SmartAmerica Challenge

Presented by

QUALCOMM® CH2MHILL®

June 10 & 11, 2014

Agenda

- Introduction of the issue
- Video
- PWD/SFPUC case studies
- Saipan Case Study
- Cincinnati Case Study
- Policy Considerations

Acknowledgement

U.S. Bureau of Reclamation

U.S. Environmental Protection Agency
Water Security Division

U.S. Environmental Protection Agency
Region IX

Cincinnati Metropolitan Sewer District

Philadelphia Water Department

San Francisco Public Utilities Commission

Central Northern Mariana Islands

Water connects us, much like technology

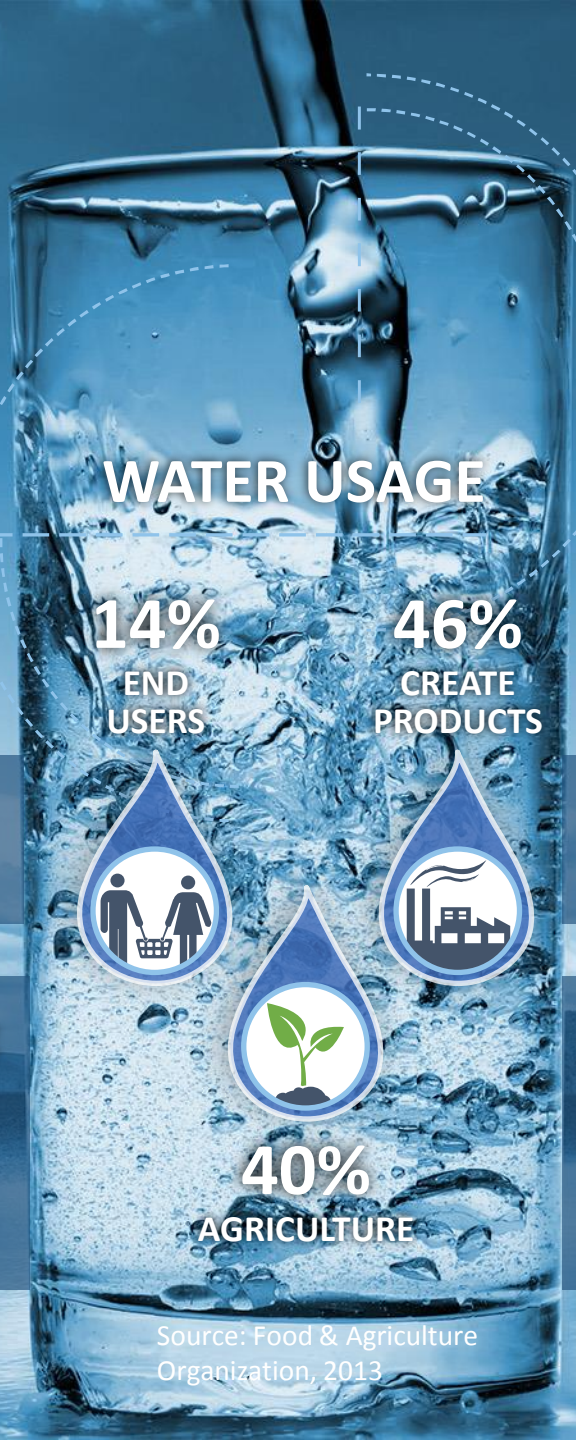
- M2M technology can help water utilities efficiently and effectively manage water resources
- Represents a step change in how water resources are managed to affect real environmental impact on economic growth

The Value of Water

> *Driven by this heightened competition, the* ***economic value of water will rise,*** *and decision-makers in both the private and the public sectors will need information that can help them maximize the benefits derived from its use.*
>
> – U.S. Environmental Protection Agency

$400B global industry, third largest behind electricity and oil & gas*

Without investment, ASCE estimates deteriorating water infrastructure will cause American businesses to lose **$734B** in sales between now and 2020, with loss of GDP**



*Source: General Electric, 2007
**Source: ASCE, 2013

The Value of Water

To wash one load of laundry in older machines **50 GALLONS**

The Value of Water

To grow one apple **19** GALLONS

50 GALLONS

The Value of Water

19
GALLONS

50
GALLONS

To make
one T-shirt **700**
GALLONS

The Value of Water

19 GALLONS

50 GALLONS

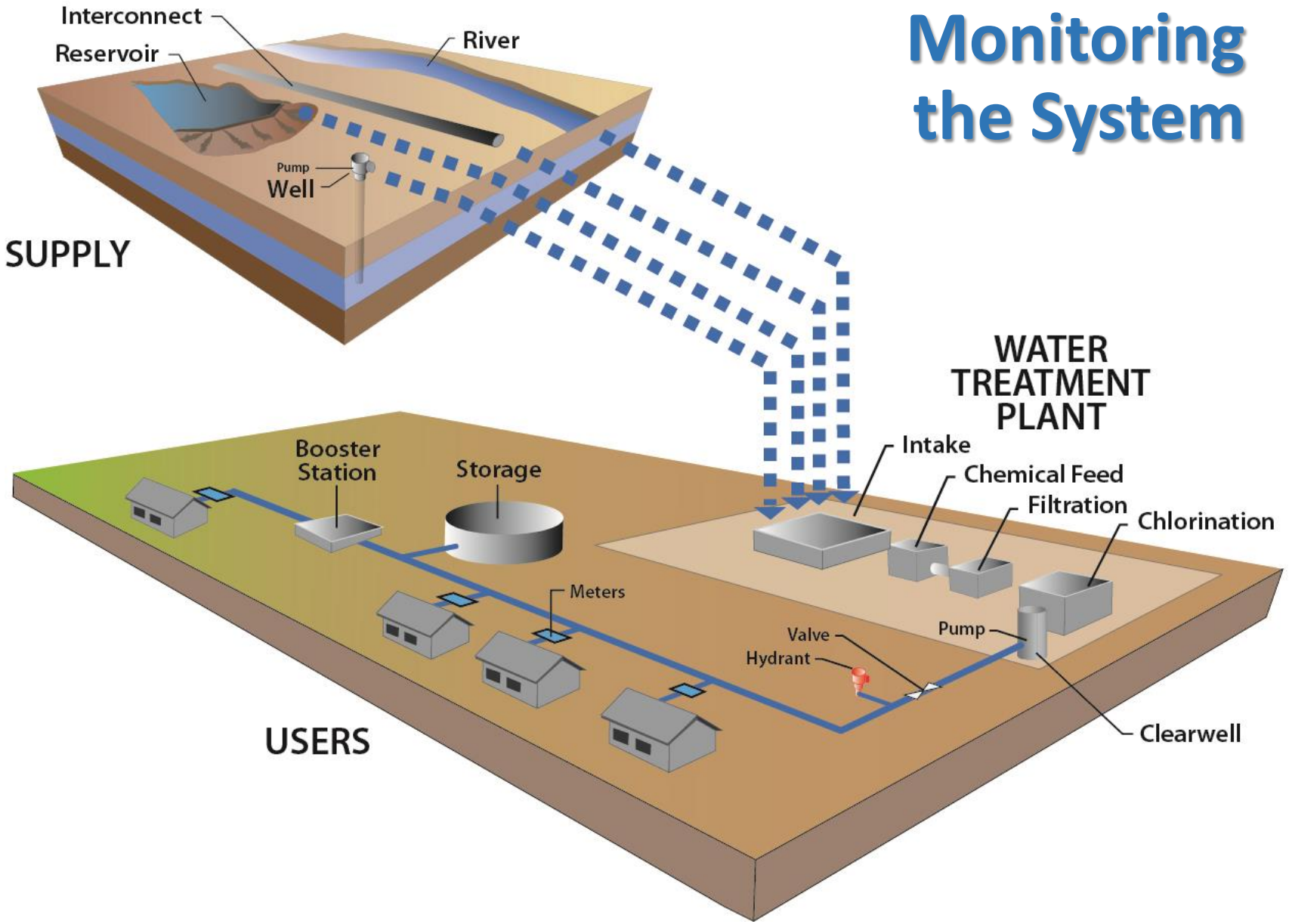
700 GALLONS

To manufacture one car **40,000** GALLONS

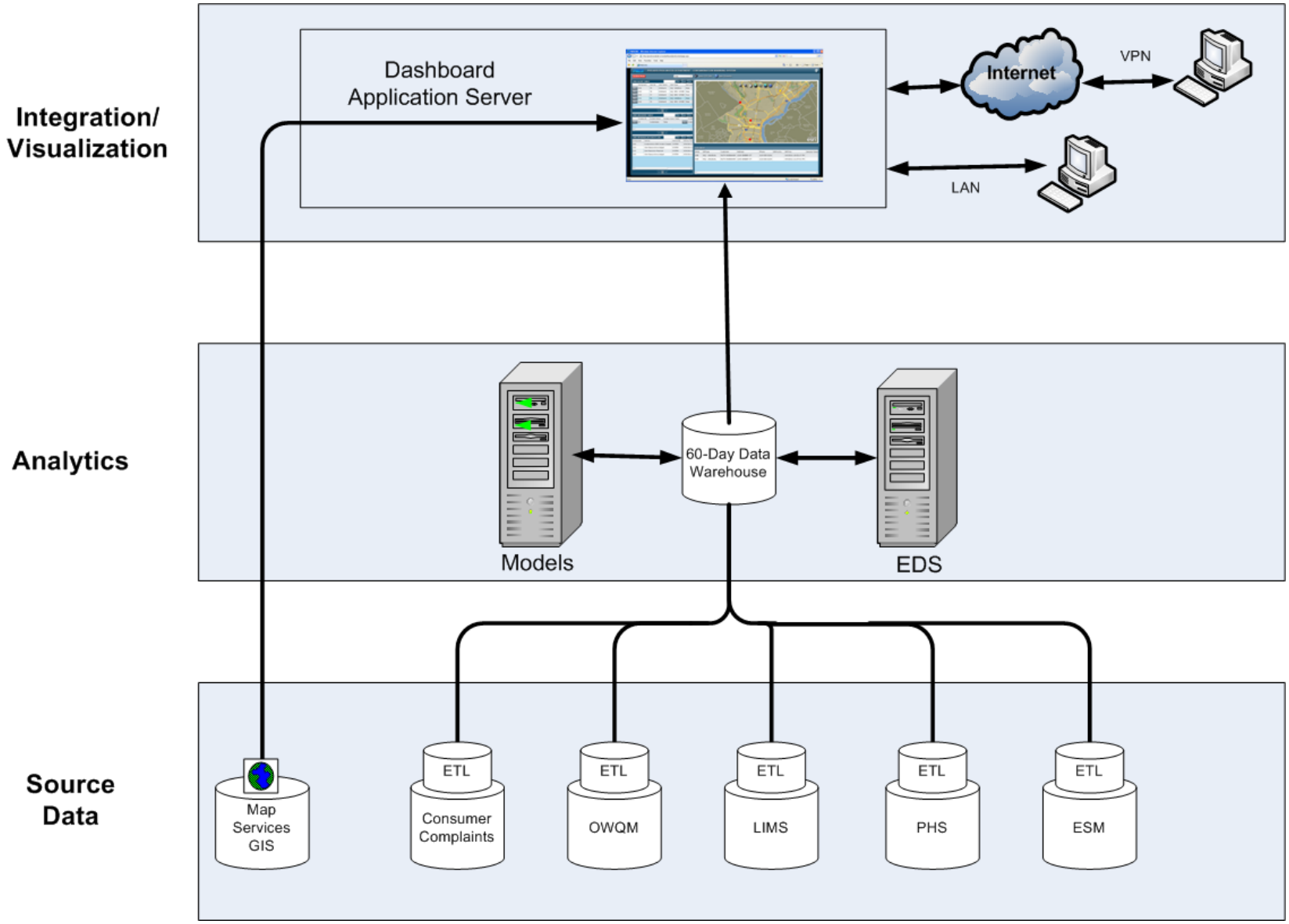
*Source: EPA, 2012; Science Media Center, 2009; USGS, 2013; WWF, 2013.

Video

Monitoring the System



Water Quality System Architecture



Benefits of Intelligent Water Technology

DROUGHT
Reduce water loss from leaking pipes, theft, sewer overflows

ECOLOGY
Contamination events and future disasters

PEOPLE
Investment in water infrastructure to create jobs and transform the aging workforce

ENERGY
Savings

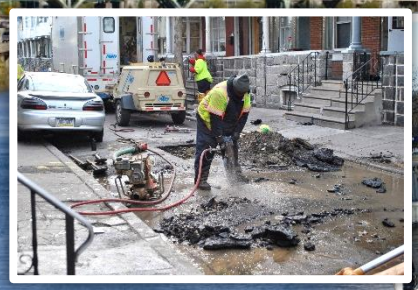
- Improved Water Quality
- Increased Water Supplies
- Reduced Cost Of Resource Management

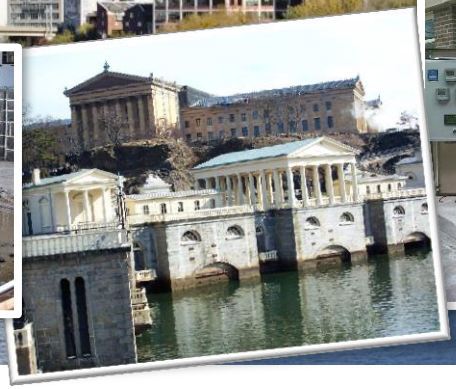
Without investment, U.S. will lose 700,000 jobs by 2020 and 1.4 million jobs by 2040

Investing in Water Means Economic Growth

Project Snapshot: Philadelphia

Philadelphia Water Department





- Serves 1.6 million customers
- CWS integrates data sources, produces real-time, actionable information to give operators information about what's happening throughout the water system
- Real-time data analysis protects public health and improves water quality

PWD Surveillance and Response System

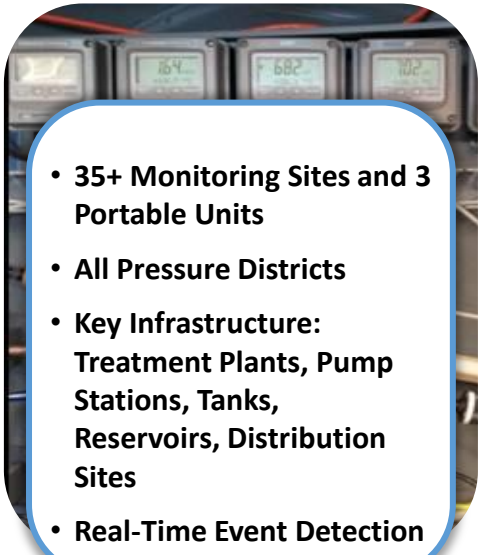
Sampling and Data Analytics

- Data Integration and Laboratory Analysis
- Event Detection
- Alert Generation and Notification
- Hydraulic Modeling
- Baseline Monitoring and Routine Sample Collection
- Field Screening and Site Characterization

Response and Consequence Management

- Alarm Response
- Communication and Planning
- Sample Collection and Analysis
- Risk Communication and Remediation
- Communication
- Incident Command
- Standard Operating Procedures
- Public Relations and Notification

Online Water Quality Monitoring



- 35+ Monitoring Sites and 3 Portable Units
- All Pressure Districts
- Key Infrastructure: Treatment Plants, Pump Stations, Tanks, Reservoirs, Distribution Sites
- Real-Time Event Detection

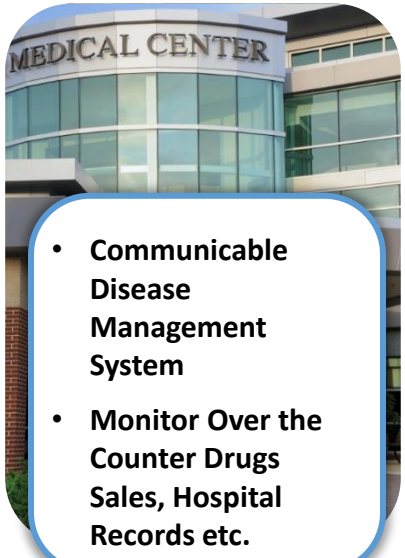
Customer Complaint Surveillance

- 1.6 Million Customers (Human Sensors)
- Work Order Management System with GIS Integration
- Event Detection Algorithms

Enhanced Security Monitoring

- Enhanced Detection and Surveillance Technology at Key Sites

Public Health Surveillance



- Communicable Disease Management System
- Monitor Over the Counter Drugs Sales, Hospital Records etc.

Investing in Water Means Economic Growth

Project Snapshot: N. Mariana Islands

Commonwealth Utility Corporation, Saipan

- Serves 40,000 people in Saipan, and another ~8,000 in Tinian and Rota
- Imagine your life without access to water 24/7 – that's the reality for 15% of the people living in Saipan, a U.S. territory in the Northern Mariana Islands
- Water only flows through pipes 2-3 hours each day
- Undrinkable High Salinity water must be used because too much of the good quality water is lost
- Utility faces 70% water loss due to leaking pipes and theft
- 6-7x higher energy costs exacerbates water-energy nexus

Investing in Water Means Economic Growth

Project Snapshot: N. Mariana Islands

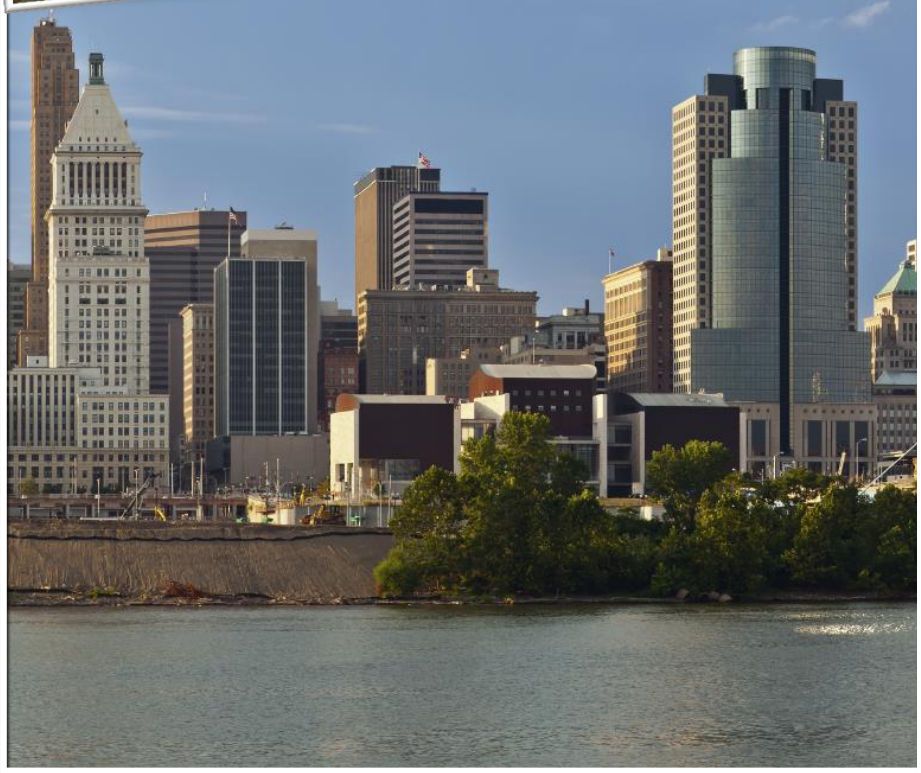
Commonwealth Utility Corporation, Saipan

- With median income 45% below U.S. average, residents are falling off the water grid due to high water costs
- M2M technology is the solution and by installing cellular based meters and pressure sensors across the water system, Saipan will be able to conserve water and save $700K by reducing water loss just 10%
- Investing in the water system will transform the island, fuel economic growth and improve sustainability

Investing in Water Means Economic Growth

Project Snapshot: Cincinnati

Greater Cincinnati Water Works and Metropolitan Sewer District



- Joint water, sewer and stormwater utility serving a regional population of over 1.2M people
- $68-105 million over 10 years by combining business and administrative services between utilities
- Offers municipal services to other municipalities over technology platform using a “public-private-public network” business model
- Early adopter of M2M technology and leader in transformative utility optimization practices
- Leverages digital technology and automation to addresses aging workforce, infrastructure and climate change challenge faced by the water sector
- Current technology innovation initiatives and various partnership will lead to development of an integrated water system capable of collecting and processing data throughout the water distribution system and watersheds in real-time for real time decision making

Questions?

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