WATER DEMAND MANAGEMENT STRATEGY

2025 UPDATE
CITY OF VANCOUVER

CITY OF VANCOUVER

Engineering Services

Acknowledgements

Water in its various forms plays a central role in the physical, cultural, spiritual, social, environmental, and economic well-being of Indigenous Peoples. Locally, water shapes a major role in the teachings, lives and cultural practices of the xʷməθkʷəy̓əm (Musqueam Indian Band), Sḵwx̱wú7mesh Úxwumixw (Squamish Nation), and səlilwətaɬ (Tsleil-Waututh Nation).

We acknowledge with respect and gratitude that this report was produced on the unceded traditional territories of the xʷməθkʷəy̓əm, Sḵwx̱wú7mesh Úxwumixw, and səlilwətaɬ who have existed and stewarded these lands and water resources since time immemorial.

We are grateful to live and work on these lands and acknowledge the responsibility that we must ensure the land and water is cared for respectfully to ensure prosperity for future generations.

Metro Vancouver Regional Watershed (Source: DWDM Team Images)

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Single Detached Home with Water Meter (Source: DWDM Team Images)

Executive Summary

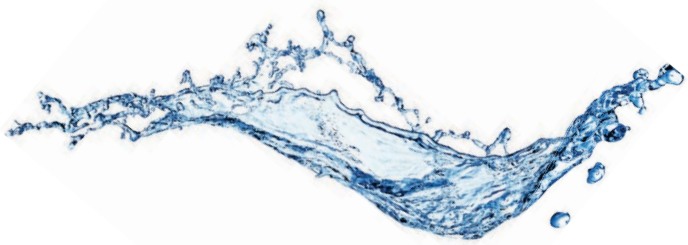
The Water Demand Management Strategy (WDMS) is a critical initiative aimed at ensuring the long-term sustainability, resilience, and equity of Vancouver's water systems. Building upon over a decade of progress, the WDMS outlines a comprehensive approach to reduce per capita water use by 15 per cent by 2030 and transition to a fully metered water utility by 2040.

The strategy addresses mounting challenges such as population growth, the impacts of climate change, and the need for financial sustainability. Investments outlined in the WDMS support the adoption of Advanced Metering Infrastructure (AMI), the acceleration of residential metering, applying an incentivized water rate structure, and the implementation of targeted policies to enhance water efficiency. Approximately 43 per cent of water consumption in Vancouver remains unmetered (2025), with 68,000 single-detached homes still relying on flat rate billing. Accelerating metering coverage is central to achieving equitable cost recovery, reducing water consumption and loss to leakage, and stabilizing bulk water purchases so that Vancouver can continue to support growth while maintaining resiliency of our water resources.

Investments through the 2019–2022 and 2023–2026 Capital Plans, totaling $31 million, have laid the groundwork for these initiatives. Key accomplishments include the completion of feasibility studies, the development of the WDMS, and the procurement of metering projects, with an additional 6,000 residential meters scheduled for installation by 2026. Moving forward, continued capital investments will be required to meet fully metered targets by 2040 and improve current pace of metering through redevelopment.

The WDMS also supports broader climate adaptation efforts, including addressing the growing risk of drought. The integration of alternative water sources, policy updates to encourage non-potable water use, and measures to reduce reliance on potable water for non-essential uses further reinforce the City's commitment to sustainability.

By aligning its water management goals with long-term planning, strategic investments, and community equity, Vancouver is positioning itself as a leader in sustainable water management. The WDMS represents a vital step toward creating a resilient and adaptive water system that ensures fair access and efficient resource use for generations to come.



Section 1: Introduction and Background

1.1 Vancouver's Water Supply

The City of Vancouver has a long-standing commitment to water conservation and demand management, recognizing drinking water as a vital resource and human right. Water delivered to Vancouver's taps originates as rainfall and snowmelt captured in the Capilano, Seymour, and Coquitlam reservoirs in the mountains to the north and northeast of Vancouver (Figure 1). To protect drinking water quality, the three watersheds are closed to public access. No recreational, agricultural, or industrial activities that may contaminate the water are permitted inside watershed boundaries.

Source water from the reservoirs is treated in two drinking water treatment plants operated by Metro Vancouver (the Seymour-Capilano Filtration Plant and the Coquitlam Water Treatment Plant) and then treated drinking water is delivered to municipalities across the region. The water is carried in large pipes, propelled by gravity, to the City's local drinking water distribution system, which brings drinking water to the taps of residents and businesses and provides water to hydrants for fire protection.

The City's drinking water distribution system—developed over the last 130 years and valued at $3.5 billion—delivers approximately $100 million (2024) worth of bulk-purchased water to customers annually. Vancouver's Drinking Water Utility monitors drinking water quality, maintains infrastructure, regulates the efficient use of drinking water, manages water system resiliency for emergencies and plans for a sustainable and equitable supply for future generations.

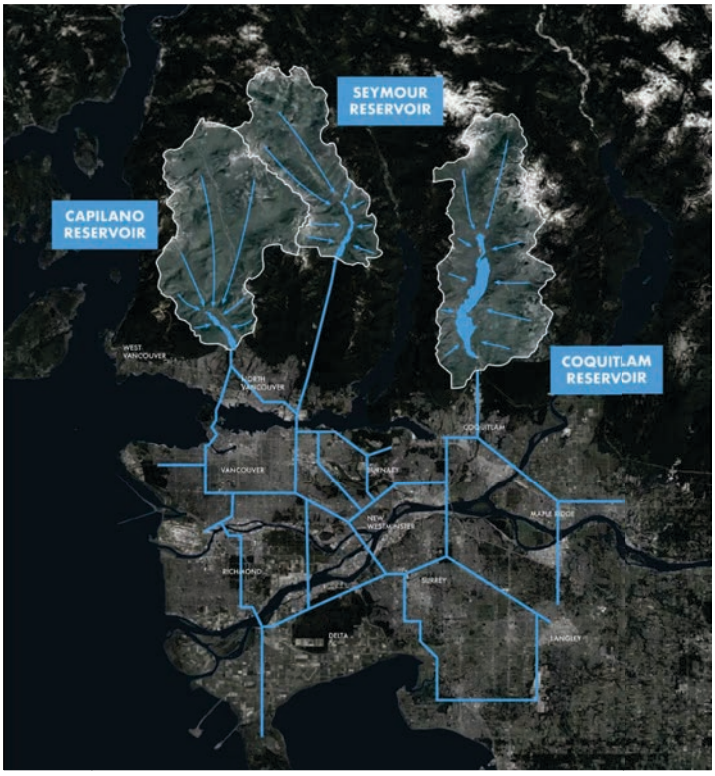


Figure 1: Metro Vancouver Water Supply Area (Source: metrovancouver.org).

1.2 A History of Leadership in Water Conservation

Vancouver is recognized as a regional leader in water demand management. Sustainable drinking water use is supported by over a decade of Council-approved plans, policies, and by-laws aimed at reducing per capita water use and enhancing system sustainability and reliability. As detailed in Table 1, policies and programs such as the 2011–2020 Greenest City Action Plan (GCAP) set water use reduction targets and initiatives that contributed to a 24 per cent decrease in liters per capita per day[1] water consumption from 2006 to 2020.

Since the completion of GCAP in 2020, additional conservation initiatives contributed to further reductions in per capita consumption. One of the most significant policy and bylaw changes relate to Metro Vancouver's Drinking Water Conservation Plan and enforcement of Vancouver's Drinking Water Conservation By-law. In 2020, seasonal water restrictions reduced from three days per week to two days per week and were then again reduced in 2022 to only one day per week. This effectively limited allowable summer lawn watering times by over 70 per cent.

Vancouver has one of the most robust water conservation education and enforcement programs in the Metro region. By consistently educating residents and enforcing the Drinking Water Conservation By-law, Vancouver has lowered seasonal water use increases compared to other jurisdictions in the region. Over the past decade, a 50 per cent increase in water use across Metro Vancouver in the summer has been typical; in more recent years, summer water use averages have further increased to 55 per cent compared to winter use. Vancouver averages a 35 percent increase in summer compared with winter demand—20 per cent less than regional averages—attributed to outreach, education, and enforcement including tickets for violations (Figure 2).

Capilano Supply Area (Source: metrovancouver.org)

[1] Litres per capita per day (L/c/day) is a commonly used metric in water resource management and urban planning. For Vancouver it represents the total water purchased from Metro Vancouver, divided by the city's population, divided by number of days per year to provide a standardized way to measure and compare per-person water use across time periods.

Table 1: Council Approved Actions Supporting Water Reduction

December, 2011	2011-2014 Greenest City Clean Water Work Plan	By-law revisions requiring residential water metering for all new single detached houses and duplex properties.
December, 2011	Rate Update	Implementation of seasonal volumetric rate for commercial and residential metered customer (low and high season).
November, 2012	Rate Update	Establishment of a peak and off-peak seasonal rate structure for all metered properties.
November, 2015	Greenest City Action Plan	Clean Water goal #6: Reduce per capita water consumption by 33% from 2006 levels.
April, 2017	Greenest City Action Plan	By-law amendments to expand the prohibition of non-recirculating uses of drinking water.
December, 2019	Rate Update	Alignment of peak season and off-peak season water rates to match the water restriction periods set out in the Drinking Water Conservation By-law.
January, 2020	Greenest City Action Plan	Amendments to Waterworks By-law to prohibit the use of Once Through Cooling appliances.
November, 2020	Climate Emergency Action Plan (CEAP)	A five-year action plan aimed at cutting carbon pollution by 50 per cent by 2050.
December, 2020	GreenOps Plan 2.0	10% water consumption reduction target in civic facilities; accelerated civic facility water metering; and internal user-pay billing structure.

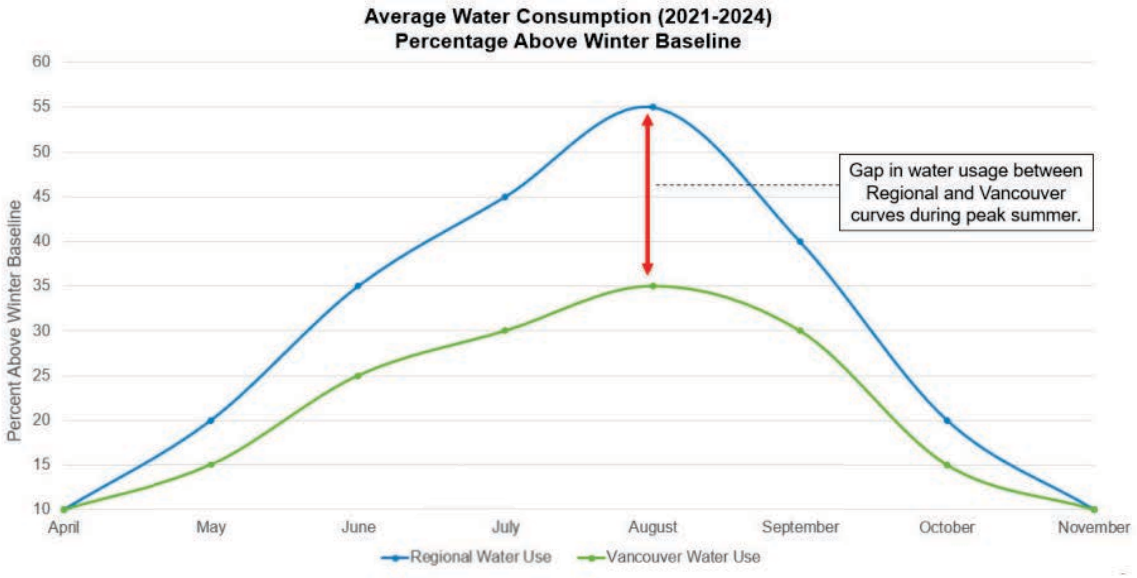


Figure 2: Seasonal Water Use Trends in Vancouver versus Metro Vancouver Regional Averages (Source: metrovancouver.org).

Section 2: Drivers for Water Demand Management

While Vancouver benefits from high-quality and historically abundant water supply, increasing regional demand, driven by population growth, densification, and climate change, is placing greater pressure on existing water resources. Drinking water doesn't simply fall from the sky; operating a water system requires significant investment towards treatment, conveyance, capital investment, maintenance, and system upgrades.

Vancouver's water consumption remains higher than North American averages, with residential consumption estimated at 244 L/c/day in 2024[2], comparable to San Francisco and Seattle who report residential water use of 161 L/c/day and 141 L/c/day, respectively[3]. With the city's population projected to grow significantly in the coming decades, overall demand will continue to rise, and climate change is expected to further impact drinking water availability by intensifying seasonal imbalances. Without proactive demand management, Metro Vancouver could face supply constraints, higher water costs, and increased effects of seasonal drought conditions. By using less drinking water for daily activities, the City of Vancouver can reduce water demand and reduce financial impacts to residents.

2.1 Climate Impacts

The City of Vancouver recognized the urgency of climate change and declared a climate emergency in 2019, joining thousands of cities worldwide. Metro Vancouver's weather means peak summer drinking water demand is misaligned with seasonal rainfall and snow patterns that replenish reservoirs in the winter. Climate projections indicate Vancouver will experience warmer, wetter winters and hotter, drier summers, leading to reduced winter snowfall, diminished snowpack, and more extreme rain events. These changes will limit the amount of water that can be stored for drinking purposes. At the same time, hotter summers will increase water demand, further straining supply when reservoirs are least able to recharge.

2.2 Population Growth

Vancouver's population of approximately 745,000 residents (2024) is expected to grow to 920,000 by 2050, while Metro Vancouver's overall population is projected to reach 3.6 million[4]. Vancouver's growth follows a compact development model, promoting infrastructure efficiency and lower per capita water use. However, rising population levels are expected to increase overall drinking water demand, outpacing reductions from traditional water conservation efforts.

The combined pressures of climate change and population growth will strain existing water supplies. According to Metro Vancouver's Water Supply Outlook 2120, additional water storage will likely be required by the mid-to-late 2030s to avoid seasonal water shortages. In response, Metro Vancouver is planning Phase 1 of Coquitlam Lake Water Supply Project[5], a $4 billion investment (2024 dollars) that will expand treatment capacity and double the volume of water available for drinking water use at the Coquitlam reservoir.

[2] Residential L/c/day represents the amount of water attributed only to residential water use, divided by number of residents, divided by number of days per year. It is an estimate in Vancouver as residential water services are not fully metered.

[3] San Francisco Water Utility and Seattle Public Utility residential water use reports.

[4] Metro Vancouver Water Supply Outlook 2120.

[5] Coquitlam Lake Water Supply Project.

As the most populus Metro Vancouver member municipality, Vancouver currently purchases 26 per cent of the region's drinking water[6] making it the single largest contributor to regional water system funding. Metro Vancouver emphasizes that conservation and demand management will be critical in determining the timing and scale of future infrastructure investments. Sustained reductions in Vancouver's water demand can help defer costly system expansions, reduce the city's share of regional water costs and support new water demand as the city implements municipal housing targets.

2.3 Billing Equity and Cost Recovery

With climate change and population growth placing increasing pressure on regional water resources, ensuring affordability of drinking water depends on maximizing the efficiency and sustainable use of existing supplies before expanding to new sources. Metro Vancouver municipalities remain one of the few major North American urban centers without universal water metering[7]. Without a fully metered utility, it is challenging to equitably distribute costs to all customers and is difficult to estimate the amount of non-revenue water that is lost to system leakage. Additionally, unmetered customers have little financial incentive to reduce their water use, as flat rates allocate costs to each unmetered customers equally, regardless of individual consumption.

Figure 3 illustrates a clear trend: cities with universal residential metering and conservation-based water rates have a significantly lower residential water use per capita. By transitioning to a fully metered system with rates that encourage conservation, Vancouver can reduce overall water demand, improve billing fairness, and help defer costly future infrastructure expansions—ultimately strengthening the region's long-term water system resilience.

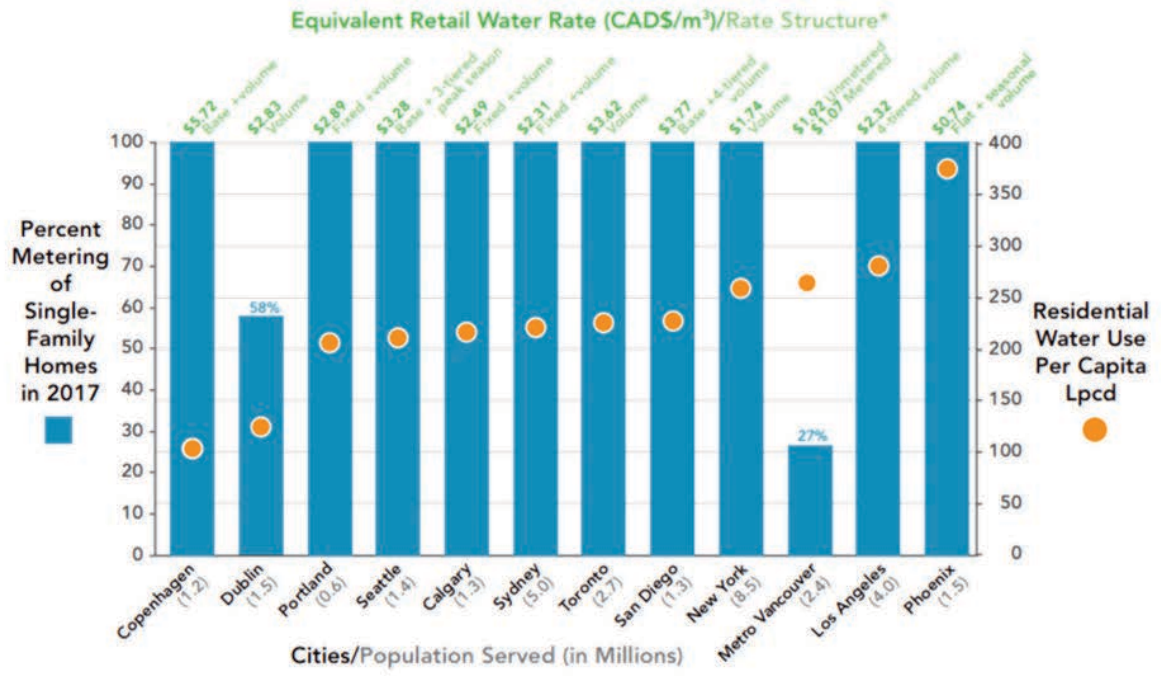


Figure 3: Comparison of the level of residential single-family metering, residential water use per capita, and average water rates for select cities from around the world (Source: Metro Vancouver).

[6] Metro Vancouver Water Consumption Statistics Report 2023.
[7] Residential Water Metering in Metro Vancouver Best Practices Guide.

Water consumption has been steadily declining in Vancouver since 2012 because of metering, conservation programs, and seasonal water restrictions. However, as Figure 4 highlights, bulk water purchase costs continue to rise due to water rate increases from Metro Vancouver, which emphasizes the need for further water demand management. Even with reductions in consumption, the cost of bulk water will continue to increase, and discretionary water use combined with unaddressed system leaks contribute to unnecessary water wastage and operating costs. When considered in parallel with a rising population, the city will be challenged to continue to decrease—or even stabilize—bulk water purchase into the future.

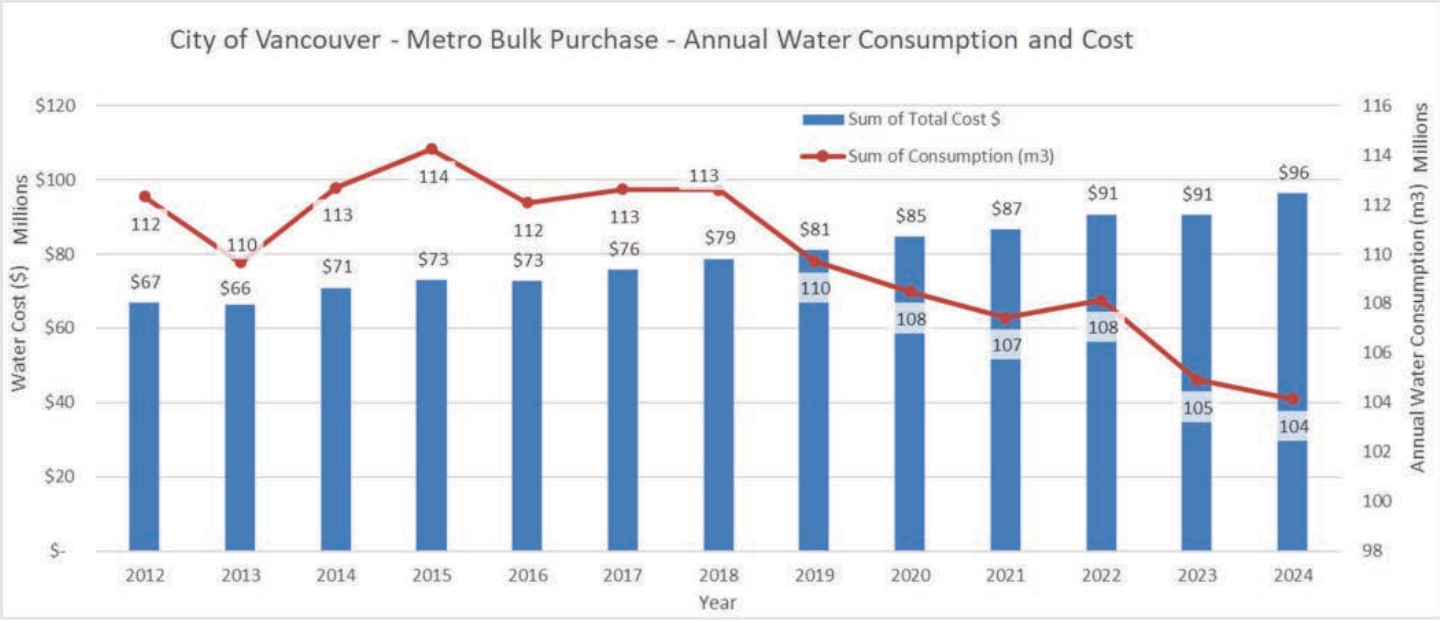
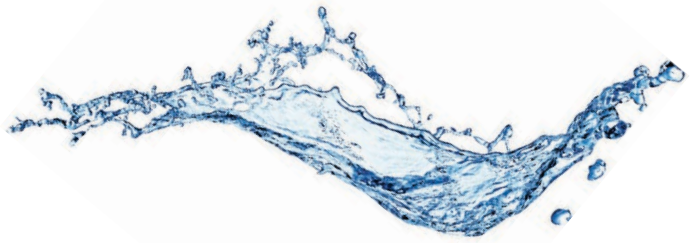


Figure 4: Rising cost of bulk water purchase despite Vancouver's decreasing consumption.



Section 3: Water Demand Management Strategy

3.1 Strategy Development

Building on previous successes in water conservation, the Water Demand Management Strategy (WDMS) was developed in 2020 to drive further water use reductions over the next decade and beyond. Recognizing the compounding impacts of aging infrastructure, population growth, and climate change, the WDMS outlines a multi-year operational and investment plan to achieve a 15 per cent reduction in per capita drinking water use by 2030, compared to a 2019 baseline, and identifies actions necessary to achieve a fully metered water utility by 2040.

The WDMS creates a foundation of best management practices through the following actions:

- Upgrading water meter reading technology to Advanced Metering Infrastructure (AMI),
- Expanding water meter coverage,
- Developing an equitable water rate structure that encourages demand management and sustainable cost recovery, and
- Implementing policies to reduce potable water use and increase non-potable use in a variety of scenarios.

As shown in Figure 5, these components, independently considered drinking water management best practices, provide maximum benefits when integrated together to create a robust foundation for drinking water stewardship. The resulting water conservation, along with use of non-potable water sources to offset drinking water demand, will contribute to long-term water resource system resiliency.

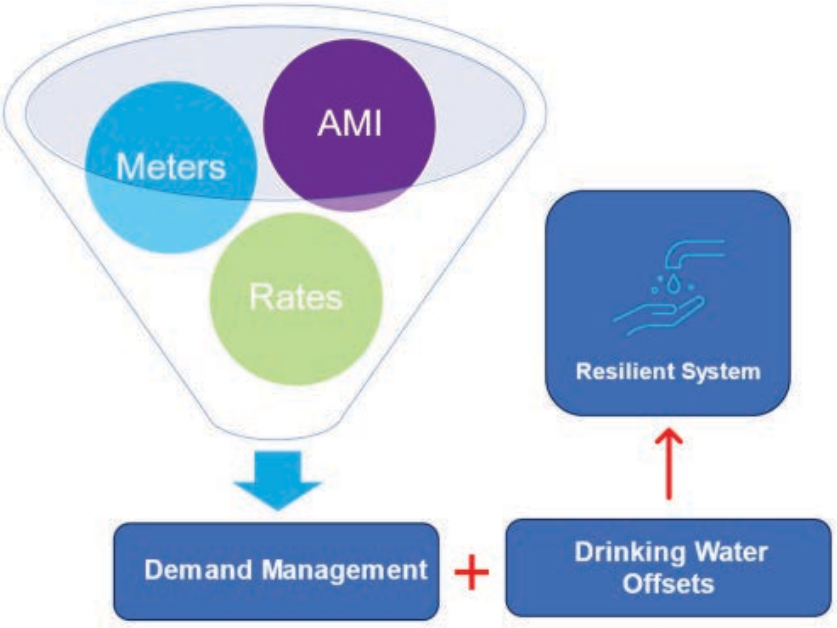


Figure 5: Water Demand Management Strategy Overview.

3.2 Advanced Metering Infrastructure

Vancouver's Drinking Water Utility currently uses a "drive-by" Automatic Meter Reading (AMR) system to collect water consumption data from just over 28,000 water meters across the city. The AMR system is nearing the end of its twenty-year useful service life. As detailed in Section 4, Vancouver will implement Advanced Metering Infrastructure (AMI) by 2026.

AMI represents a technological leap forward for meter reading. It provides real-time data collection that continuously detect signals from thousands of meters. AMI implementation will also benefit Vancouver's goal to reduce dependence on fossil fuels by decreasing the need for drive-by meter readings and minimizing water loss from leaks—both of which help reduce greenhouse gas (GHG) emissions. Table 2 highlights several benefits AMI offers to support demand management.

Table 2: Benefits of Advanced Metering Infrastructure

AMI Benefit	Details
Data Collection Efficiency and Quality	• AMI offers more reliable, precise, and accurate data collection and quickly identifies meter reading issues. • Billing discrepancies are identified faster, compared to the current cycle delays of 3-4 months for issue detection.
Reading and Billing Frequency	• Data collection can occur up to hourly, compared to the current collection every 2-3 months. • Increased accuracy in readings and billing cycles; provides the option for more frequent billing. • AMI has a lower failure rate compared to existing AMR system.
Customer Service and Empowerment	• Meter data gives customers the tools to understand water use and adjust behaviours to reduce costs. • Allows for quick identification of billing issues and leaks, enabling immediate resolution.
Water Conservation and Leak Management	• Features advanced leak detection and identification of non-revenue water ("leakage"). • Provides metrics that reveal customer water use patterns, enabling targeted conservation strategies. • Can enable tiered rates that incentivize reductions in discretional water use.
Alignment with Corporate Goals	• Current AMR systems contribute to GHG emissions and increase operating costs. • Quick leak detection and resolution supports regional goals for water reduction. • Identifying non-revenue water improves user-pay billing and enhances customer equity.

3.3 Increased Water Metering

Universal water metering is widely recognized as a best management practice across North America[8], and Metro Vancouver encourages all members to move towards universal metering[9]. Without a fully metered water utility, it is difficult to accurately assess the extent of system leaks, private-side leaks, and optimize water system performance and ensure equitable cost recovery. Reliable metering also fosters transparency in the city-consumer relationship, offering a range of benefits that help to achieve water use reduction targets while enhancing customer equity (Table 3).

Table 3: Benefits of Water Meters

Benefits of Meters	Details
Leak Detection	• Current level of water loss and leakage in Vancouver is unknown; a 20% leak rate is assumed for water rate modelling purposes. • Industry research indicates that water leakage averages 16% for water systems across North America; utilities in similar age and composition to Vancouver have leak ranges from 15-25%[10]. • Meters, combined with AMI, can identify system leaks in real time, allowing for prompt resolution and reducing further water wastage[11].
Targeted Conservation	• Enables strategic investments and programming focused on high-usage sub-sectors, based on water use metrics (residential water use is currently estimated). • Allows targeted support to help customers reduce water bills. • Provides data on per capita water use and leakage levels; currently, unmetered properties account for 43% of total water purchases (2024).
Customer Service	• Meter data empowers customers to adjust their water use behaviour, potentially lowering their costs. • Metered customers receive alerts if their consumption exceeds typical usage. • Identifies private side water losses and leaks before they escalate to significant damage.
System Metrics, Optimization and Data-Driven Planning	• Improves water supply planning and system management strategies. • Enhances water demand forecasting and long-term supply capacity projections.
Billing Equity through User Pay Model	• Metered customers benefit from a user-pay model, ensuring they are billed on actual water use. • More accurately accounts for City-side leaks and un-billed private side water leaks. • Customers can lower their water bill by reducing usage (e.g., limiting lawn watering).
Alignment with Corporate Goals	• Enables strategic pricing with a more equitable billing structure in place. • Leak detection through metering supports regional water reduction goals. • Enhances customer equity by reducing costs associated with system leaks and non-revenue water.

[8] British Columbia Water and Waste Association (BCWWA), the Federation of Canadian Municipalities (FCM), the American Water Works Association (AWWA), and the Canadian Water and Wastewater Association (CWWA).

[9] Residential Water Metering Best Practices Guide.

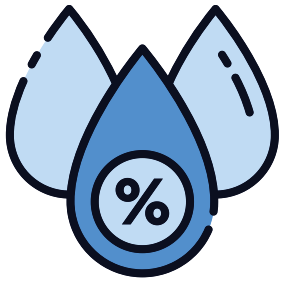
[10] According to the U.S. Environmental Protection Agency (EPA), the average water loss in public water systems is approximately 16%, with up to 75% of that loss being recoverable.

[11] The U.S. Environmental Protection Agency (EPA) emphasizes that unmetered systems face challenges in accurately identifying and addressing water losses. Implementing metering is a crucial step toward effective water loss control.

3.4 Water Rate Structure and Cost Recovery

Various utility rate structures are employed across the water industry to achieve specific goals, such as full-cost accounting, equitable cost recovery, and improvements in water conservation and demand management. The Auditor General for Local Government (AGLG) in BC supports metering and conservation incentivized water rates, outlining common water rate structures, policies, and strategies in their 2020 report[12] on Sustainable Financing in Drinking Water Management:

- Single Block Rates
- Excess Use Rates
- Seasonal Rates
- Fixed Charge vs. Variable Charge
- Tiered Rates
- Land Use and Industry-Based Rates



Vancouver adopted seasonal water rates for metered customers in 2012 to encourage conservation during peak demand periods. In 2019 Vancouver's seasonal rates were aligned with the regional water use restriction period from May 1 to October 15. During the peak summer period, Vancouver's metered water charges are 25 per cent higher per unit compared to the non-peak winter period. Similarly, Metro Vancouver applies seasonal rates for bulk water purchases. Metro Vancouver has only increased summer bulk water rates since 2021 applying 100 per cent annual rate increases to the June to September water rates to encourage water conservation[13]. Metro Vancouver's summer rate is now double the winter rate as of 2025.

The WDMS includes comprehensive rate reviews to:

- Assess and correct the equity of water charges between flat rate and metered customers (comparing flat rate charge vs. metered rates for similar usage).
- Review best practices and industry standards for water rate structures, policies, and strategies to support multiple utility objectives.
- Evaluate and recommend optimal rate structures for the transition period as residential flat-rate customers shift to metered rates.
- Recommend rate structures that balance long-term equity and sustainable cost recovery while promoting responsible use of existing water resources.

3.5 Implementation Co-benefits

Each of the components of the WDMS — AMI, metering, and water rate structure — offers distinct benefits, but together, more effectively reduce per capita water use, help to stabilize bulk water purchases, expedite leak identification, and enhance customer service and system management. As shown in Figure 6, AMI metering forms the foundation, and when paired with incentivized rates, it boosts conservation, efficiency, and system optimization. When all three components are in place, the city and its customers realize the greatest opportunity to achieve a sustainable, user-pay model that allows Vancouver to maintain resiliency.

[12] AGLG Sustainable Financing Drinking Water Booklet.
[13] 2025-2029 Metro Vancouver Financial Plan - Water Services

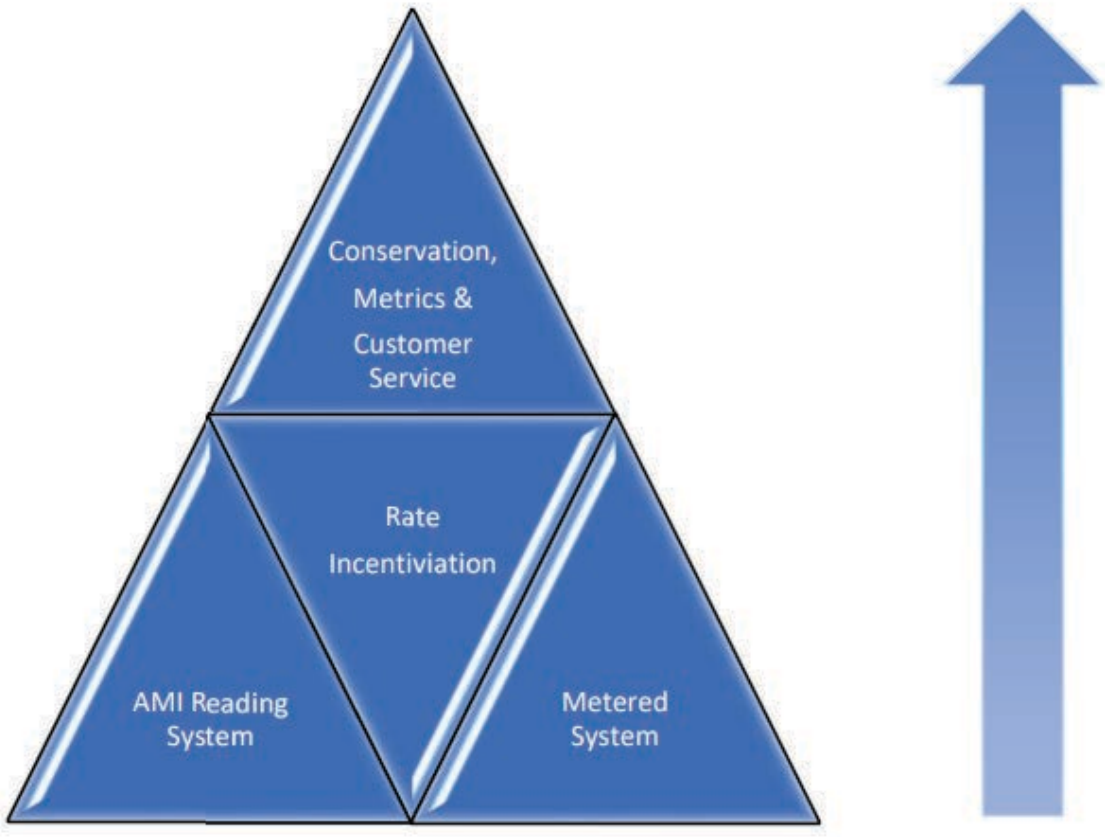


Figure 6: WDMS Components with Increasing Benefits.

3.6 Policy to Reduce Drinking Water Dependence

The WDMS aims to reduce per capita water use by 15 per cent from 2019 levels by 2030; however, as population growth and densification continue, overall water consumption will inevitably rise—even as individual consumption declines. While densification can lower per-person water use due to high-efficiency appliances, reduced outdoor watering, and smaller private landscapes, the cumulative effect of higher population density leads to an increase in water demand intensity compared to single-detached homes. Each person may use less water, but the concentration of people in denser developments results in greater total demand. Managing bulk water purchases and reducing per capita water consumption as Vancouver continues to grow will be an important step to ensure future housing targets and density can be accommodated in the city.

Beyond conservation efforts to reduce system leakage and improve efficiency, there is also opportunity to decrease reliance on high-quality drinking water for non-essential uses such as irrigation and toilet flushing. This “fit-for-purpose” approach recognizes that not all water uses require treated drinking water, helping to reserve potable water for essential needs like drinking, cooking, cleaning, and hygiene. As depicted in Figure 7, the circular economy of water includes fit for purpose water, recognizing the value in off-setting potable water use where possible.

The WDMS includes exploring policy options to further incentivize or require alternative water sources for non-drinking uses, as well as strategies to further reduce discretionary seasonal water use. These efforts would support conservation targets, address the cumulative effects of densification, and help stabilize bulk water purchases—an important goal as Metro Vancouver's water costs continue to rise.

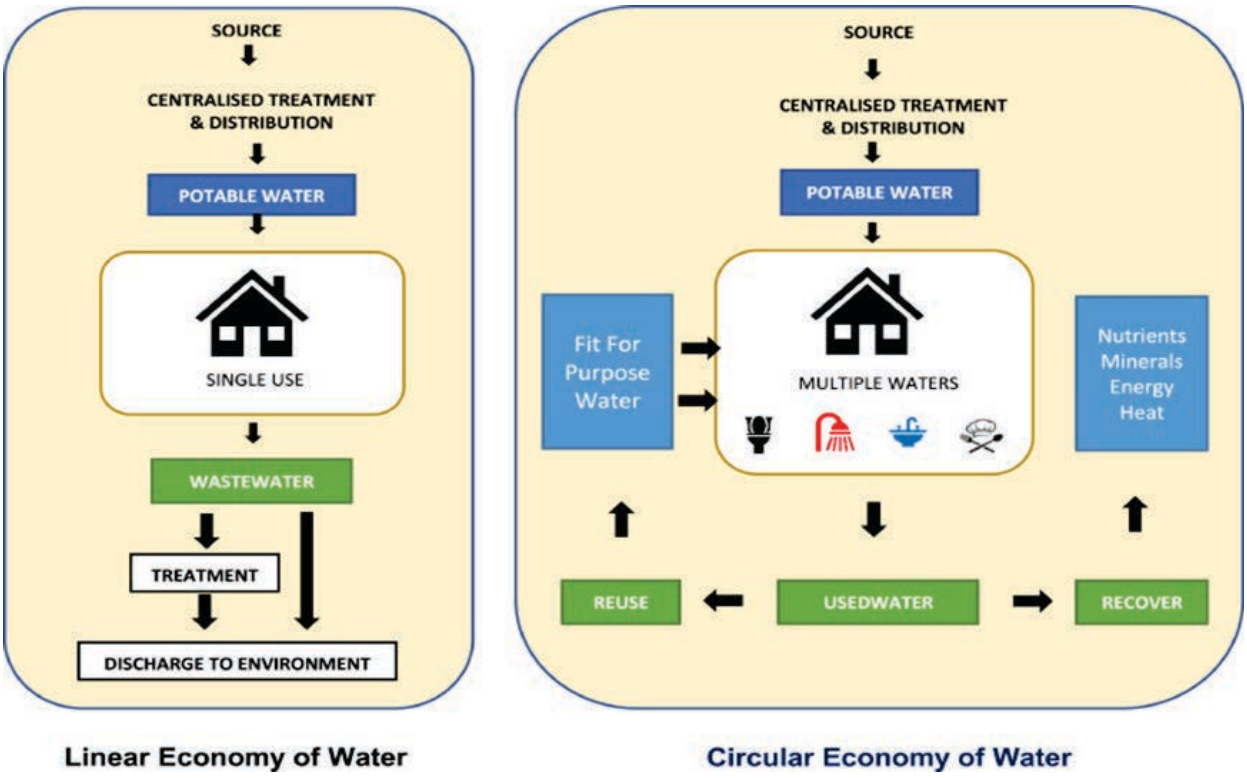
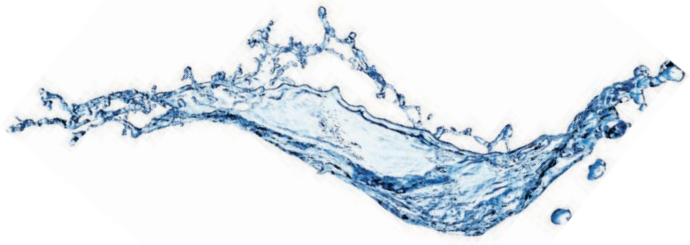


Figure 7: Comparing linear versus circular economy of water use[14].



14 How understanding the micro components of domestic water consumption can provide multiple water uses to facilitate a transition to a Circular Economy of Water - ScienceDirect.

Section 4: Water Demand Management Actions

4.1 Water Consumption Target

The Greenest City Action Plan (GCAP) successfully reduced Vancouver's per capita water use (total water consumption divided by population) by 24 per cent from 2006 levels by 2020. Actions included:

- Expanded outreach, education, and enforcement of water conservation measures.
- Retrofit programs supporting water-efficient appliances and fixtures.
- Stronger water efficiency requirements for new developments.
- Pilot metering programs to assess the feasibility of increased residential metering.
- A feasibility study for Advanced Metering Infrastruce (AMI).

The WDMS sets a new target to reduce Vancouver's overall per capita water use by 15 per cent from 2019 levels [15] by 2030, bringing average daily consumption across the city to 379 litres per person (Figure 8), inclusive of all Industrial, Commercial, Institutional (ICI), multi-unit, single-detached and duplex housing water consumption. Vancouver's per capita water for 2024 was 388 litres per capita per day, a 13% reduction from the 2019 demand.

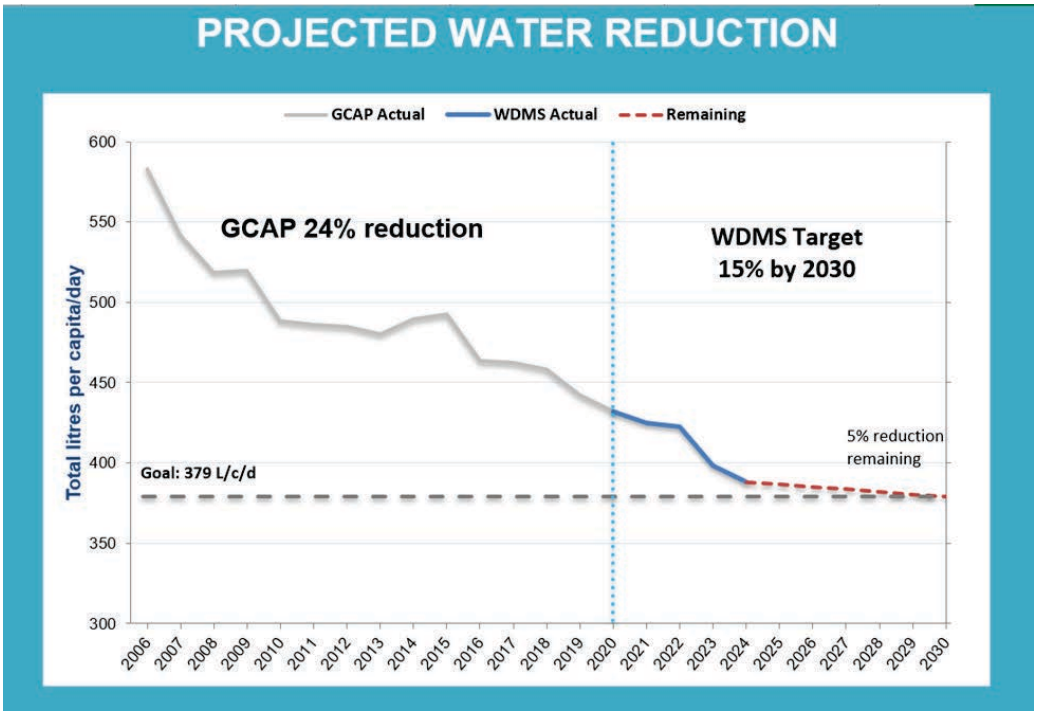


Figure 8: Vancouver's Per Capita Drinking Water Use Trends (2006 to 2030 Projected).

TARGET: 15 per cent per capita reduction from 2019 levels by 2030.

[15] 2019 baseline selected due to 'atypical' water use patterns in 2020 attributed to COVID-19 pandemic response.

4.2 Advanced Metering Infrastructure

The City's "drive-by" reading system has reached end of life providing Vancouver the opportunity to improve its water metering infrastructure by transitioning from Automated Meter Reading (AMR) to Advanced Metering Infrastructure (AMI). Vendor evaluation and pilot testing was conducted in 2024, and a Services Agreement was signed in 2025 to proceed with infrastructure upgrades and software implementation to transition the existing 28,000 meters. All meters will utilize AMI reading technology by end of 2026, including all new meter installs going forward.

ACTION #1: Implement AMI by end of 2026 to replace AMR meter reading system.

4.3 Accelerating Water Metering

Water metering has been part of Vancouver's infrastructure since the 1970s, initially mandated for ICI customers and Multi-Unit Housing properties. As of 2025, Vancouver has 28,000 meters covering all water services except for most single-detached houses and duplexes. Only 17 per cent of single-detached and duplex properties are metered (Figure 9), comprising 15 per cent of total connections across the city (Table 4). And while a total 86 per cent of water connections in Vancouver are related to single-detached and duplex housing, 43 per cent of consumption (68,000 connections) remains unmetered (Figure 10).

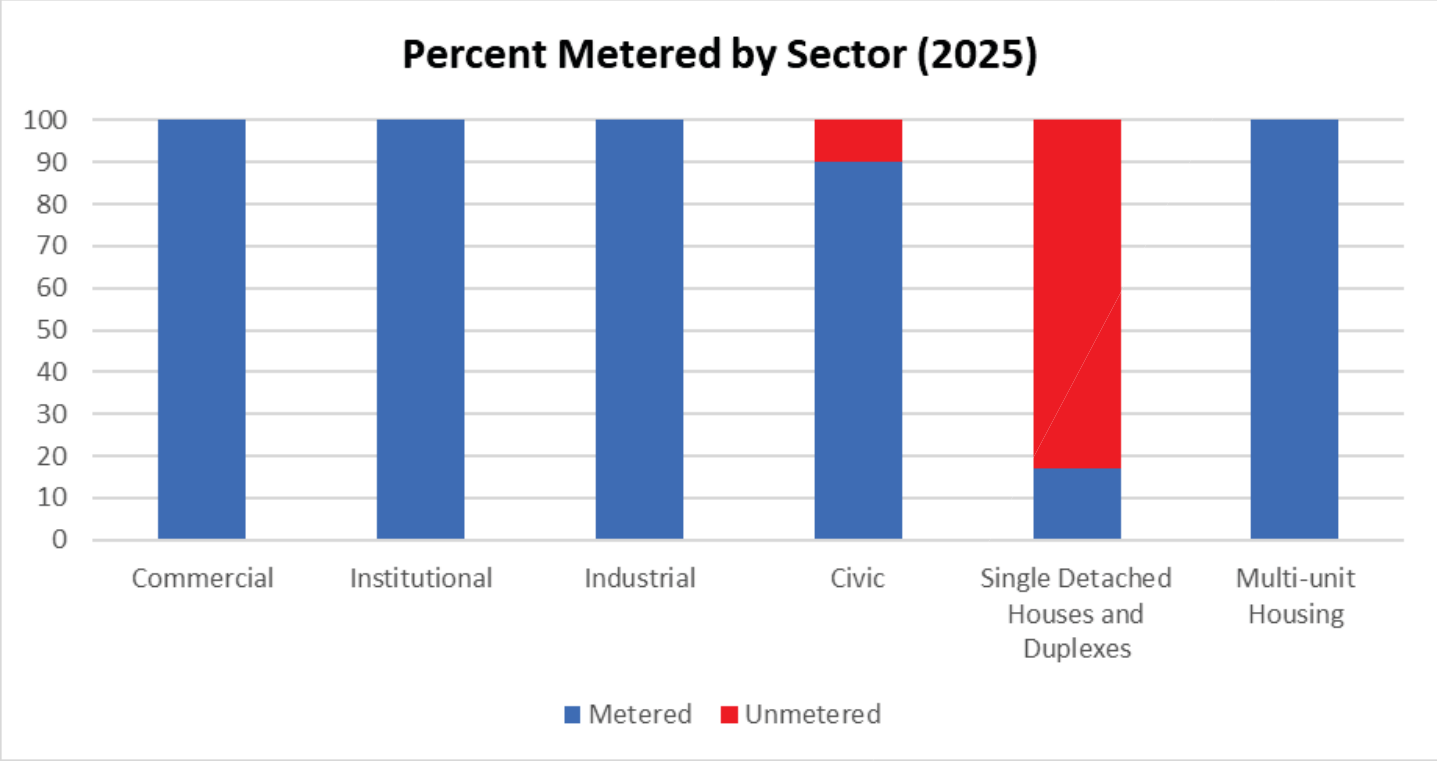


Figure 9: Percent Metered by Sector (2025).

Table 4: Water accounts by sector (2024).

	Fully metered since	Number of Accounts	Percent of Total Consumption
Single Detached Houses and Duplexes	New builds/renovations since 2012; phased metering for large lots & laneway home (2017-2023)	14,000	5%
Multi-unit Housing	Metered since 1970s	7,900	29%
Commercial	Metered since 1970s	4,800	14%
Institutional	Metered since 1970s	400	3%
Civic	Metering phases: 1970s, 2011-14, 2017-present	600	2%
Industrial	Metered since 1970s	400	3%
Other	-	100	1%
Unmetered	-	67,600	43%
TOTAL		**95,800**	**100%**

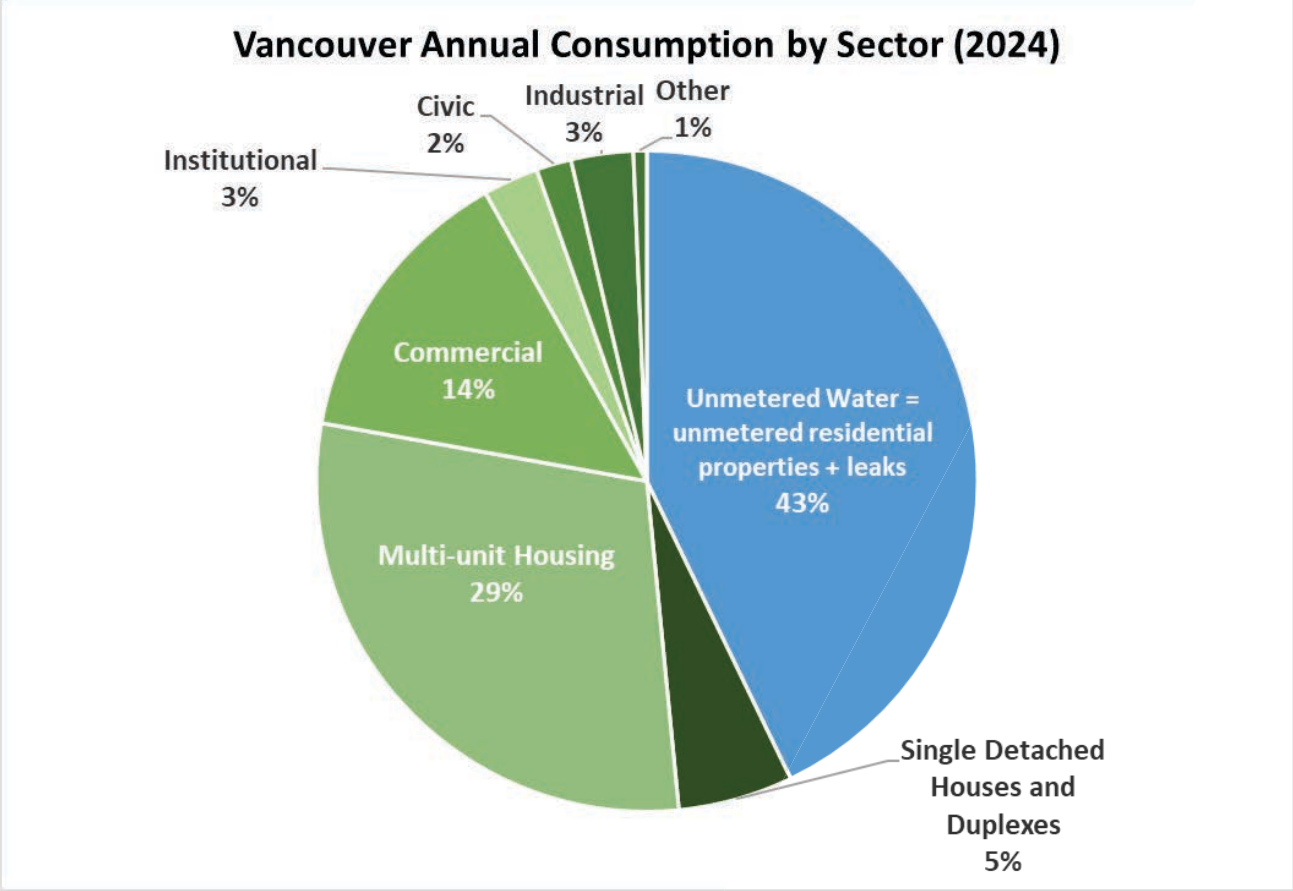


Figure 10: Annual Drinking Water Consumption by Sector (2024).

Apart from three Metro Vancouver regional water customers (Figure 11), Vancouver, like much of the region, is working towards achieving universal metering. In the absence of water meters, cost recovery models must extrapolate how much of the unmetered usage is due to actual residential consumption versus system leakage. Leaks are costly—an estimated 20 per cent of Vancouver's bulk water purchased in 2024 was lost to leaks, amounting to approximately $20 million in 2024 dollars. This leakage not only drives up water costs, it also hinders efforts to manage water demand effectively. In the absence of a fully metered utility, accurate data on full system usage for informed decision-making remains a gap.

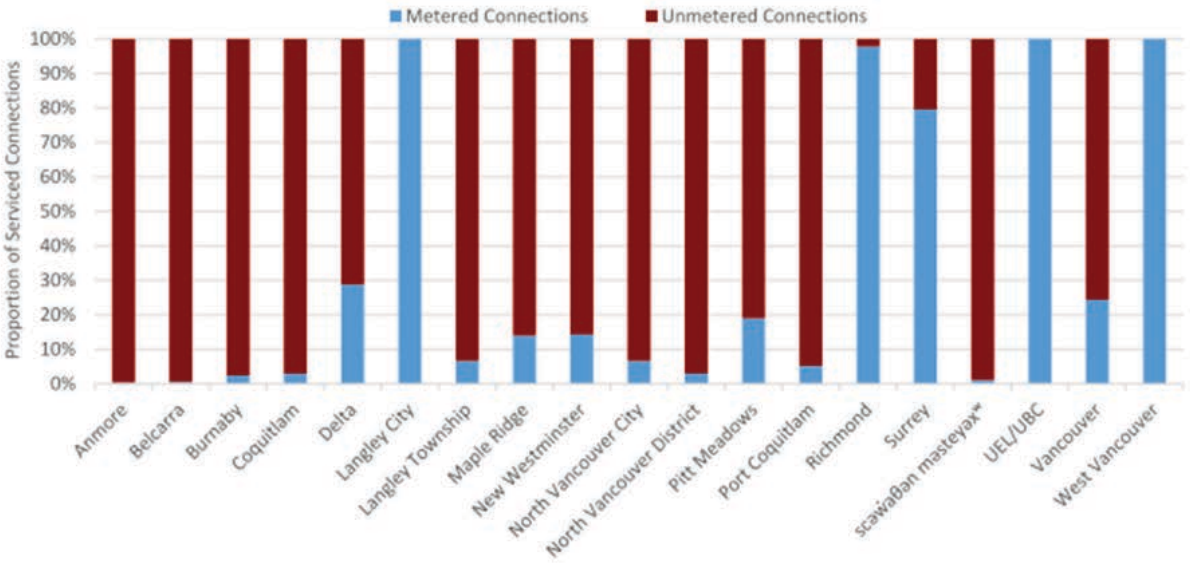


Figure 11: Proportion of metered and unmetered connections in 2021 by member jurisdiction.

With an average of 1,000 residential meters installed annually through redevelopment, achieving universal water metering without an accelerated approach would not occur until the 2090s. This delay would limit the city's ability to fully realize the financial and sustainable benefits of a metered system. To address this, strategic capital investments can complement redevelopment efforts and expedite the transition to universal water metering. By incorporating water meter installation into water main capital renewal projects and focused accelerated installations in currently un-metered residential neighbourhoods, Vancouver can achieve universal metering and the associated benefits of metering much sooner.

Installation of nearly 55,000 residential water meters, combined with meters installed through redevelopment, would be required to achieve universal metering by 2040. This approach could result in a universally metered water system 50 years sooner than relying solely on redevelopment. By investing in this accelerated installation, the city will not only save valuable resources but also gain the ability to more effectively manage water demand and reduce system losses. Early investment in water meters will enable better water conservation, streamline the cost-recovery process, and provide more accurate billing for residents, ultimately fostering long-term sustainability and resilience that continues to allow for growth and development.

ACTION #2: Accelerate water meter installation to achieve universal metering by 2040.

4.4 Optimizing Water Rates

Historically, annual water rate increases have been applied equally to both flat rate and metered customers. Water consumption analysis conducted in 2024 indicated that this approach no longer fairly distributes costs based on actual water use. While metered customers pay a fixed service charge plus a volumetric fee based on actual usage, unmetered properties continue to pay a flat rate, regardless of consumption. This structure provides little incentive for flat rate users to change water use patterns, as their costs remain unchanged regardless of how much they use.

To address this imbalance, Council approved freezing flat rate water service fees at 2024 levels for 2025, while applying rate increases only to metered customers until at least 2030[16]. Over the next five years, this phased approach will progressively align customer contributions with actual water consumption, ensuring a more equitable fee structure. This transition supports full cost recovery while preparing for a universally metered system, where all customers pay based on usage rather than a fixed charge.

The WDMS recognizes the key role Vancouver's water rate structure will play to incentivize continued reductions in water use. Industry examples have shown an average 20 per cent reduction in water use for customers moving from flat rate to AMI metering when paired with conservation-incentivized rates[17]. Further evaluation of water-use trends as more properties become metered will allow the city to explore various water rate options presented in Section 3.4 and implement water rates that promote demand management.

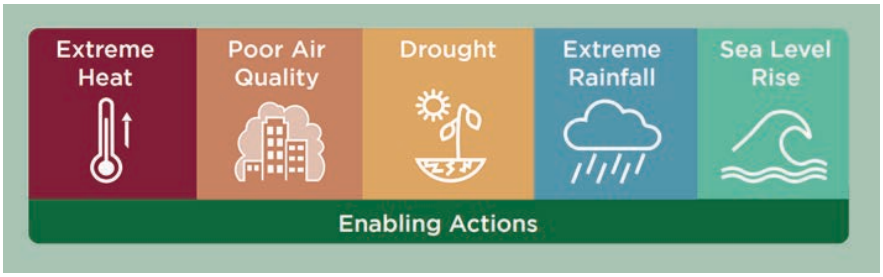
ACTION #3: Water rate structure evaluation and scenario analysis to achieve equitable cost recovery and to incentivize conservation.

4.5 Advancing Policy for Water Resilience

Vancouver continues to strengthen policies to address growing pressures on water resources. The Vancouver Building By-law (VBBL) allows, but does not mandate, rainwater and stormwater reuse for irrigation which can offset demands on drinking water. Ongoing work aims to expand opportunities for drinking water demands to be offset by greywater reuse and groundwater discharge—resources currently released into the sewer and storm system, respectively.

Vancouver's 2024–2025 Climate Change Adaptation Strategy (CCAS) Update, a companion to the City's Climate Emergency Action Plan (CEAP), further integrates water demand management into climate resilience planning. Notably, the CCAS update identifies drought as a primary climate hazard facing Vancouver. Often referred to as "Rain City," Vancouver's shifting weather patterns are resulting in increased seasonal drought conditions due to reduced snowpack, prolonged heat, and delayed rainfall. As shown in Figure 12, the update introduces three actions to enhance resilience and align City CCAS and CEAP actions with the WDMS.

[16] Council approved: 2025 Annual Review of Water Rates and Water Works By-law Amendments – RTS 16422.
[17] Waterworld.com Universal Metering.



Action	
D1.1	Accelerate residential metering and transition to AMI meter reading systems.
D1.2	Explore policy updates for increased non-potable water use in future developments under suitable densification scenarios.
D1.3	Explore policy that prohibits installation of in-ground residential lawn irrigation systems in new builds that utilize potable water and evaluate the effectiveness of current water restrictions related to in-ground irrigation of landscape.

Figure 12: CCAS Drought Actions as part of the five Risk Hazards in the 2024 update.

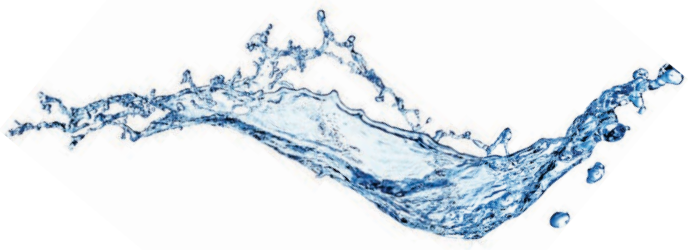
ACTION #4: Advance WDMS components to support CCAS Drought Hazard actions.

4.6 Water Conservation Programs

Vancouver's water conservation programming is foundational to sustainable water management, integrating local initiatives with regional strategies to effectively reduce per capita water use. Key efforts include public outreach and education campaigns that emphasize the value of water, actionable tips for reducing water waste, supporting customers through high-consumption reduction programs, and helping to identify and address costly leaks. Additionally, seasonal education and enforcement of the Drinking Water Conservation By-law reduces discretionary outdoor drinking water use and ensures a cohesive approach to safeguarding our water supply for current and future generations.

Vancouver continues to build on civic water use reductions targeted in GreenOps Plan 2.0 through civic water meter installations, adjusting pressure on water systems to reduce consumption, and leak detection and repair. User departments are supported in implementing innovative water demand management such as pressure reducing valves on irrigation, once through water feature retrofits, budgets for billed water use, and implementation of non-potable water options where feasible. A six per cent reduction in civic water use has been achieved since 2020.

ACTION #5: Continue and expand water conservation programs that align with local initiatives and regional targets, while leading by example with civic water use.



Section 5: Financial Framework

The WDMS is supported by long-range capital investment planning (10-year Strategic Capital Outlook), and four-year capital plans along with annual capital and operating budgets and rate forecasts to ensure strategic, sustained funding opportunities. While investments are required to implement the actions recommended in the WDMS, the benefits of the combined best practices approach provide significant opportunity for the City of Vancouver by addressing water leakage and reducing associated costs. Additionally, the demand reductions that can be achieved can help defer major capital upgrades and expansions, reduce operation and maintenance costs, decrease energy costs and green house gases associated with delivering water, and condense Vancouver's portion of regional infrastructure upgrades and system costs.

Universally metered utilities achieve an average leak rate around 10 per cent[18] compared to the estimated 20 per cent of the City's nearly $100 million bulk water purchase lost to leaks in 2024. Reducing the current 20 per cent leak rate to an industry average 10 per cent is the equivalent to 7,000 single-detached home's water demand. Further, residential water use associated with AMI metered homes billed through incentivized water rates reduce consumption by up to 20 per cent. For every five homes with AMI meters the city could save the equivalent water demand of one additional house, without an increase to our overall bulk water purchase.

5.1 Capital Investment

The total estimated capital investment required to deliver the infrastructure to implement the WDMS is approximately $220 million in 2024 dollars (Table 5):

- $31 million was approved as part of the 2019-2022 and 2023-2026 Capital Plans to support initiation of the WDMS actions.
- $48 million capital investment is projected for the 2027-2030 Capital Plan[19] to support meter installations.
- $140 million capital investment projection over 2031-2040 to complete universal metering.

Table 5: WDMS Capital Investments (2019 – 2040) to achieve universal metering by 2040.

		Investment Area	
	Capital Funding Approved/Required	AMI	Accelerated Metering
Capital Plan 2019-2022	$ 8,000,000	$ 4,000,000	$ 4,000,000
Capital Plan 2023-2026	$ 23,000,000	$ 3,000,000	$ 20,000,000
Capital Plan 2027-2030	$ 47,100,000		$ 47,100,000
Capital Funding 2031-2040	$ 140,500,000		$ 140,500,000
Total to fund WDMS Capital Investments (2019-2040)	**$ 218,600,000**	**$ 7,000,000**	**$ 211,600,000**

[18] AWWA, 2024.

[19] City of Vancouver Council approved the 2025 Annual Review of Water Rates and Water Works By-law Amendments (RTS 16422), which provides water rate projections to 2029 in support of this investment.

5.2 Operational Requirements

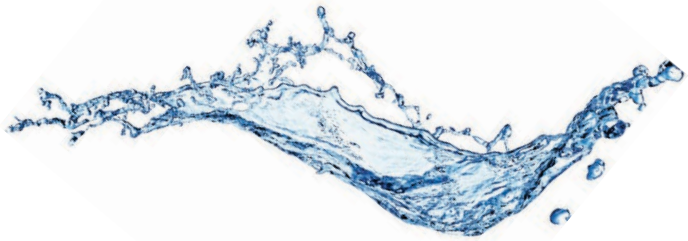
The implementation of universal AMI metering will allow for the reallocation of operational resources previously dedicated to manual and drive-by meter reading. These resources can instead be directed toward proactive maintenance strategies, including routine meter testing, scheduled replacement cycles, and system optimization. This shift is expected to reduce GHGs, reduce unexpected failures, and improve billing accuracy for customers.

As the number of meters in the system increase from 28,000 to over 90,000 by 2040, operational support will need to be adjusted. The AMI system and new residential meters are expected to have a service life of 20 and 25 years, respectively. Operating costs to support meter maintenance, billing, and customer support will change with the volume of meters, while economies of scale will offset these increases by reducing the per unit cost of meter reading and data management. Water meter operational resources are funded through Water Meter Fees as part of a customer's water bill, which are assessed annually and adjusted for cost recovery as part of the operating budget.

5.3 Recommendations

In evaluating current state and future opportunities to accelerate water metering, a balanced approach to cost and feasibility must be considered. While redevelopment of unmetered properties results in installation of approximately 1,000 new meters annually, this rate is insufficient to address the growing impact of water lost due to leaks. Relying solely on redevelopment to achieve universal metering would take an additional 50 years, and a lost opportunity to minimize cumulative water leakage expenses.

Strategic investment in accelerated metering over multiple capital planning cycles not only enables Vancouver to achieve a fully metered water utility sooner, but also delivers significant long-term benefits, including more timely leak resolution, ability to adjust water usage and water bills, and provides demand for new growth to meet municipal housing targets. It is recommended that capital investments align with a 2040 target for universal metering, ensuring fiscal responsibility while maximizing operational and environmental benefits.



Section 6: Looking Forward

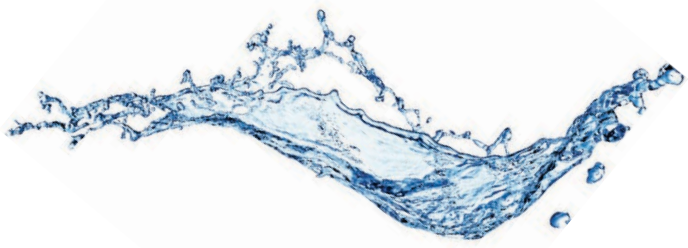
The Water Demand Management Strategy is a critical step toward ensuring the long-term sustainability, resilience, and financial equity of Vancouver's water system. Building on over a decade of successful conservation efforts, the strategy sets ambitious targets to reduce per capita water use a further 15 per cent and transition to a fully metered water utility by 2040.

Vancouver's progress to date—supported by the Greenest City Action Plan (GCAP) and other key policies—provides a strong foundation. However, with continued population growth, intensifying climate change impacts, and increasing pressure on water resources, Vancouver must evolve its approach to address both present challenges and future demands.

Key initiatives, including the deployment of Advanced Metering Infrastructure (AMI), the accelerated expansion of residential metering, and a more equitable rate structure, will enhance billing fairness, reduce costs associated with leaks, and will improve data management. Continued investment in targeted conservation programs and evaluation of alternative water sources will support Vancouver to ensure that high-quality drinking water is prioritized for essential uses, further supporting sustainability goals and allows the city to continue to grow.

Importantly, stabilizing bulk water purchases is a core financial and operational priority for the City. As water demand fluctuates due to population growth and seasonal variability, strategic reductions in per capita and overall consumption, paired with an equitable rate structure, will help manage water utility costs and reduce financial volatility. These measures ensure that the City's water utility remains fiscally responsible while supporting long-term conservation.

By continuing to innovate and invest in sustainable water practices, Vancouver is not only reducing its environmental impact but also strengthening its resilience to climate uncertainty. Looking forward we see a Vancouver that continues to value our water resources, a Vancouver that is measuring what we manage, and a Vancouver where customers are responsibly paying for the water they use. With strong policies, clear financial commitments and a focus on equity and innovation, the City of Vancouver strives to provide a sustainable and affordable water supply for generations to come.



WDMS Target & Actions

TARGET: 15 per cent per capita reduction from 2019 levels by 2030.

ACTION #1: Implement AMI by end of 2026 to replace AMR meter reading system.

ACTION #2: Accelerate water meter installation to achieve universal metering by 2040.

ACTION #3: Water rate structure evaluation and scenario analysis to achieve equitable cost recovery and to incentivize conservation.

ACTION #4: Advance WDMS components to support CCAS Drought Hazard actions.

ACTION #5: Continue and expand water conservation programs that align with local initiatives and regional targets, while leading by example with civic water use.

Coquitlam Water Supply Area (Source: metrovancouver.org)

Single Detached Home with Water Meter (Source: DWDM Team Images)

Engineering
Services