

TO: CHAIR AND MEMBERS
FINANCIAL MANAGEMENT COMMITTEE

DATE: 2021 July 06

FROM: DIRECTOR ENGINEERING

FILE: 39500-09

SUBJECT: UNIVERSAL WATER METERING

PURPOSE: To seek approval to develop a detailed implementation plan and rate strategy for Universal water metering and to set aside funding for implementation from Water and Sewer reserves.

RECOMMENDATIONS:

1. **THAT** the Financial Management Committee recommend Council to instruct staff to develop a detailed implementation plan and rates strategy for Universal water metering for approval by Council; and
2. **THAT** the Financial Management Committee allocate funding from Water and Sewer reserves as described in Section 4.0 of this report for implementation of water metering for all one and two family residential properties.

REPORT

1.0 INTRODUCTION

Heightened public interest in the safety and security of our drinking water supply, emerging concerns over water conservation and equity at the individual customer level has led to increased public interest in residential water metering. Water metering also represents a useful tool in the delivery and management of City water supply for all residents and businesses. Those communities that have already implemented a residential metering program have experienced operational benefits, including improved water conservation, leak detection and reduction, billing equity, improved planning and managing of water systems, and overall customer service.

Water metering is recognized as a best practice by Metro Vancouver, the BC Water and Waste Association, the Federation of Canadian Municipalities, the American Water Works Association and the Canadian Water and Wastewater Association.

This report identifies the benefits of water metering, current metering practice adopted by Burnaby and outlines residential metering program implementation opportunities for Council's consideration.

2.0 POLICY SECTION

Implementation of Universal Water Metering to improve water conservation, leak detection and reduction, billing equity, improved planning and managing of water systems, and overall customer service aligns with the following City policy:

- **Environmental Sustainability Strategy (ESS)** – Investigating water metering as a policy tool to encourage water conservation was identified from the ESS supporting the *Flow* goals and specific strategies and actions to conserve water in the home, garden, workplace and community (see specifically ESS Flow – Water Management strategy 2.4)

In addition to the policy noted above, implementation of Universal Water Metering supports a number of goals and sub-goals of the **Corporate Strategic Plan**:

- A Connected Community
 - Digital connection – Provide online access to core City services and information
- An Inclusive Community
 - Serve a diverse community – Ensure City services fully meet the needs of our dynamic community
- A Healthy Community
 - Healthy environment – Enhance our environmental health, resilience and sustainability
- A Dynamic Community
 - City facilities and infrastructure – Build and maintain infrastructure that meets the needs of our growing community
- A Thriving Organization
 - Financial viability – Maintain a financially sustainable City for the provision, renewal and enhancement of City services, facilities and assets
 - Communication – Practice open and transparent communication among staff, Council and the community
 - Technology and innovation – Support technology development and innovation to empower staff and to advance community objectives

2.1 Metro Vancouver

Metro Vancouver (MV) supports water metering as a best management practice and encourages local governments in the region to move towards universal metering over an accelerated timeline in order to obtain the highest benefits to the region. The approach was identified in a report titled *Residential Water Metering in Metro Vancouver: Best Practices Guide for Local Governments*, as endorsed by the Greater Vancouver Water District (GVWD) Board in September 2019. The report and guidelines were endorsed with the recognition that local governments may desire a specific approach to residential water metering that best meets their own objectives and requirements.

3.0 BACKGROUND

3.1 Benefits of Water Metering

Metering of both residential and Industrial, Commercial and Institutional (ICI) properties is commonly referred to as 'Universal Metering'. Combined with appropriate rate structures, universal metering can be a tool to promote conservation, manage peak demands affecting capital and operational expenditures, improve customer experience, and reduce environmental impacts (GHG/energy consumption) that relate to key Climate Action initiatives. Specifically, there are several system management advantages resulting from universal metering that are available to Burnaby:

- Enables more accurate and timely leak detection and repair response for customer service;
- Optimizes demand management that extends the useful life of existing infrastructure through deferral of capacity (capital) upgrades;
- Supports year-round water conservation efforts;
- Promotes energy conservation through managed consumption volumes and patterns associated with treatment and pump station operation. Note; approximately 10% of Burnaby's service areas are serviced by pumping facilities;
- Protects availability of supply for emergency use; and
- Improves customer experience - through billing equity and transparency, customer self-management and awareness and dispute resolution.

In their 2019 report (Metering Guidelines for Municipalities), Metro Vancouver public survey results showed that 85% of the public is in favour of water metering initiatives and billing equity. Approximately twenty homes in Burnaby were included in the survey, with similar conclusions.

Through metering, the customer is able to respond to possible leakages within their domestic (home) systems when presented with un-expected consumption volume data. Councillor Keithley, who had volunteered in the Department's recent baseline establishment program involving residential metering, had experienced a leak within his domestic plumbing system. Fortunately, staff was able to quickly identify/discover the leakage and advise Councillor Keithley, who had the leak resolved.

To: Chair and Members Financial Management
Committee
From: Director Engineering
Re: Universal Water Metering
2021 July 06.....Page 4

3.1.1 Water Conservation and Demand Management

The City currently uses water conservation programs to manage demand or consumption rates. The conservation programs are largely focused on education and awareness of outdoor water use (sprinkling), and some indoor uses (newer plumbing fixtures, etc.).

A (2007) survey of several Metro Vancouver municipalities, with voluntary or compulsory metering practices, showed reduced consumption of over 20% for metered customers.

The overall effect on water conservation is noteworthy, particularly during drought conditions, and underscores the need to manage this resource that is at risk due climate change, demand growth and urbanization.

3.2 Current Burnaby Metering Practice & Initiatives

The City's distribution network consists of approximately 740km of water mains and 36,000 service connections. Residential water use in one and two family dwellings are unmetered and subsequently, property owners face a flat annual rate regardless of actual consumption. Residential water consumption accounts for approximately 60% of the total water volume consumed across Burnaby.

As far as metering of multi-family developments, the City implemented a requirement for developers to identify appropriate metering strategies for their buildings. The plumbing bylaw calls for installation of meter setters or other provisions for future meter installation in the building mechanical systems. Developers are not required to install meters at this time.

All of the approximately 2,500 ICI customers are fully metered and are charged for water use based on actual consumption. ICI customers represent about 30% of the City's total annual consumption.

Burnaby purchases bulk water from Metro Vancouver to distribute to residents and businesses across the City. This bulk water supply is currently valued at over \$30M annually.

A Water Balance Audit conducted by Engineering in 2015 estimated Non-Revenue Water (NRW) volume at about 17% of the bulk water volume purchased from Metro Vancouver. NRW includes several components including system leakage, Engineering, Parks and Fire Service operational use, irrigation and meter reading inaccuracies. System leakage is traditionally the most significant source of NRW. However, confidence in the water balance audit is low without the availability of universal metering data.

3.2.1 Residential Water Meter Baseline Establishment Program

In 2016, Engineering initiated a Water Meter Baseline Establishment Program. Meters were installed at a sample of residential properties in conjunction with Capital Program projects involving watermain renewal. The initiative included City forces installation of meter boxes, setters and meters at the time of construction of the respective watermain projects. Approximately 115 residential properties (mostly single family) were equipped with a meter for the purpose of collecting baseline consumption data. With the data collected to date, a number of general observations are possible;

- The average consumption per household (single family) is estimated at 1.05 m³/day, ranging from a low of 0.4 to a high of 1.7 m³/day, based on three years of consumption data. This observation includes elimination of outliers from the data set. The average annual cost of water for a single family home is estimated at \$640, based on this relatively small sample size. Burnaby's current flat rate for a single-family home is \$627.
- Duplexes and homes with secondary suites (where known) show a higher average consumption rate of 1.15 to 1.84 m³/day, for an estimated cost of water ranging from \$725 - \$1,125 annually. The bylaw flat rates for either a duplex or a home with a secondary suite (supplemental fee of \$313.50) is \$940.50.
- There were at least six households (~ 5%) with exceptionally high consumption volumes ranging from 2.1 m³/day to 4.05 m³/day. In such cases the flat rate is clearly not equitable.
- Based on an assumed 3.1 persons per Single Family (SF) home, the average consumption rate (per capita) equates to about 332 L/person per day. This number compares fairly reasonably with a prior estimate by Metro Vancouver of 463 L/person/day. However, it is not clear how the relatively small sample included in the baseline program compares to the Burnaby average with regard to persons per household.
- From an international perspective, our local water consumption rate is comparatively high; other jurisdictions (Sweden, Denmark, Israel, etc.) have recorded water consumption rates below 200 L/person/day. Studies show that the USA, Greece and Canada have some of the highest water consumption rates in the world (source; www.statista.com).

3.3 Water Meter Technology

Engineering has explored available technologies involving advanced (electronic and/or online) systems to manage ICI meter reads. Upgrade of the ICI meter reading system will include the ability to expand the system to include residential meter reading when universal metering is adopted. The selected technology will allow more transparency in data collection and enable online viewing by the customer, including automated notices to inform customers of abnormal consumption patterns that could be indicative of a leak.

To: Chair and Members Financial Management
Committee
From: Director Engineering
Re: Universal Water Metering
2021 July 06.....Page 6

4.0 IMPLEMENTATION STRATEGY

Engineering has evaluated the feasibility of implementing a Universal Metering strategy for Burnaby. With Council's approval, a detailed implementation strategy and proposed rate policy could be developed for review by Council before the end of the year.

At a high level, the cost of metering all one and two family residential properties would be approximately \$30 million at a unit rate of \$1,000 per meter installed, depending on details of the implementation plan. The full cost of implementation could be recovered through both the Water and Sewer reserves, avoiding additional cost impacts to utility customers. With the available funding, all one and two family residential properties could be metered within five years. Such an implementation strategy would be similar to the one adopted by West Vancouver as described in the Metro Vancouver Guideline document.

Nearly 4,000 residential properties have already been equipped with a basic meter box and setter (no meter) that were installed as part of Capital Program watermain and service renewals that were completed since 2016. This reduces the cost and disruption to these homes for meter installation.

The first phase of implementation would likely focus on areas of greatest interest and benefit, starting with homes with secondary suites. Metering properties with secondary suites would remove the current administrative effort around Secondary Suite Declarations that are required annually involving about 7,400 properties. Over 30,000 letters are sent each year requesting single-family homes to document any changes to their secondary suite status. Billing for actual water consumed would remove this requirement.

Staff would also review options around frequency of billing, water and sewer rate setting and management of customer service around general inquiries and leak management.

5.0 CONCLUSION

There is consensus that implementation of a universal water metering program results in better managed systems, equitable billing and lower water consumption. Updated meter reading technology provides the ability to share consumption data with each individual consumer, for self-management, consumption and cost control. This leads to improved customer service and satisfaction.

To: Chair and Members Financial Management
Committee
From: Director Engineering
Re: Universal Water Metering
2021 July 06.....Page 7

It is feasible to implement water metering for all one and two family residences within five years. The costs of this program could be fully recovered from existing Water and Sewer reserves thereby avoiding additional costs to Utility customers. Staff could develop a detailed implementation strategy and proposed rate policy by the end of the year.

6.0 RECOMMENDATIONS

It is recommended that the Financial Management Committee recommend Council to instruct staff to develop a detailed implementation plan and rates strategy for Universal water metering for approval by Council and that the Financial Management Committee allocate funding from Water and Sewer reserves as described in Section 4.0 of this report for implementation of water metering for all one and two family residential properties.



Leon A. Gous, P.Eng., MBA
DIRECTOR ENGINEERING

REW/SR:ac

Copied to: Acting City Manager
Director Corporate Services
Director Finance
Director Planning & Building
Director Parks, Recreation & Cultural Services
City Clerk