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MAKING FIXED NETWORK AMI AN INTEGRAL PART OF YOUR CONSERVATION PROGRAM

Conservation Through Information

Water Smart Conference

Las Vegas, NV

October 8, 2010

PRESENTATION AGENDA

- What is an Fixed Network AMI System?
- Distribution System Monitoring
  - District Metering Areas
  - Acoustic Leak Detection
- Consumer Side Leaks
- Conservation Program Validation
  - Watering Restriction Monitoring
  - Conservation Device Effects
- Benefits of a Customer Web Portal
- AWWA / IWA Water Balance Audit
- Questions / Answers / Discussion

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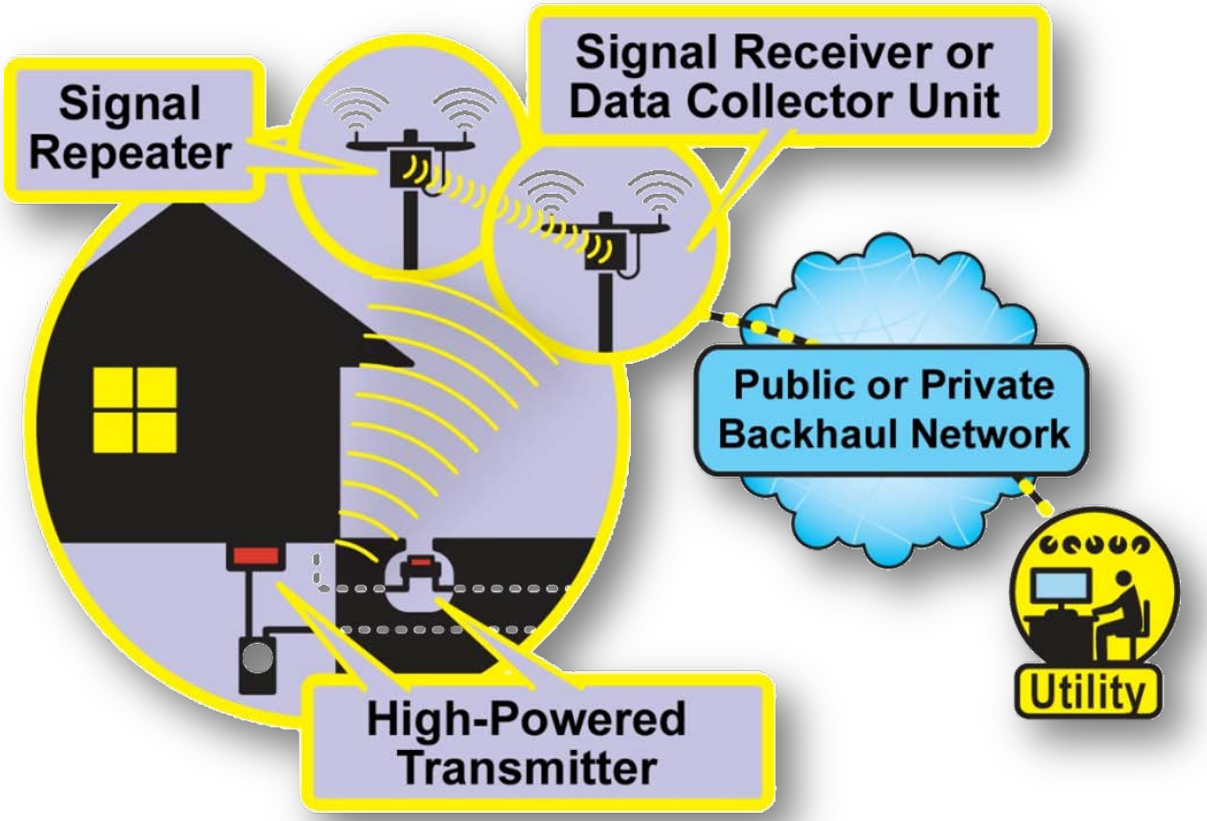
WHAT IS A FIXED NETWORK?

WHAT IS A FIXED NETWORK AMI SYSTEM?

- System Components
  - –Higher-powered meter transmitters or transceivers
  - –High-Level or Low Level Data Collectors
  - –Public or Private Data Wired or Wireless Backhaul Network
  - –Powerful Reading Data Management Software
- AMI Systems provide:
  - –Increased Operational Efficiency
  - –Optimization of Resources
  - –Improved Customer Service
  - –Ability to make Information Driven Utility Decisions
  - –Improved Conservation Efforts

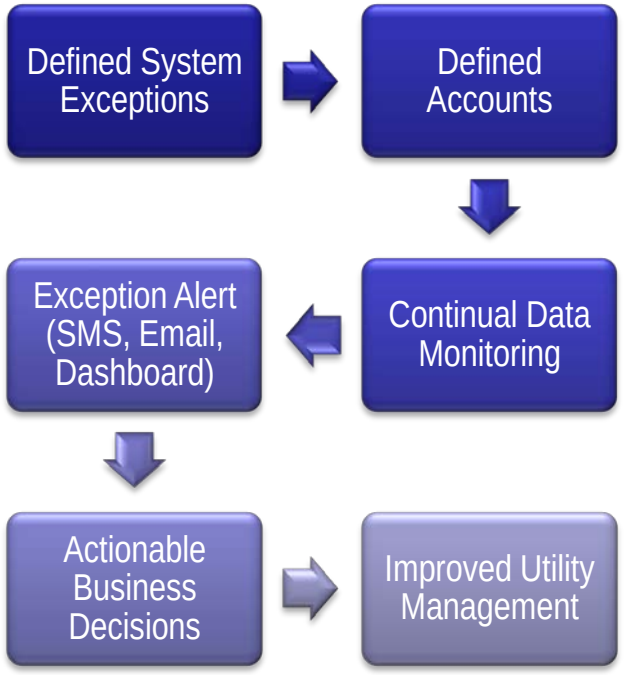


READING DATA MANAGEMENT SOFTWARE

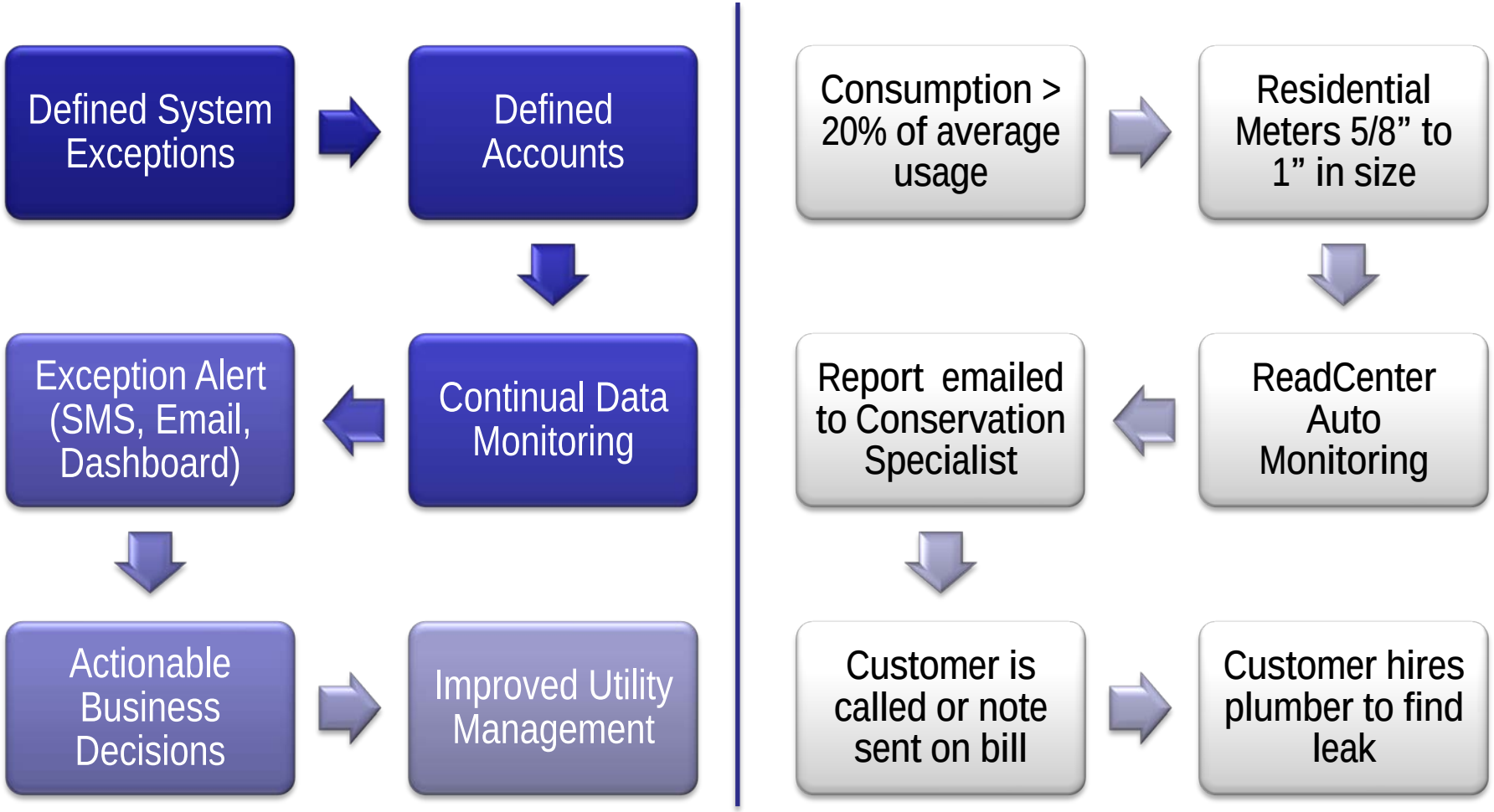
- Most fixed networks despite the technology, allows a utility to remotely collect large amounts of raw metering “data” - Now what?
- Hardware alone cannot improve your conservation efforts
- The “real power” of a fixed network is in the ability to systematically organize your “raw” reading data into easy to use and meaningful information.
- Powerful software empowers utilities to make intelligent information driven utility decisions to better manage their daily operations.

PROVIDING PROACTIVE ANALYTICS

- Data Analytics
  - The science of examining raw data with the purpose of drawing conclusions about that information. Data analytics is used in many industries to allow companies and organization to make better business decisions and in the sciences to verify or disprove existing models or theories.
- Proactive Analytics
  - Defining a set of system exception conditions that affect utility operations (system leaks, profile deviations, and maintenance) .
  - Using powerful analytical software, data is continually monitored in real-time to proactively alert (email, SMS text, and dashboard) utility personnel when an exception condition exists.
  - This system eliminates the need to run reports to find exception conditions and allows the utility to make better business decisions.



PROVIDING PROACTIVE ANALYTICS EXAMPLE



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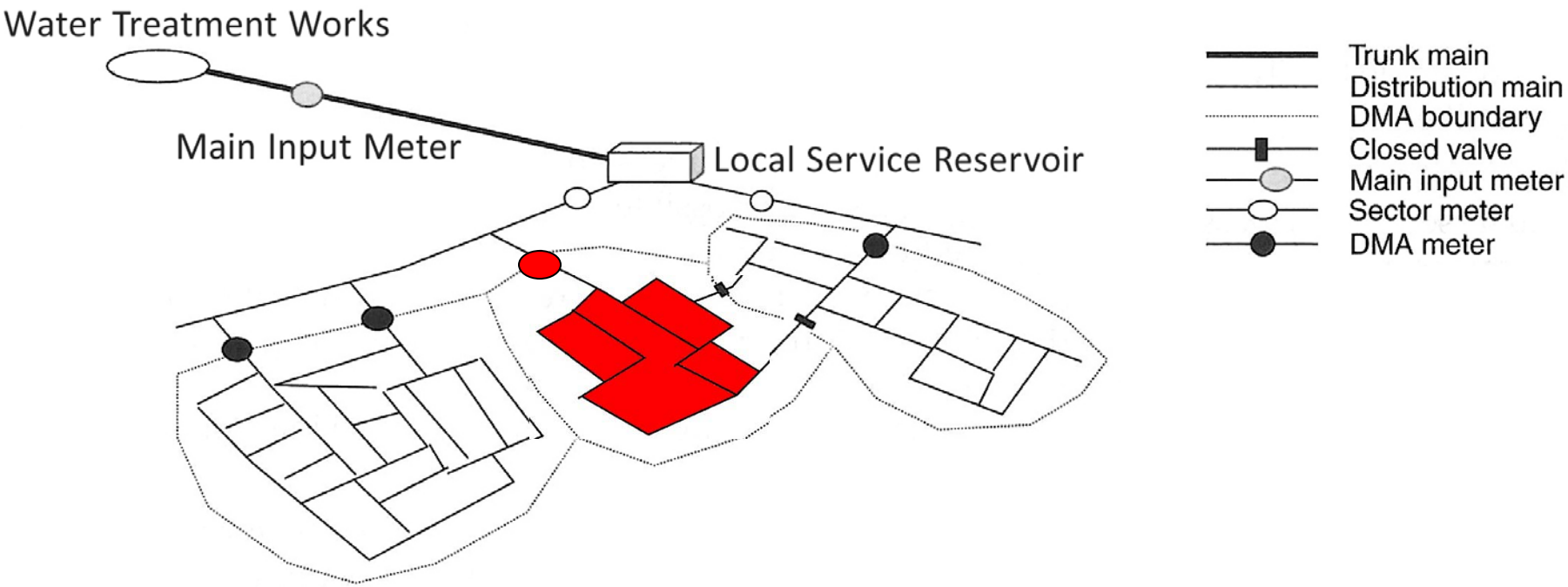
DISTRIBUTION SYSTEM MONITORING

DISTRIBUTION SYSTEM LEAKS

- According to the EPA leakage from water distribution systems costs the nation 1-2 billion dollars annually and this figure grows when taking into account property damage and replacement costs due to infrastructural failures.
- A chronic service line leak on the order of 1 gallon per minute would most likely go unnoticed for years before being found, and would result in the loss of 525 thousand gallons of water per year.
- This water had to be treated and purified to meet drinking water standards, which increases the costliness of leaks.
- Water loss on the level of 10-20 percent is considered normal, but in some areas the aging infrastructure is losing 50 percent of water distributed.

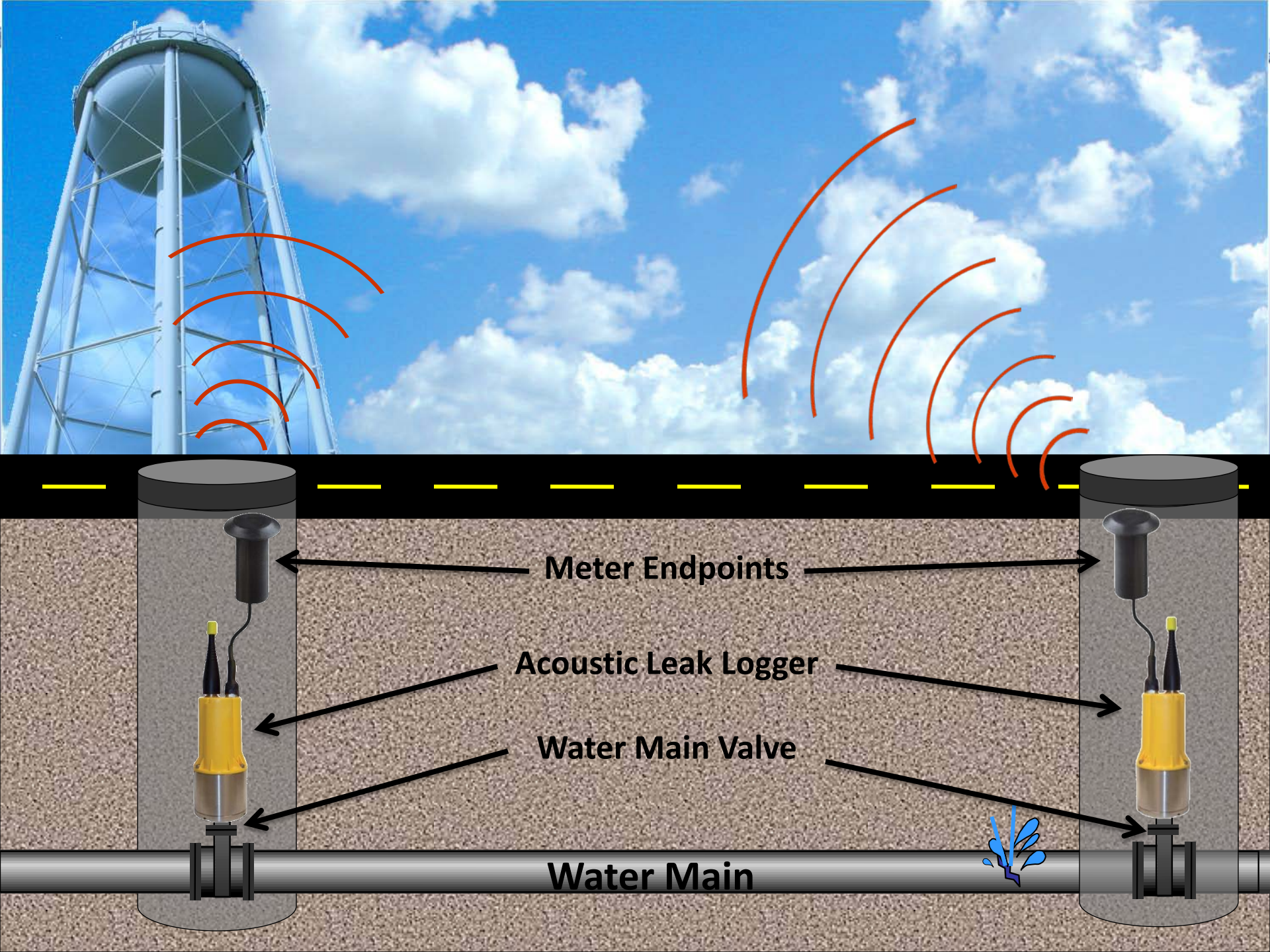
DISTRICT METERING AREA COMPARISON



- DMA Master Meter Measurement = 1,000,000 gallons
- DMA Aggregate Measurement (1,500 Homes) = 890,000 gallons
- Water Loss = 110,000 gallons or 11%
  - Software allow selection of Master Meter and Aggregate Meters and performs calculation
  - Water Loss can come from distribution leaks, inaccurate meters, authorized and unauthorized non-metered consumption

AMI & SYSTEM LEAK DETECTION

- Water fixed network AMI manufactures have teamed up with the leaders in the leak detection industry, to make distribution system leak detection an integral part of everyday meter reading
- How do they work?
  - The loggers are deployed on the water main valves or at the consumers home and establish a baseline of noise in the system
  - The loggers monitor the distribution system for acoustic noise “leaks” during the night time hours when the system is in its most “quiet” state.
  - If the logger senses a nearby water leak (acoustic vibration) in the distribution system, it sends this data to the connected metering endpoint, which in turn broadcasts this important leak data in its reading field.
  - Normally a leak is picked up between two loggers, which allows the utility to understand the general vicinity of the leak (Leak Surveying).


Meter Endpoints
Acoustic Leak Logger
Water Main Valve
Water Main

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CONSUMER SIDE LEAKS

CONSUMER SIDE LEAKS - ACCORDING TO THE EPA

- Leaks can account for, on average 10,000 gallons of water wasted in the home every year, which is enough to fill a backyard swimming pool.
- The amount of water leaked from U.S. homes could exceed more than 1 trillion gallons per year. That's equivalent to the annual water use of Los Angeles, Chicago, and Miami combined.
- Ten percent of homes have leaks that waste 90 gallons or more per day.
- Common types of leaks found in the home include leaking toilet flappers, dripping faucets, and other leaking valves. All are easily correctable.
- Fixing easily corrected household water leaks can save homeowners more than 10 percent on their water bills.

CONSUMER SIDE LEAKS – AMI SOLUTION

- Leak Indication In AMI Fixed Networks
  - Metering endpoints report leak detection when flow is measured during every two-hour period for twenty-four consecutive hours
  - Continually look for at least one or two hours of no usage
  - The system automatically resets when the next two-hour window of no usage is found
- Utility Application of Data
  - Leak notification statement on consumer bill assists in billing disputes
  - Email notifications of leaks

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CONSERVATION PROGRAM VALIDATION

WATERING RESTRICTION MONITORING

- Sprinkler / Watering Day Restrictions
  - Fixed Network system allows for restriction profile to be applied to selected account
  - Reading Data Management monitors applied conditions through hourly interval data and alerts utility if restrictions are not followed
  - Utility personnel can be notified via SMS Text, email, or dashboard
  - Consumer can be notified of condition as well via SMS Text or email

CONSERVATION PROGRAM ANALYSIS

- According to the EPA, showering is one of the leading ways we use water in the home, accounting for nearly 17 percent of residential indoor water use, or about 30 gallons per household per day(1.2 trillion gallons annually in U.S.)
- The average household could save more than 2,300 gallons per year (21%) by installing low-flow showerheads.
- Water utilities around the country are actively promoting water conservation through the use of low flow devices such as showerheads, toilets, faucets, etc.
- How do they measure the effects of these aspects of their conservation program?

MEASURING CONSERVATION PROGRAM EFFECTS

- Select Target Neighborhood Accounts
- AMI System Software provides consumption percentage calculations:
  - Usage for prior period: 250,000 gallons
  - Usage for same time period following the implementation of low flow devices: 200,000
  - An actual reduction of 21%
- Customer facing web portal provides
  - Number of leak occurrences for prior period: 17 out of 100 homes

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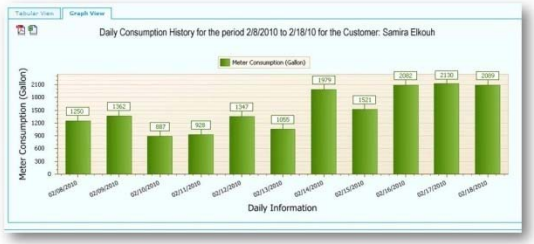
BENEFITS OF CUSTOMER WEB PORTAL

BENEFITS OF A CUSTOMER WEB PORTAL

- Studies have shown that people are more apt to make a real and permanent change in their energy and water consumption if they have access to near real-time consumption usage
- Web portals assist a water utility by providing:
  - Proactive customer notifications regarding leaks
  - Customer buy-in to utility conservation efforts such as Budget or Reduction Plans
  - Customer understanding of everyday usage (how much water is used and what it costs to water their lawn)



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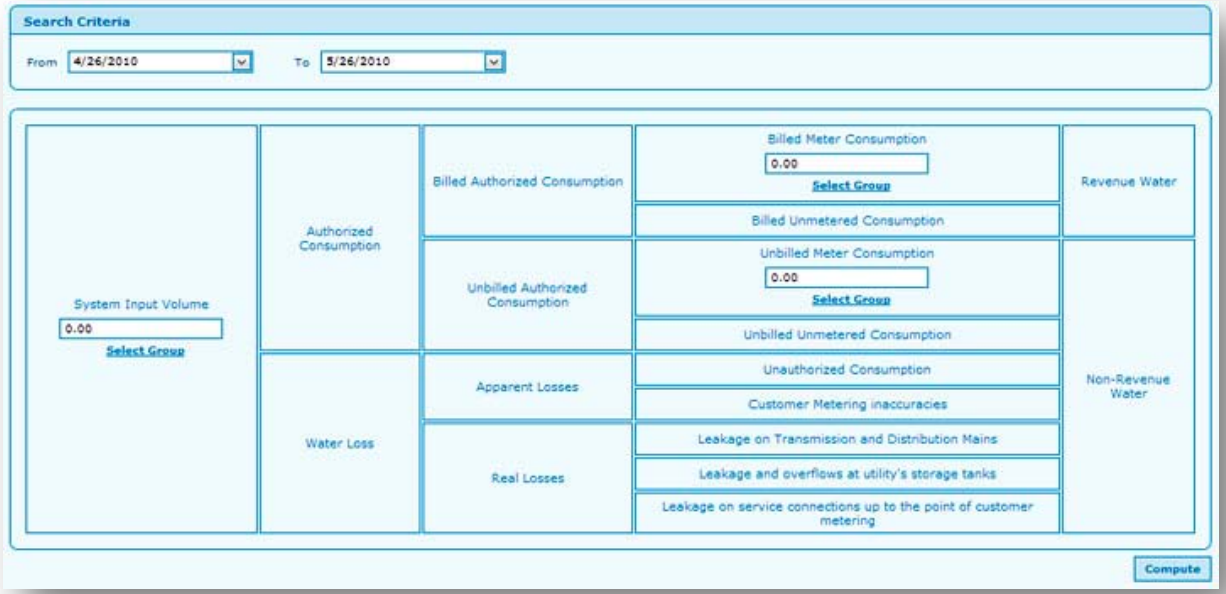
AWWA/IWA WATER BALANCE AUDIT

AWWA / IWA WATER BALANCE AUDIT

- Select accounts and time period for metering aspects of audit
  - System Input Volume
  - Billed Metered Consumption
  - Unbilled Meter Consumption



QUESTIONS / ANSWERS / DISCUSSION