

# How do we keep the water flowing in our Cities – Utilizing Smart Technology

Presented by:

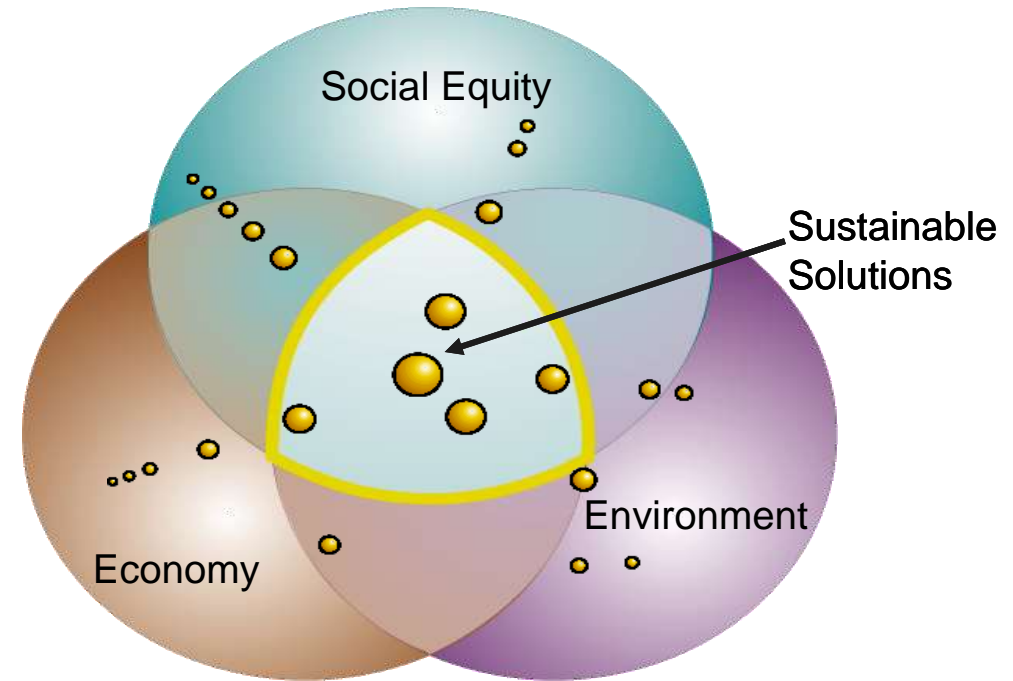
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# Balancing Cost and Benefits

- Focus on balancing costs and benefits (triple bottom line) will increase due to high energy demands for many advanced treatment options
- Alternative selected for project implementation should support the most sustainable approach

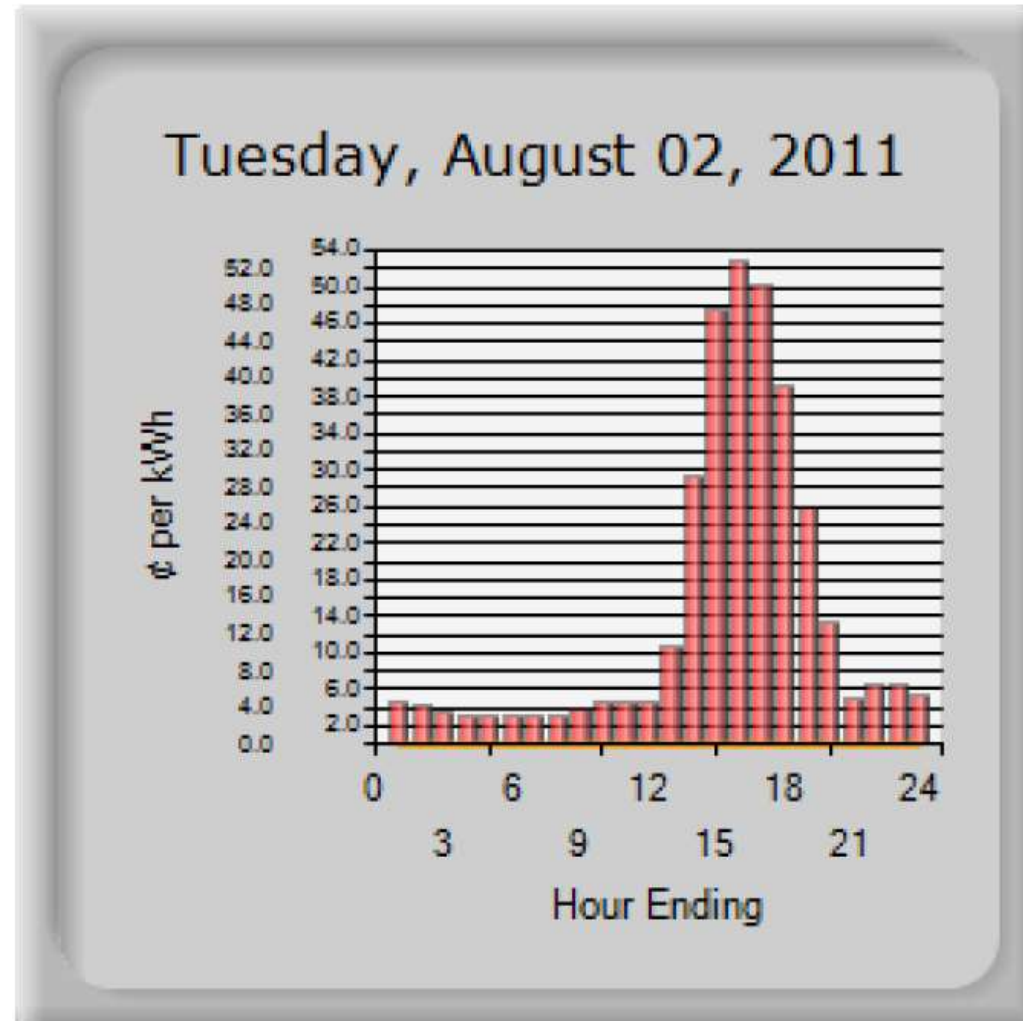


# Real-time Energy Optimization

# Real-Time Energy Optimization

- Interfaces directly to existing SCADA with minimal equipment, instrumentation or hardware changes
- Operational tool to schedule pumps/valves to achieve lowest overall cost (without breaching constraints)
- Solves mass-balance first (i.e. must deliver water)
- Aims to minimize costs of energy (best use of off-peak rates)
- Aims to maximize energy efficiency of pumps (BEP)
- Can improve water quality by managing turnover
- Runs in real time – Like an autopilot
- Recalculates schedule (next 24-48 hours) every 1/2-hour, adapting to changing conditions of the day
- Energy Management and Operations Optimization System

# Take Advantage of Real-Time Energy Pricing



# Real-Time Water Quality Monitoring

# Traditional Practices in the Industry

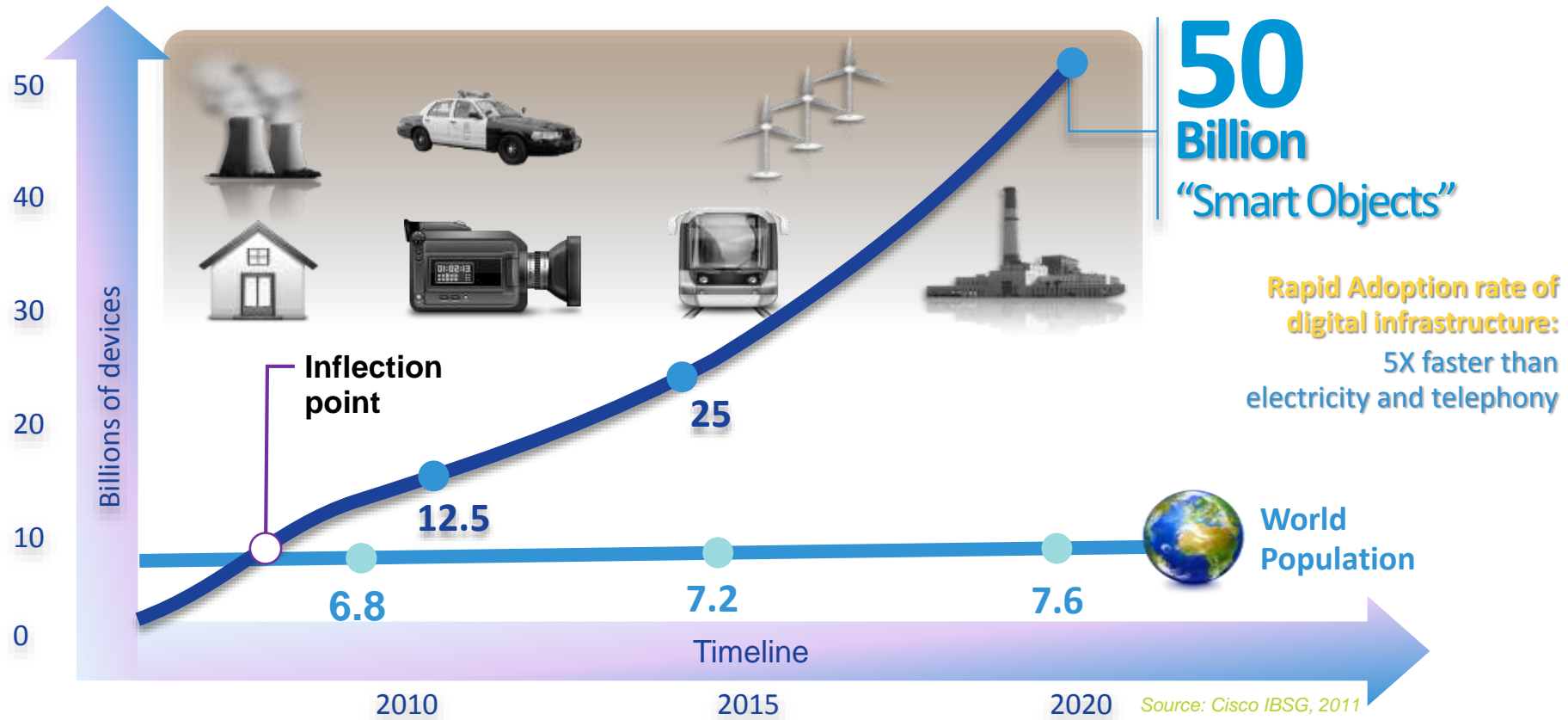
- Approach to water quality complaints are often handled with a single grab sample and spot flushing
  - Did that really solve the problem or just move the problem down stream?
  - Regular system flushing and identifying hot spots for more frequent flushing significantly reduces customer calls
- Distribution system water quality is associated with weekly to monthly compliance grab samples
  - Does a single grab sample from a couple of seconds of flow really reflect what is happening between sampling events
  - Wouldn't it be nice to understand what is happening throughout the day in key parts of your system?

# Traditional Practices in the Industry

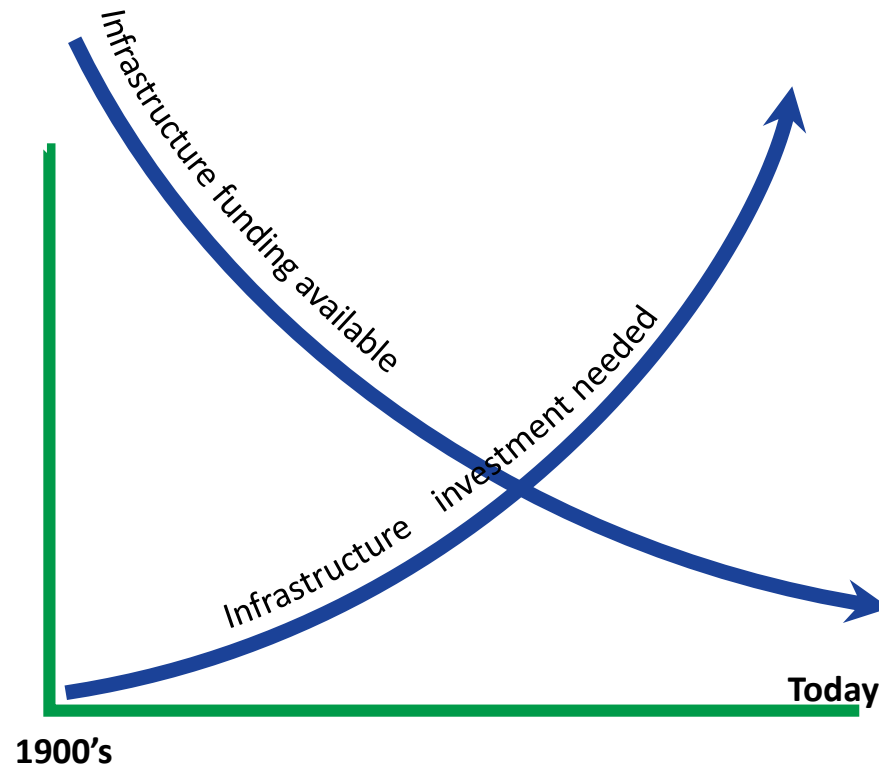
- When customers do not call and complain about pressure and quality is everything okay?
  - AWWA surveys suggest that at best 1 in every 100 customers will call about a problem. Why, people do not like conflict, but they will talk to their friends and use social media.
  - There are tools that allow social media mining that identifies key words associated with water problems.



# The data revolution has arrived and is being driven by the Internet of Things (IOT)



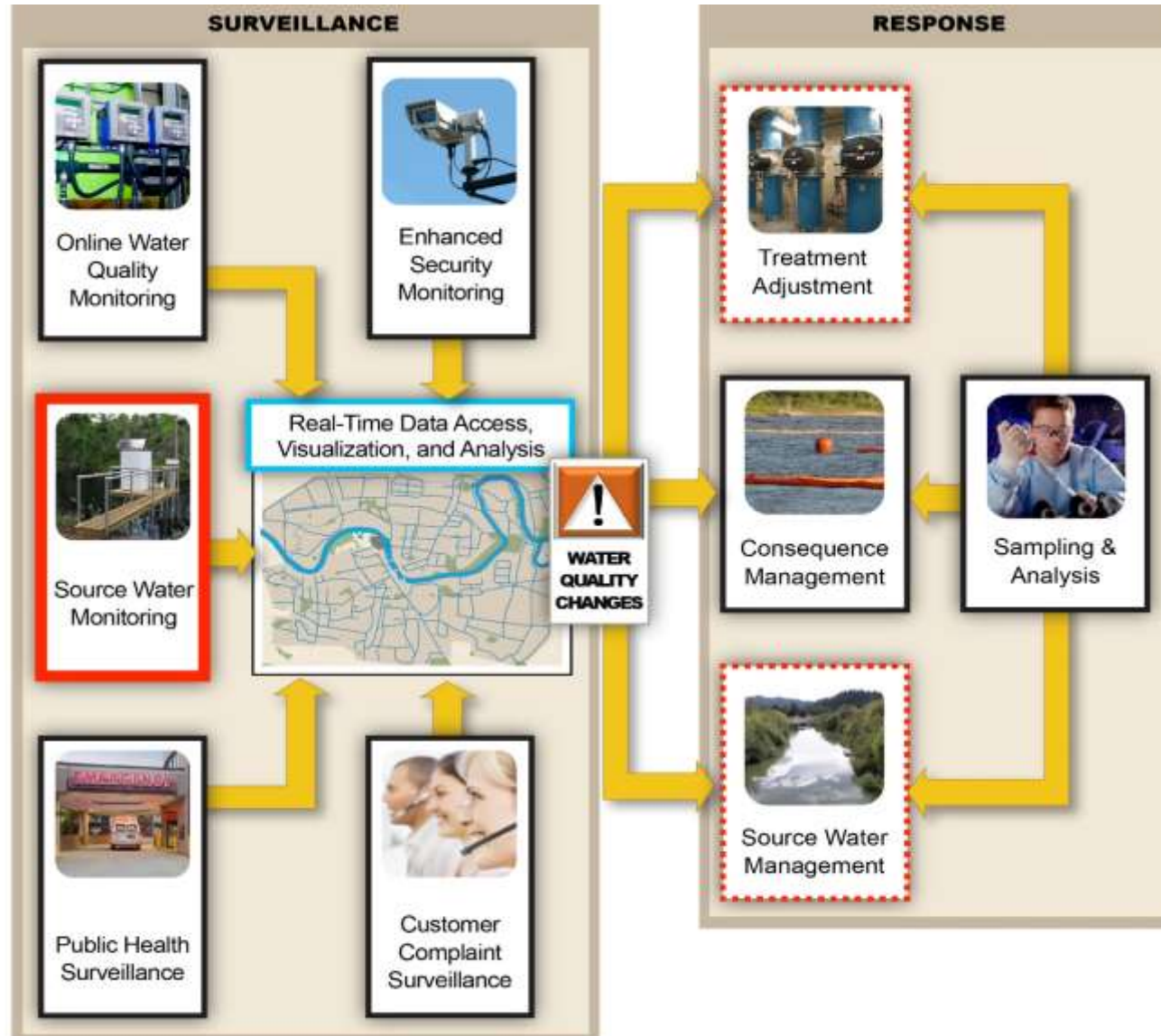
# Water systems become smarter with new disruptive innovations creating a new paradigm shift



Traditional infrastructure funding is shrinking while needed investment continues to grow.

Smart systems will provide new information for focused replacement and system optimization

# Surveillance and Response System Architecture



# Philadelphia Water Department Dashboard

**PHILADELPHIA WATER DEPARTMENT - CONTAMINATION WARNING SYSTEM (v1.1)** Welcome: AnyBody  
Log Out

**Incident Mode** TOOLBOX  Pressure Districts  Customer Complaints  Public Health  
 Sampling / Analysis  Online Monitoring  Enhanced Security [Documents](#) [Edit ICS](#) [View ICS](#)

CWS ALERT TABLE						
	Alert Time	Component	Alert ID	Alert Name	Alert Type	Alert Status
Edit...	8/30/2012 7:35:59 AM	CCS	469	Leaky_HHS_PC	WQ - DISCLOSED	True
Edit...	8/29/2012 7:09:47 PM	OWQM	468	OWQM Alert	OWQM-1104	False
Edit...	8/29/2012 6:01:48 AM	OWQM	467	OWQM Alert	OWQM-1716	False
Edit...	8/28/2012 8:51:49 PM	OWQM	466	OWQM Alert	OWQM-7207	False
Edit...	8/28/2012 8:25:49 AM	OWQM	465	OWQM Alert	OWQM-1104	True
Edit...	8/28/2012 9:03:50 AM	OWQM	464	OWQM Alert	OWQM-1716	True

CWS INCIDENT TABLE					
	Incident StartTime	Incident ID	Incident Name	Incident Action Taken	Incident Status
Edit...	8/30/2012 1:58:30 PM	32	review	False	Log... Ack
Edit...	4/30/2012 8:41:24 PM	31	test	True	Log... Clo
Edit...		30	incidenttest1	True	Log... Ack

**Activity Log** Chat

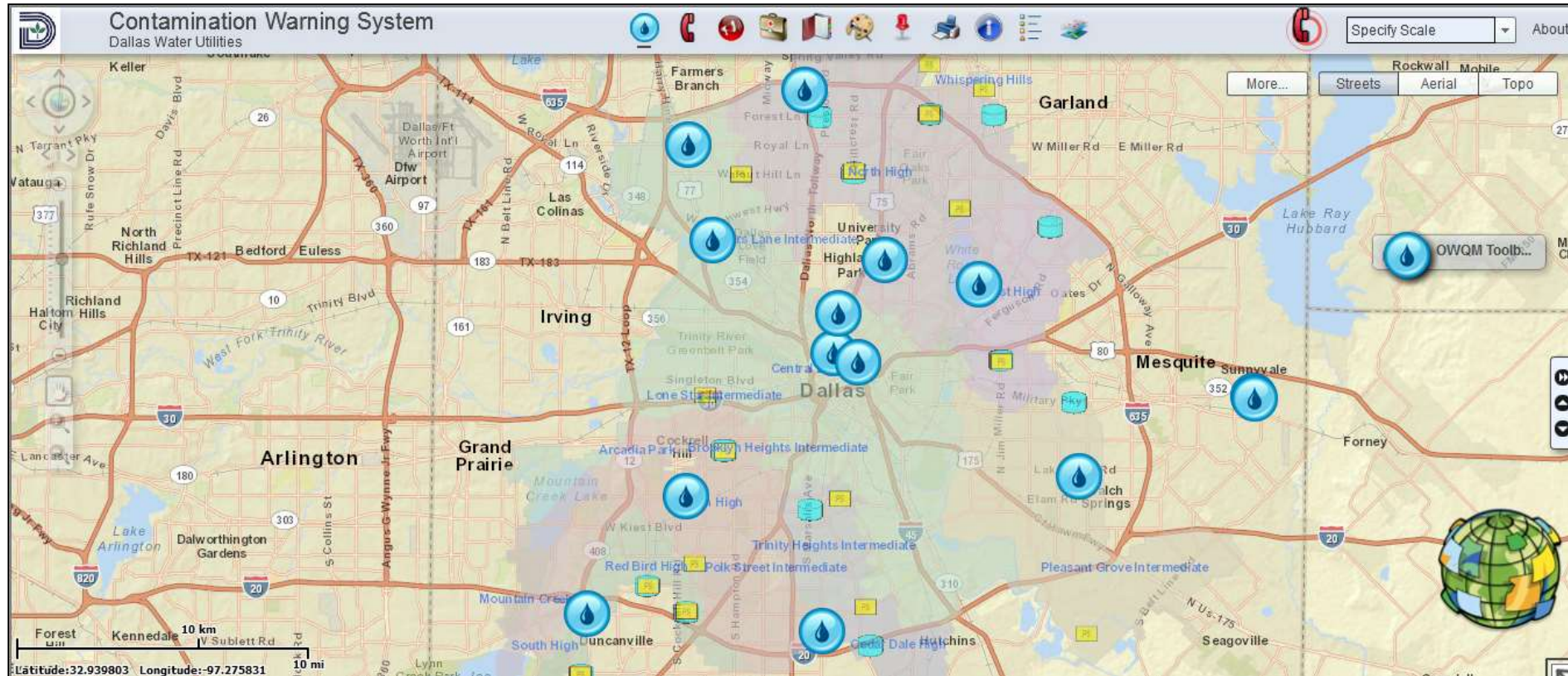
CWS MESSAGE / ACTIVITY LOG		
Component	Activity	Activity By
CCS	Alert Action:Complaint resolved after a hydrant flush in the area	KOPANSKY, MAR
CCS	IncidentAction:EDS Incident Created	SYSTEM
CCS	IncidentAction:test	SKORITOWSKI, J
CCS	IncidentAction:dsde	SKORITOWSKI, J
CCS	Incident Status:Acknowledged	SYSTEM
CCS	Incident Resolution:Credible Incide	SYSTEM
CCS	Incident Resolution:Confirmed Incid	SYSTEM
CCS	Incident Status:Closed	SYSTEM

**CCS Call Detail** OWQM ESM S&A PHS - CDMS & Syndromic

SRID	SRType	Customer	Address	Phone	SRPriority	SRTime	Sample Taken	SRStatus	Pressure District	WT

# Real-time Evaluation of System Water Quality

## Dallas Water Utilities Dashboard



# OWQM at a Quick Glance (Gauge View)



# Transparency – Building Customer Trust and Respect

- Consumer Confidence Report
  - This can be an excellent marketing tool to talk about new programs that your organization is doing to improve or maintain water quality
- Distribution System Flushing Program
  - Turn this into a positive for your customers, even during periods of drought or water shortages: IRWD posted signs 24 hours in advance of flushing operations that read, “Flushing in your area - Keeping our water system clean to maintain the water quality that you deserve”
- Customer Portal
  - Develop an application that provides customers with real-time information about water quality and system status

**Be proactive and bank the customer trust and respect**

# Summary

- In today's world of increasing expectations, change from traditional practices is needed
- Integration of data and converting it into “actionable information” and “knowledge” provides new tools for improving distribution system water quality and customer satisfaction
- Spatial visualization and overlaying disparate data sources helps to create knowledge
- The cost of implementing a smart system does cost money upfront, but experience shows that the ROI can be very significant
- Start engaging your customers now and build the trust and respect.....you never know when you might need it.