmental impact should be included. However, these are more difficult to quantify and/or predict.

Gaining Public Acceptance

Full Cost Recovery tends to result in rate increases, even after the implementation of best practices. While the necessity of this may be unassailable to the engineer or accountant, in the end it is your utility's Board or your Council, and your customers, who need to be convinced of the value of the service and the associated necessity for rate increases. We expand on this topic in Part Three.

Implementation

Your Utility Financial Model must consider: current and future operational and capital budgets, as well as anticipated revenue and financial projections from Asset Management Plans. Ideally, the model should include a detailed 10-year capital plan and consider a long-range outlook of 20 years plus. It should also examine scenarios in which revenues are less than currently anticipated so that the impacts to, and robustness of, your utility's Model can be evaluated. Such a system must be dynamic, requiring monitoring and adjustment as necessary at regular intervals.

Implementing a Full Cost Recovery Approach: Not a "once and done"

The City of Regina's rate-setting policy (almost 25 years old!), sets out an objective of Full Cost Recovery for their Utility. The policy provides a solid underpinning for decision making. But implementing the policy requires persistence and continual improvement.

1. *Start with what is available.* -- The City of Regina started with a financial model primarily used to project future reserve levels and consider options for rates and debt.
2. *Enhance existing tools.* Over time, the model was improved to include more complex scenario planning, allowing Council to have a more complete picture of the impact of their choices around rates, debt, and capital and operating plans.
3. *Engage external resources as appropriate.* Regina needed a tool to better plan its capital investments. Instead of building a tool, the City engaged a consultant to implement a new process and multi-criteria prioritization tool starting in 2010. Using an external resource jumped them forward. It allowed Regina to benefit from other cities' learning.
4. *Invest in culture change.* The success of Regina's Utility Model and capital investment planning tool rests on a collaborative and inclusive approach. That approach required commitment from leadership to ensure staff across the organization participated and took ownership of the process.
5. *Communication with decision makers.* Staff have been consistent in providing information through the lens of the Utility Model. As its reliability improved and supporting enhancements (like the CIP process) were implemented, increasingly better information was able to be provided to decision makers.

Support & Resources

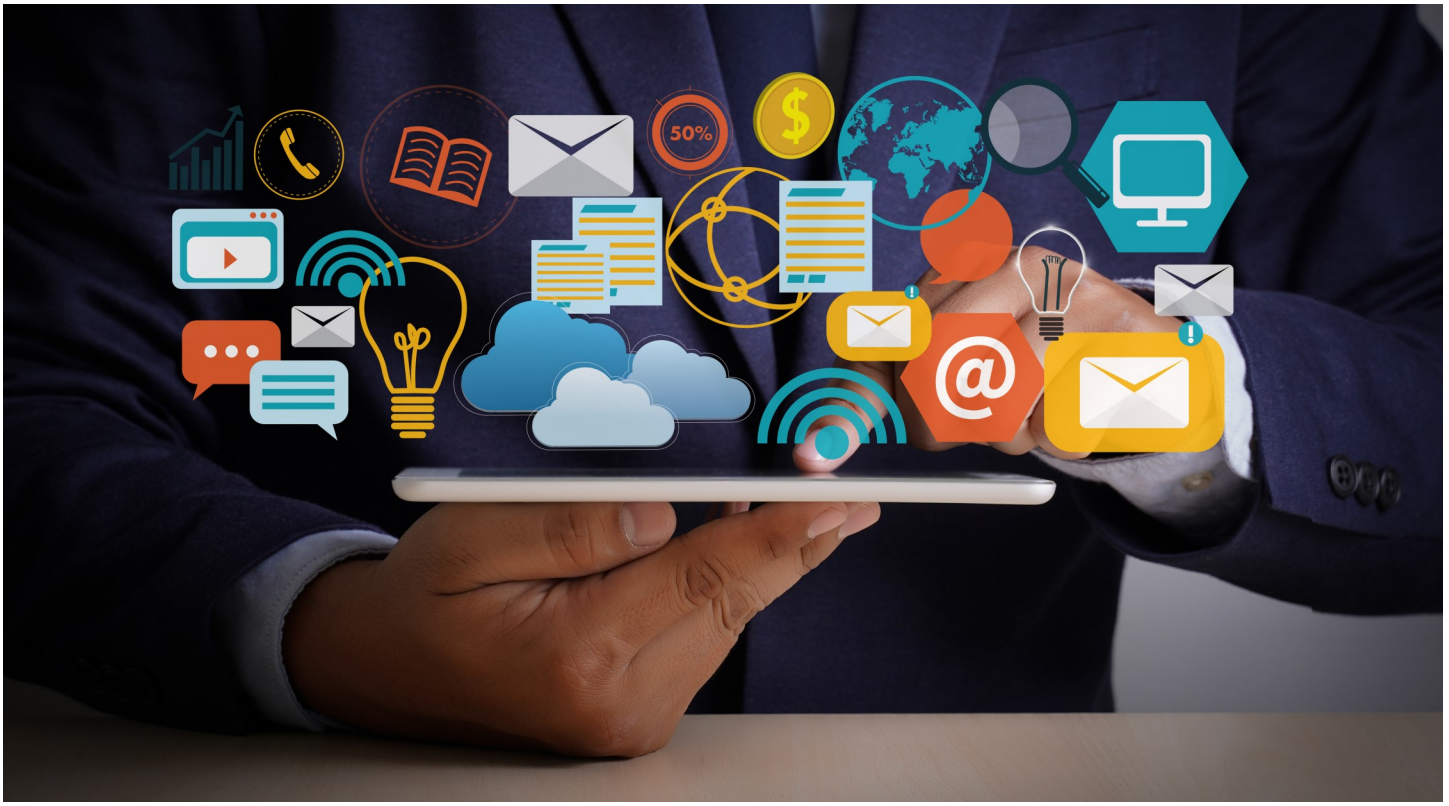
- National Water & Wastewater Benchmarking Initiative
  https://www.nationalbenchmarking.ca/
- Balancing the Books; Financial Sustainability for Canadian Water Systems, Canadian Water Network, March 2018
  http://cwn-rce.ca/report/balancing-the-books-financial-sustainability-for-canadian-water-systems/
- Only the Pipes should be Hidden: Best practices for pricing and improving municipal water and wastewater services, Canada's Ecofiscal Commission, September 2017
  https://ecofiscal.ca/reports/pipes-hidden-best-practices-pricing-improving-municipal-water-wastewater-services/
- Building Better Water Rates for an Uncertain World, Alliance for Water Efficiency, August 2014
  https://www.financingsustainablewater.org/tools/building-better-water-rates-uncertain-world
- AWWA – Financial Management for Water Utilities: Principles of Finance, Accounting and Management Controls

Part Three: Communicating with the Public, Elected Officials & Other Stakeholders

Communications strategies play a crucial role for utilities and the ability to deliver appropriate rate changes to support operational needs. A strategy should be proactive, consider diverse stakeholders, use multiple communication channels, and address customer barriers/concerns identified in public engagement and internal discussion. Without customer understanding and acceptance of rate change, as utilities, we are constrained in our ability to obtain rate application approval needed to operate efficiently and effectively.

A strategy should focus on:

- Ensuring customers understand and accept that rate changes are required to maintain and improve vital infrastructure systems critical to everyday life
- Furthering customers' understanding that future rate changes support growth and innovation of water and wastewater systems



For a strategy to succeed it should:

- Identify the main customer barriers and gaps
- Define objectives and outcomes
- Confirm who are the stakeholders and communicate with them
- Identify key messages
- Examine best approaches to deliver the messages.
- Establishing desired service levels
- Determining accurately the costs required to provide those service levels
- Determining the utility's likely future revenue
- Gaining customer acceptance for implementation of the measures required

Identifying Customer Barriers and Gaps, and Establishing Objectives

Your strategy must convey how the services provided through utility rates ultimately benefit your customers. It should also constantly reinforce the requirement of your utility to provide a continuous supply of safe water and wastewater services to residential, commercial and institutional customers.

Your utility should gather information regarding customer barriers to acceptance. This includes information about customer priorities, such as: Concern about rates; value of water quality; source water protection; flood mitigation and protection; in addition to water conservation. As well, your utility's priorities need to be factored into the strategy, for example: Your utility's strategic plans; the value of water; sharing information regarding infrastructure; service and policy developments impacting the public; and sharing operational and financial information in the spirit of transparency.

Ultimately, your utility needs to establish communications and engagement objectives which align and deliver a business objective - in this case, the delivery of a successful rate change with limited public objections.

Confirm Stakeholders and Communicate with Them

Identifying your stakeholders is an important first step in developing a strategy. Once they are identified, specific engagement plans and messages can be determined. Although utilities are fairly similar, you may have differing stakeholder groups. Some stakeholders for you to consider include your: Mayor and Council; Utility Board; Shareholders; Customers; Emergency Services; and the Media.

An important audience who typically demonstrate resistance to rate increases are elected officials. Generally, they reflect the tone of constituents who do not understand the regulatory process and have little knowledge as to why rate increases are required to maintain critical services. Ensuring political leaders are armed with education and messaging on rate applications, along with a core understanding of the requirements of the water and wastewater systems, will help build supporters.

A robust communications strategy, supported by information and evidence-based documentation that focuses on issues important to customers, can go a long way to developing a supportive position from political leaders. By creating advocates in this group, they become educators of the public and help to mitigate customer objections and complaints. This support is vital for moving forward with the public and other stakeholders.

While engaging political leaders is vital, all audiences must be factored into the strategy. Each audience group likely has at least one area of interest which could be adversely affected if your utility struggles to maintain the level of service needed to comply with legislative requirements or to meet demand and quality requirements. These potential negative impacts should be explained to the respective stakeholder groups.

Part Three: Communicating with the Public, Elected Officials & Other Stakeholders

Key Messages

In any strategy, it is essential to ensure consistency in messaging. Key messages should be targeted to the priorities of each audience group. Messages can be grouped by topic, type or by audience. They may need to be expanded or modified based on feedback from audiences.

Examples of key messages include:

- Clean water is critical to the health and well-being of every member of society
- It is essential to have a safe and reliable water system
- Through rates, utilities ensure the water system can be expanded and maintained to serve the needs of our community
- Through treatment of our wastewater, we minimize impacts on our environment
- Water conservation has economic, social and environmental benefits.

Your overall strategy should factor in both the customer and your utility's priorities with consideration given to simple and direct messages for each audience. Messages should help resolve a problem or question in the mind of a stakeholder- ideally before the question is raised. To accomplish this task, it is always important to frame messages from the perspective of the stakeholder, not the utility.

Media Relations

Effective media relations play an important part in communicating to the public when rate changes are required. A proactive media strategy can defuse questions and concerns likely to be raised by stakeholders during a regulatory process. Additionally, a proactive media strategy can offset potential marketing costs through 'earned' media creating third party content that can be reused through social media.

Any proactive media strategy should consider the external climate (e.g., recent municipal tax increases) and other utility or local controversies which may be current and which could weaken the planned message. The media can help to advance a strategy, but they can also be harmful if messaging is unclear or contradictory.

It is also critical to ensure communication strategies are executed well in advance of any rate application. They should be focused on educating customers as to why a change in rates is required and how this provides benefits for the end user. Initiating a media relations plan just before a rate increase is proposed is too late.

Support & Resources

- AWWA Public Communications Toolkit - Public Communications Toolkit | American Water Works Association (awwa.org)
- WEF/AWWA Utility Management Conference – Identifying Attitudes, Actions, Beliefs and Values that Drive Customer Communications Access Water | Identifying the Attitudes, Actions, Beliefs and Values That Drive Customer...
- The Value of Water campaign http://thevalueofwater.org/
- CWWA Public Attitudes 2015 – CWWA_2015_Public-Attitudes-Project_WEB.pdf

Part Four: Moving Forward

The intention of this Guidance Document is to assist you, as water leaders, in moving your utilities towards long term sustainability. It contains only a brief review of the challenges we face and some factors which should be considered in your plans for achieving sustainable water services. To help you, we have identified a number of current resources in each Part thus far.

This Part Four identifies a few recurring points we've tried to make. Then we turn the focus toward potential next steps, for both individuals and the industry, recommending a few topics that could use some further research and guidance.

Assessing Your Progress

One common message from our contributors was "just get started!" You have likely begun work on a number of these issues. But where do you stand overall? We suggest you start with a realistic evaluation of what you have tackled so far, and which priorities need attention going forward. To help you, we have created a Utility Self-Assessment Tool as the last page of this guidance document. Start with this checklist to make your action plans for your next steps to advance even further.

Support & Resources

Another key message is that there is already a lot of existing research, case studies and review on most of these subjects. A tremendous online library of resources from respected organizations. Here are four high-level resource sites:

- The Canadian Infrastructure Benchmarking Initiative, https://www.nationalbenchmarking.ca/
- Effective Utility Management – a coalition of several organizations https://www.watereum.org/
- Asset Management BC - AssetSMART 2.0, a community self-assessment tool https://www.assetmanagementbc.ca
- PEMAC Asset Management Association of Canada, www.pemac.org

Areas for Further Development by Our Industry

In developing this Guidance Document, we noted a few areas that we felt were not fully developed or reported on yet. For example, a number of factors that must be included in a Full Cost Recovery Plan have only begun to be examined and quantitatively evaluated. Although we have referred to these issues previously, the five areas we see as priorities for further development are:

- Affordability
- Impacts of Climate Change
- Workforce Development
- Value of Natural Infrastructure to Water Systems
- Communicating the Value of Water

Affordability

While we have presented each of the challenges separately, we know that they are all interrelated. Water service costs will likely rise to implement many of the factors identified in ensuring a utility is sustainable. The impact of that on lower income households can be a contentious and divisive issue if it is not recognized and proactively addressed.

Where does the responsibility lie? With the utility, with the municipality or with provincial agencies? Strengthening customer relationships and communicating with stakeholders will be key to addressing affordability concerns.

To date, most of the research on the issue of affordability has been carried out in the United States and reflects the particular concerns and factors there. We have noted the joint Report of AWWA/ WEF/NACWA and the Conference of Mayors. It is recommended that directed research be carried out to specifically examine affordability considerations in Canadian communities.

Impacts of Climate Change

As outlined in the Challenges section (Part One), the impacts of climate change are increasingly apparent through extreme weather events, droughts and/or effects on water quality. For many communities, these impacts are being seen sooner and with more intensity than predicted.

The challenge for a utility is to prepare for such changes and ensure you can continue to provide sustainable water services. A risk-based approach, reflecting the uncertainties of current predictions and the corresponding range of potential impacts, is the best means to deal with the range of possible climate outcomes. Both traditional infrastructure approaches and new, innovative techniques can be evaluated to assess their applicability and usefulness in making a water utility more resilient to climate change impacts.

Opportunities exist to evaluate potential approaches and measures in Canada and around the world, and thus the resiliency of water and wastewater systems. Recently, CWWA contributed to a report highlighting five Canadian utilities that are collecting and utilizing data to support infrastructure vulnerability assessment and increase resilience to climate change.

Using Better Data to Identify Climate Change-Related Infrastructure Vulnerabilities in Canadian Communities (PSD, CWN, RCM & CWWA) Using Better Data to Identify Climate Change-Related Infrastructure Vulnerabilities in Canadian Communities – Canadian Water Network (cwn-rce.ca)

Workforce Development

We noted in the Challenges (Part One) that the workforce in water utilities across Canada is aging. Many senior employees are becoming eligible for retirement. Without proactive measures to replace them, as well as processes to transfer the institutional knowledge they hold, utilities will experience significant operational and financial difficulties. Policies and programs to replace skilled workers take a substantial time to develop and longer to implement. It can take several years for even the basic training of an operator, and decades for senior personnel. Therefore, as a sustainable utility, you need a clear plan on how to deal with these changes in your workforce.

CWWA's Utility Leadership Committee has selected this topic for further investigation. We are collecting and reviewing policies and programs (either currently being implemented or under consideration by utilities) that would assist in selecting the most appropriate measures for the particular circumstances.

The Value of Natural Infrastructure to Water Systems

While the beneficial effects of natural infrastructure to communities might have always been appreciated, only now are we recognizing the need to quantify its value in some form so that the benefits can be fully considered in decision making. Earlier, in discussing the source water protection challenge, we noted how natural infrastructure can assist in that aspect of providing water services. Other examples, such as using wetlands to improve water quality, can also be demonstrated. If these valuable benefits cannot be provided by natural infrastructure, then they must be provided by other means. This will likely increase expenditures and increase costs to customers - as well as having a greater impact on the environment. Other "non-water utility" benefits, such as access to nature by communities, will also be lost.

The Canadian government has recognized that natural infrastructure has an important role in water supply, water quality and stormwater management and they are in the earliest stages of creating a new Canada Water Agency. We support federal efforts to establish policies and programs to recognize and promote such natural infrastructure projects. It is recommended that utility leaders, through the CWWA, work with the federal and provincial governments, and other stakeholders, to provide input and expertise during the development of such policies.

Communicating the Value of Water

We don't think we can overstate the importance of good communications with all of your stakeholders. Moving your utility towards a truly sustainable model may require investment…and such investment requires the support of these stakeholders.

While incorporating factors described in this Guidance Document will likely increase the costs of providing water services, these are critical, necessary investments. Increasing the cost of providing any service is never popular with customers, nor welcomed by elected officials. But if we work with key stakeholder groups, they can come to understand the value of providing a safe and reliable service to the community.

Customers need to understand the value of the service they are receiving and appreciate all the costs involved. An example of an effort to communicate and promote an appreciation of costs are the Value of Water campaigns. Excellent communication materials have been developed to facilitate individual utility campaigns. But these have largely been developed for use in the United States.

Given our federal/provincial system, and the different constraints to which Canadian utilities are subject, those American resources are not always suitable for use in Canada. Accordingly, it is recommended that communication materials be developed and shared that are tailored to ensure effective use by Canadian utilities. Those materials can leverage and build upon the American work, but would reflect the particular needs of Canadian utilities with respect to governance, legislation & regulations, federal/provincial/municipal responsibilities, and stakeholder groups.

A Living Document

This Guidance Document was intended as a way by which CWWA can assist you, our membership, in your journeys "Towards a Sustainable Utility". We have merely identified some of the challenges, noted some examples from others, and pointed you in the direction to find more information on each topic. We then suggest where we, as an industry, need to look next for further research and or reports to support our efforts.

As new, relevant reports emerge, we will add them to this Guidance Document. And of course, these links change and newer reports become available all the time, so we will endeavor to keep this document current. If you have suggestions, do not hesitate to send them our way to our "Resource Suggestion Box" at https://cwwa.ca/?page_id=3339&et_fb=1&PageSpeed=off

Note: In support of this Guidance Document, CWWA ran a series of webinars on this theme of Towards a Sustainable Utility with each session discussing a different aspect of utility sustainability. We released those webinars in conjunction with this guidance.
They can be viewed at: cwwa.ca

Additional Support and Resources

Federation of Canadian Municipalities (FCM) - guidance and funding:
https://fcm.ca/en/resources/mamp/asset-management-resources

Canadian Network of Asset Managers (CNAM) – professional association
https://www.cnam.ca/

Public Sector Digest – Canadian professional publication and database library
https://www.publicsectordigest.com/

Canada's Ecofiscal Commission https://ecofiscal.ca/reports/

Canadian Water Network https://cwn-rce.ca/
http://cwn-rce.ca/report/balancing-the-books-financial-sustainability-for-canadian-water-systems/

Canadian Water Resources Association https://cwra.org/en/

Canadian Infrastructure Report Card http://canadianinfrastructure.ca/

Quality Urban Energy Systems of Tomorrow (QUEST) https://questcanada.org/

Alliance for Water Efficiency (AWE) https://www.allianceforwaterefficiency.org/

American Water Works Association (AWWA) https://www.awwa.org/

Utility Self-Assessment Tool

Date(s): _____

	Your Current Status			
Sustainable Utility Measure	No strategy or plan is in place	Components of a strategy or framework are in place, but there are significant gaps	A strategy / framework is in place that identifies specific goals and the approach to achieving them, but has not been fully implemented	A strategy / framework is in place and has been implemented that identifies specific goals and the approach to achieving them
Asset Management Program				
Workforce demographics				
Climate Change				
Source water or receiving water plan				
Energy management				
Declining consumption strategy				
Affordability strategy				
Customer expectations				
Financing (Full cost recovery?)				
Communication strategy				