CITY OF NANAIMO
THE HARBOUR CITY

City of Nanaimo

Water Metering Policy and Strategy

Public Works Committee

Steve Brubacher

January 10, 2018

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Presentation Overview

- Background
- Process and Results
- Strategy and Policy

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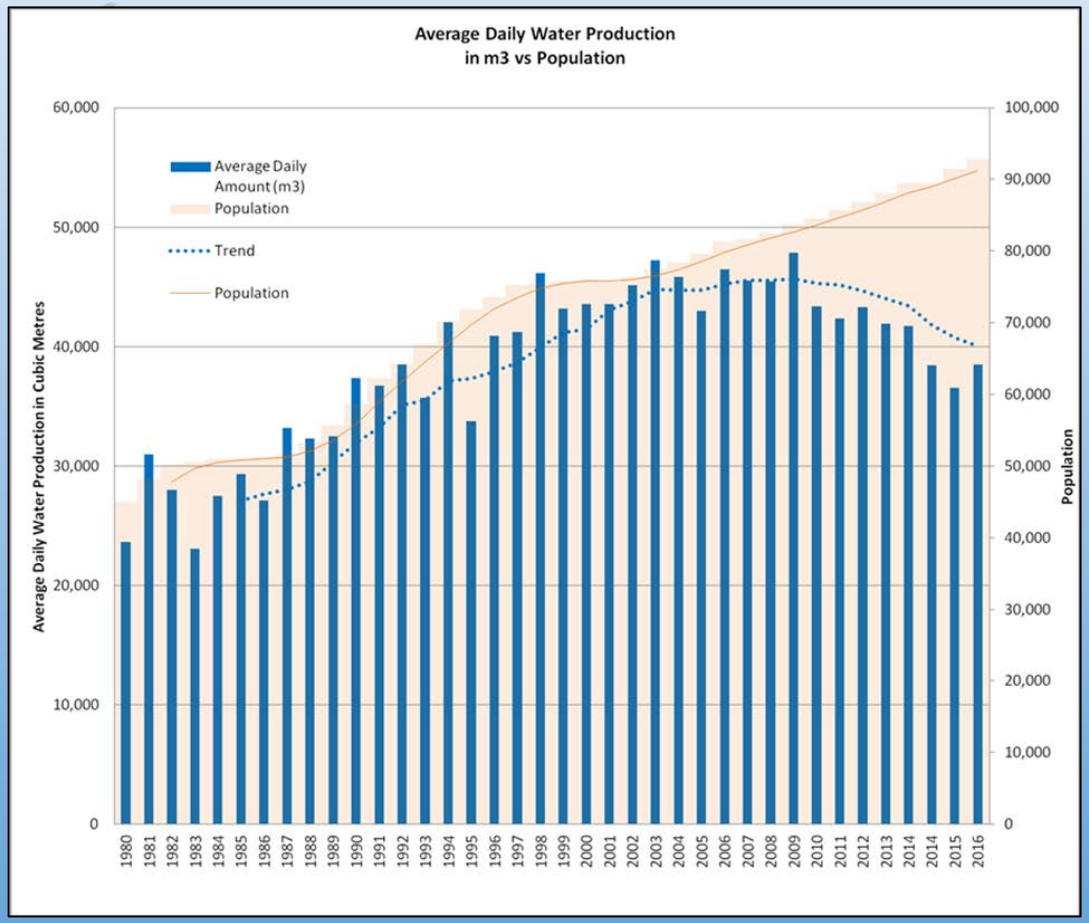
Background



Water Efficiency Practices - 1978 +

- Integrated into City design practices and current MoESS.

Universal Water Metering - 1983 +

- 25,350 meters (24,000 residential and 1,350 ICI).
- 50% of meters exceed the estimated 20 year service life.

Full Cost Pricing for Water - 1992 +

- Rates reflect the full cost of providing water service.

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Background

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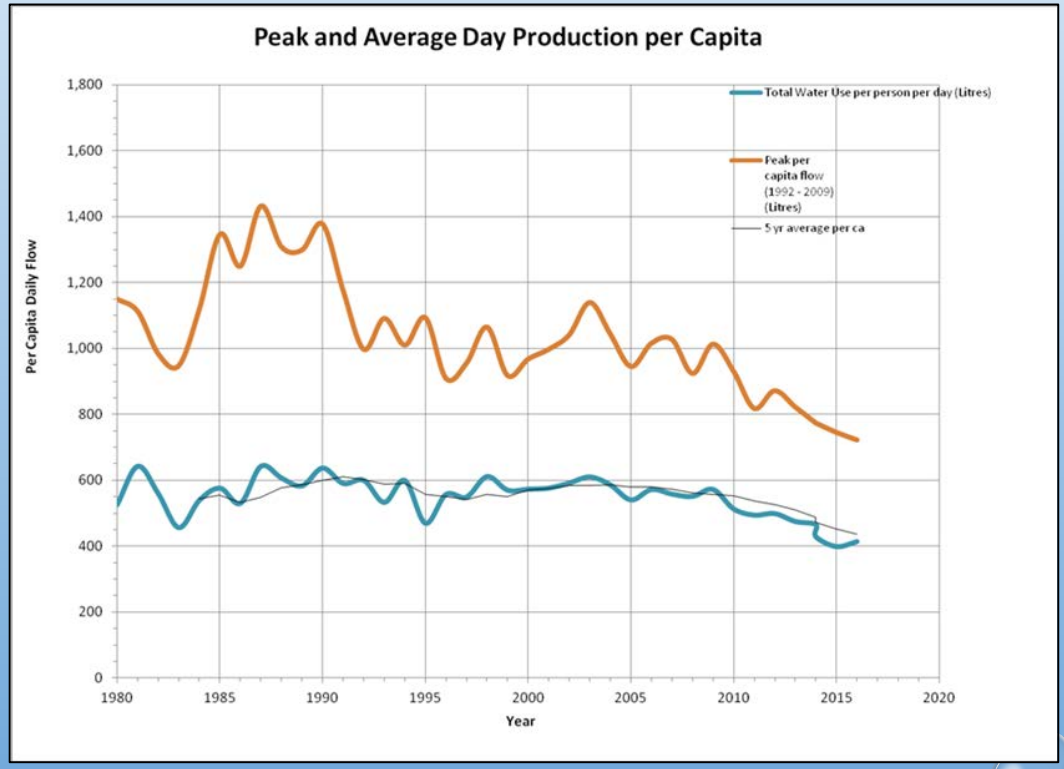

Process and Results

Developed Metering Drivers and Metrics

Completed 6 Business Cases

Prepared Metering Strategy and Policy

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Metering Drivers and Metrics

Driver	Measure of Success	Current Practices
Water Conservation	• Targeted 10% reduction in per capita residential water consumption per decade.	
Water System Management and Monitoring	• Target Infrastructure Leakage Index (ILI) of 2.5 or lower (currently 1.5).	
Water Consumption Based Equity Billing	• 100% of properties metered. • Billing external bulk customers at equitable rates. • Billing internal customers at equitable rates. • Use water bills as a tool to communicate with customers.	
Raise Awareness of the Value of Water	• Level of public support for water rates. • Public knowledge of City water system. • Public voluntary willingness to conserve water (behavioral change). •	
Water System Forecasting	• Forecasts are accurate and allow for effective prediction of future needs. • Annual assessment.	
Water Supply, Treatment and Conveyance System and Asset Funding	• Adequate funds are available for water system operations as well as infrastructure renewal, replacement, and upgrading.	

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Metering Drivers and Metrics

Themes:

- City is performing well.
- Primary driver is long-term success / asset renewal.
- Asset renewal provides opportunities.

Business Case #1

Meter Location

Meter Placement

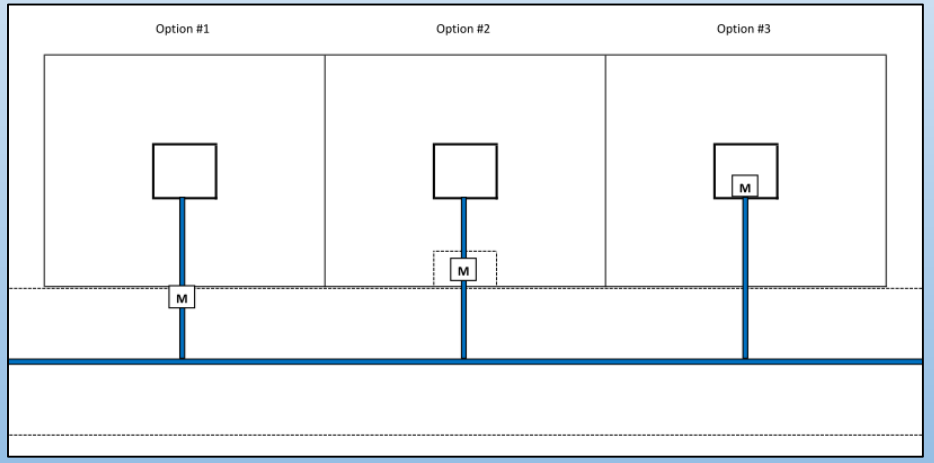
- Locate meters outside at property line (current practice) or inside within building?

Meter Configuration

- Separate domestic and fire services at property line or combine into single service?

Metering for Stratas

- Single bulk meter for stratas or multiple meters installed at each individual unit?



Account	Criteria	Quantitative Evaluation	Qualitative Evaluation
Capital	Cost	✓	
Operations and Maintenance	Access		✓
	Cost	✓	
Social	Leakage	✓	
	Liability		✓

Business Case #1

Meter Location

Meter Placement

- Outside meters preferred unless sufficient space doesn't exist, then meter can be installed inside.

Meter Configuration

- Separate services with FM Approved / UL Listed double detector check valve. Combined lines only to be considered for large setbacks.

Metering for Stratas

- Single meter (FM Approved / UL Listed for combined fire services) unless City owned watermain, then meter for each unit.

Business Case #2

Public vs Private Ownership

Outside Meter Installations

- Most common to smaller domestic meters located at property line.

Inside Meter Installations

- Typically ICI customers with a meter installed within a mechanical room.

Backflow Prevention Devices

- Mandatory for high hazard facilities, but recommended for all services.

Evaluation Criteria
Risk
Revenue
Maintenance
Ancillary Benefits
Legislative Limits
Cost Effectiveness

Business Case #2

Public vs Private Ownership

Outside Meter Installations

- Continue current practice of City owned meter, chamber, and associated piping.

Inside Meter Installations

- City to own meter only with access agreement in place for maintenance.

Backflow Prevention Devices

- City to own dual check valve if installed as part of meter setter. All other backflow prevention devices to be owned by property owner.

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Business Case #3

Meter Sizing

Non-Fire Service Meters

- Locate on dedicated domestic services where practical
- Adopt AWWA M22 meter sizing methodology (with slight modifications).
- Sizing tool provided in MoESS.

Fire Service Meters

- Size meters in accordance with Fire Underwriter's Survey and National Fire Protection Association Standards.

Oversized meters can contribute to lost revenue associated with under-registration and result in high capital / replacement costs.

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Business Case #4

Metering Technologies

Small Diameter Meters

- Majority of the City's meter population, predominantly servicing residential customers.

Large Diameter Meters

- Servicing select ICI customers where water use warrants a larger meter.

Fire Service Meters

- FM Approved / UL Listed meters on combined fire / domestic services.

Evaluation Categories
Materials / Dimensions
Regulatory Approvals
Performance Specifications
Ancillary Features
Operations and Maintenance
Capital Cost
Local Support / Applications

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Business Case #4

Metering Technologies

Small Diameter Meters

- Majority of the City's meter population, predominantly servicing residential customers.

Recommendation:

- Sensus SRII
- Neptune T-10

Large Diameter Meters

- Servicing select ICI customers where water use warrants a larger meter.

Recommendation:

- Sensus OMNI C^2
- Neptune TRU/FLO *

Fire Service Meters

- FM Approved / UL Listed meters on combined fire / domestic services.

Recommendation:

- Sensus OMNI F^2
- Neptune HP Protectus III

** Depending on selected reading system.*

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Business Case #4

Metering Technologies

Additional recommendations:

- Selected meters will permit the greatest flexibility for future reading system.
- Continue to monitor trends in water metering.
- Limit approved metering products to 3 manufacturers for operational efficiencies associated with stocking meter inventory, spare parts, read compatibility, and staff familiarity with materials.

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Business Case #5

Meter Reading Systems

Reading Approach

- Touch read (status quo), walk-by radio read, drive-by radio read, fixed base radio read, or hybrid.

Short-Listed Systems

- Established and emerging reading systems on the market.

Procurement Approach

- Competitive and transparent means of seeking the best reading solution for the City.

Evaluation Categories
System Type
Power Requirements
Radio Frequency Licencing
One-Way vs Two-Way Communication
Migration Capabilities
Meter Compatibility
Interface Software
Local Support / Applications

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Business Case #5

Meter Reading Systems

Reading Approach

- Radio read technologies offer operational and customer service benefits, but represent a cost premium compared to touch read.

Short-Listed Systems

- ESensus M Series, Neptune R900i, Itron 100W and consideration for Master Meter Allegro.

Procurement Approach

- Request for Proposal process whereby systems can be evaluated based on multiple criteria.

Business Case #6

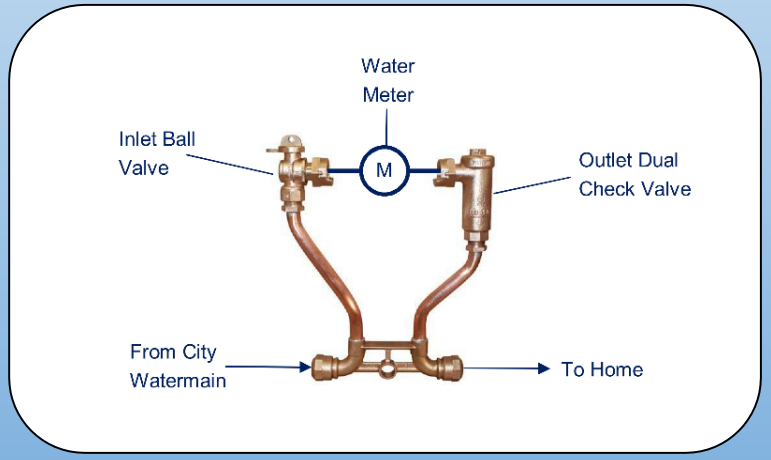
Meter Replacement

Residential Meters

- Age is considered the primary factor for prioritizing residential meter replacements.
- Consider adoption of setters in conjunction with next large change out and update of MoESS.

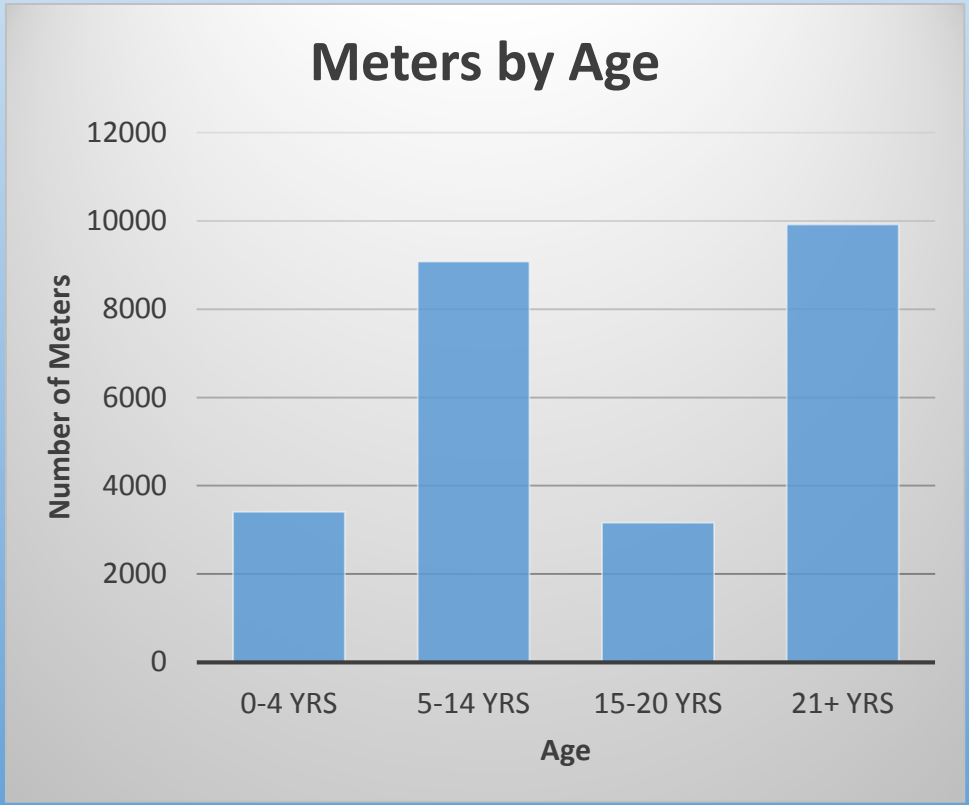
ICI Meters

- Replacement of ICI meters should be assessed on a case-by-case basis.



Business Case #6

Meter Replacement



- Current replacement frequency is about 3% per year (33 year replacement cycle).
- Prioritize ICI replacements where lost revenue is greatest.
- For remainder target just in time replacement (aligned with typical 20 year service life).

Presentation Overview

- ✓ Background
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Metering Strategy Considerations

Design Criteria and Specifications

- Keep MoESS up to date.

Procurement

- Ensure City resources are deployed strategically and leveraged with specialist input.

Records Updating

- Integrate records updating with new developments record keeping, maintenance, and capital works.

Contract Administration

- Appoint a metering champion.

Monitoring and Reporting

- Test source meters regularly and consider meter accuracy when water audit is updated.

Implementation

- Identify short, medium, and long-term actions.

Short-Term Actions

- Finalize Metering Strategy and Policy
- Complete Residential and ICI Meter Replacement Business Case
- Review Records and Data Keeping Process
- Confirm Procurement and Contract Administration Approach
- Test Source Meters

Medium and Long-Term Actions

- Implement Meter Assessment and Replacement Program
- Conduct Leakage Surveys and Flow Monitoring
- Update Metering Strategy
- Update Water Audit

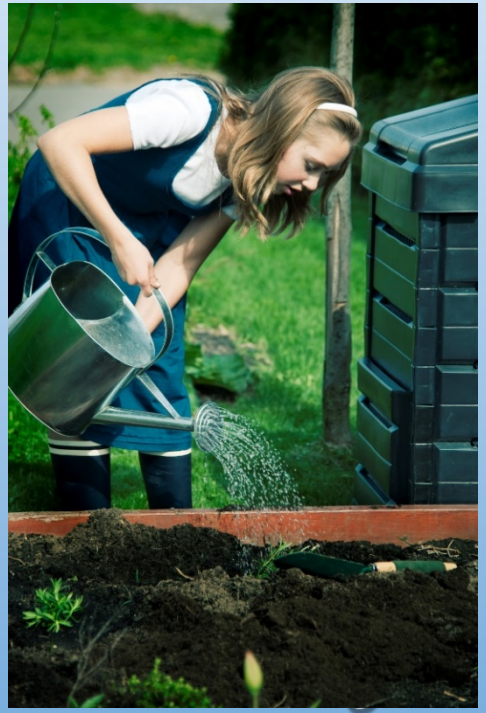
Metering Policy Objectives

To ensure adequate provision of potable water is made in line with the City's commitments for both today and future generations.

- Legislative Requirements
- Asset Management
- Sustainable Service Provision
- Reduction of Water Use
- Water Conservation Effectiveness
- Avoid Oversizing Infrastructure
- Minimize Ecological Footprint
- Continuous Improvement

Water Conservation Aspects

Council's vision and goal for the community which are outlined in the OCP and Water Supply Strategic Plan include implementing wise water use and conservation practices.



- Water Stewardship Vision Statement
  - Water usage will reflect industry best practices and place Nanaimo as a leader in water conservation (consistent with 2012-2015 Strategic Plan)
    - 10% per decade water use per capita reduction
    - 10% reduction in real losses by 2020 from 2013
    - Maintain leakage index of 2.5 or lower
    - Update Water Audit every 5-10 years
    - Maintain accurate water demand forecast

Water Conservation Aspects

Council's vision and goal for the community which are outlined in the OCP and Water Supply Strategic Plan include implementing wise water use and conservation practices.

- Water Stewardship Vision Statement
  - Water rates are equitable to all customers
    - 100% of properties are metered
    - Rates are equitable
    - Rates reviewed and updated very 5 years
    - Rates cover operations, renewal, replacement and upgrading
    - Growth pays for growth

Water Conservation Aspects

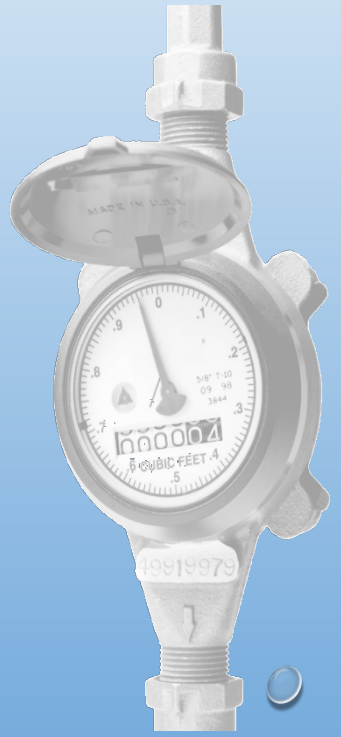
Council's vision and goal for the community which are outlined in the OCP and Water Supply Strategic Plan include implementing wise water use and conservation practices.

- Water Stewardship Vision Statement
  - The public within the City of Nanaimo are aware of the value of water
    - Customer surveys (when completed) indicate high level of knowledge and support for rates
    - Voluntary willingness to conserve water
    - Water bills used effectively to communicate water use information

Water Conservation Aspects

Council's vision and goal for the community which are outlined in the OCP include implementing wise water use and conservation practices.

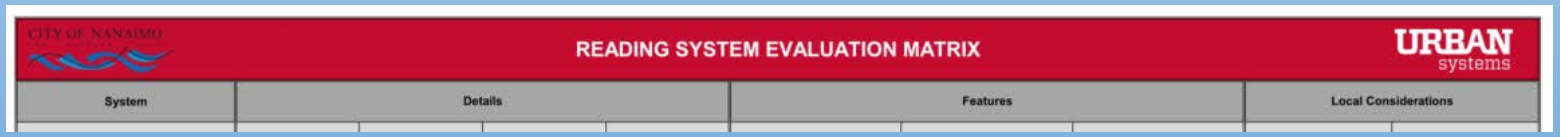
- Water Metering
  - Water meters economically capture the majority of water use
    - Meters at property line where practical
    - Domestic and fire services separated where practical
    - Sizing to AWWA best practices



Water Conservation Aspects

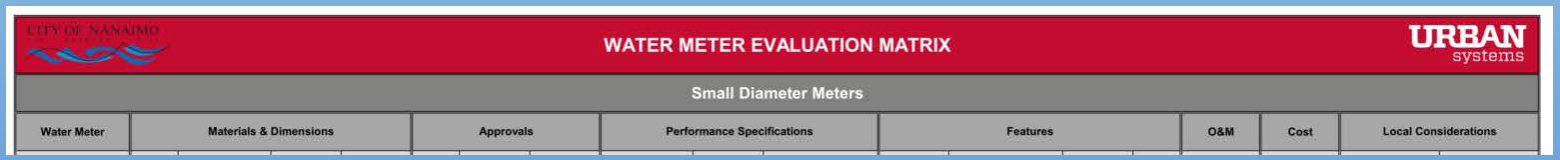
Council's vision and goal for the community which are outlined in the OCP and Water Supply Strategic Plan include implementing wise water use and conservation practices.

- Water Metering
  - Technology chosen to support City goals
    - Reading system selection based on criteria identified in Strategy
    - Upto 3 meter manufacturers selected based on criteria in Strategy
    - New technology evaluated through 2 year pilot program
    - Effective capturing and use of data



READING SYSTEM EVALUATION MATRIX

System	Details	Features	Local Considerations



WATER METER EVALUATION MATRIX

Small Diameter Meters

Water Meter	Materials & Dimensions	Approvals	Performance Specifications	Features	O&M	Cost	Local Considerations

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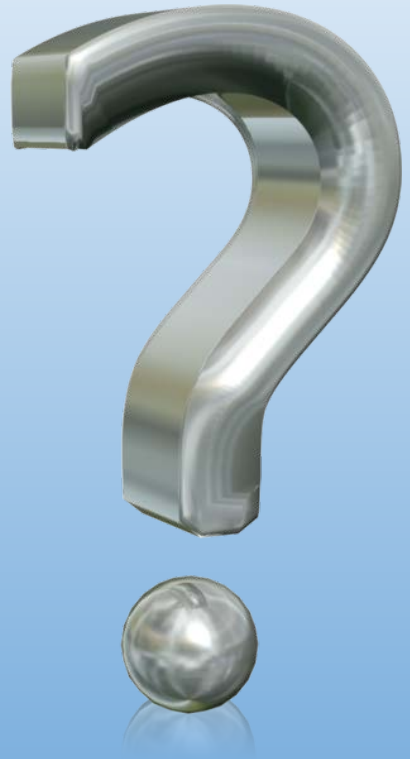
Questions



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