NARUC Winter Policy Summit

February 9-12, 2020 · Washington, D.C.

How to Keep Technology Flowing

Making Life Easy for Water Utility Customers

February 10, 2020

Justin Ladner - President, Illinois American Water
Debbie Dewey - President, Missouri American Water
Deron Austin – Director, Water Management Solutions, Mueller
Suzanne Chiavari – Director, Engineering/Resiliency, American Water

AMERICAN WATER

Speakers

Justin Ladner
President
Illinois American Water

Deron Austin
Director
Water Management Solutions
Mueller

Debbie Dewey
President
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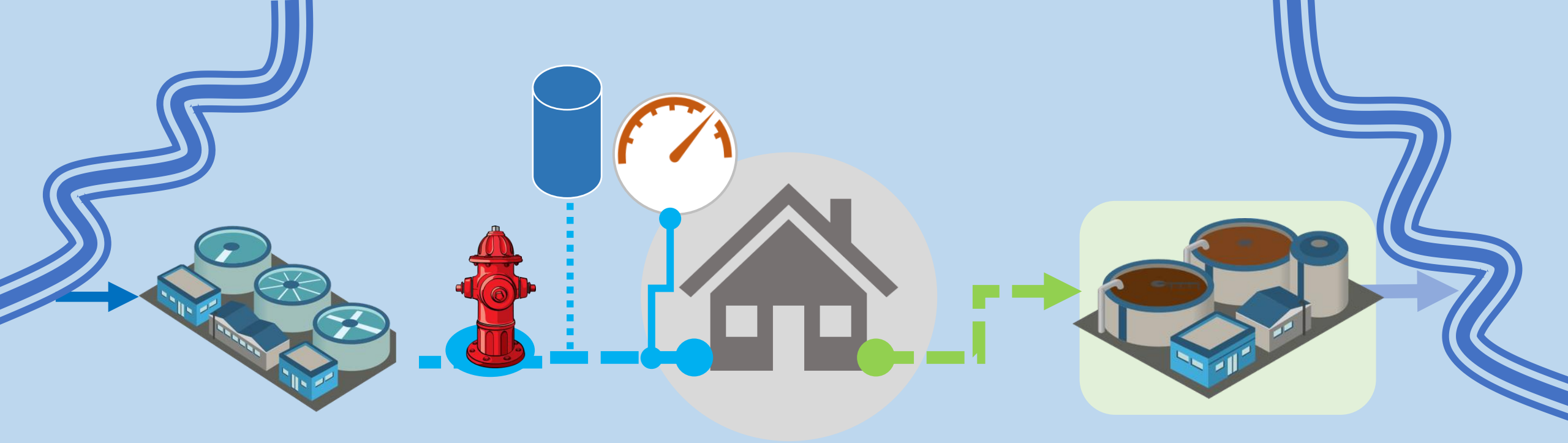
Suzanne Chiavari
Director, Engineering/Resiliency
American Water

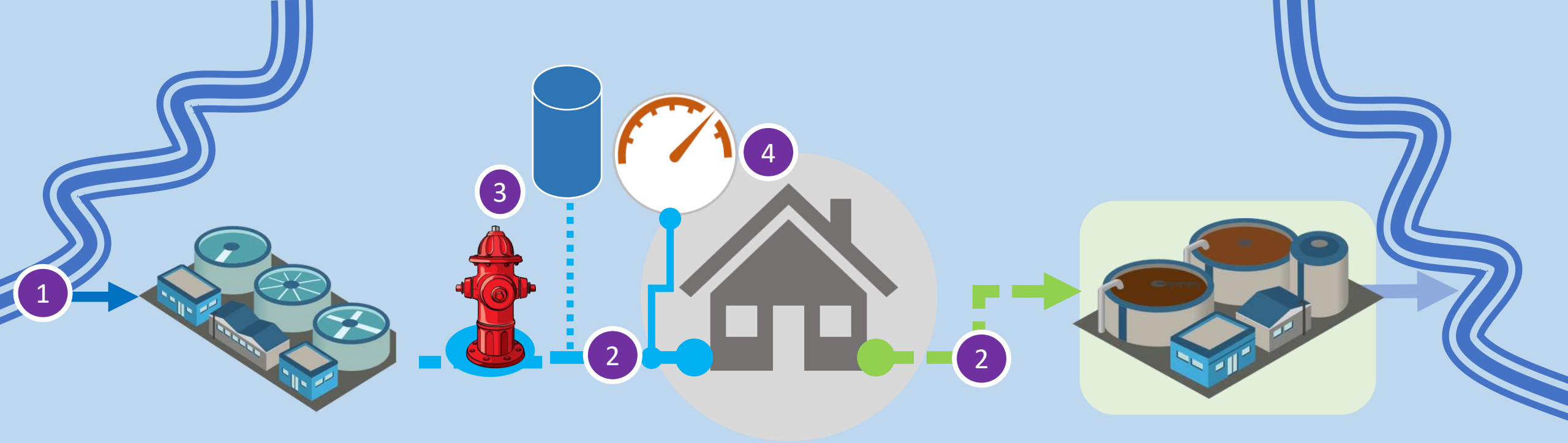

AMERICAN WATER



TECHNOLOGY

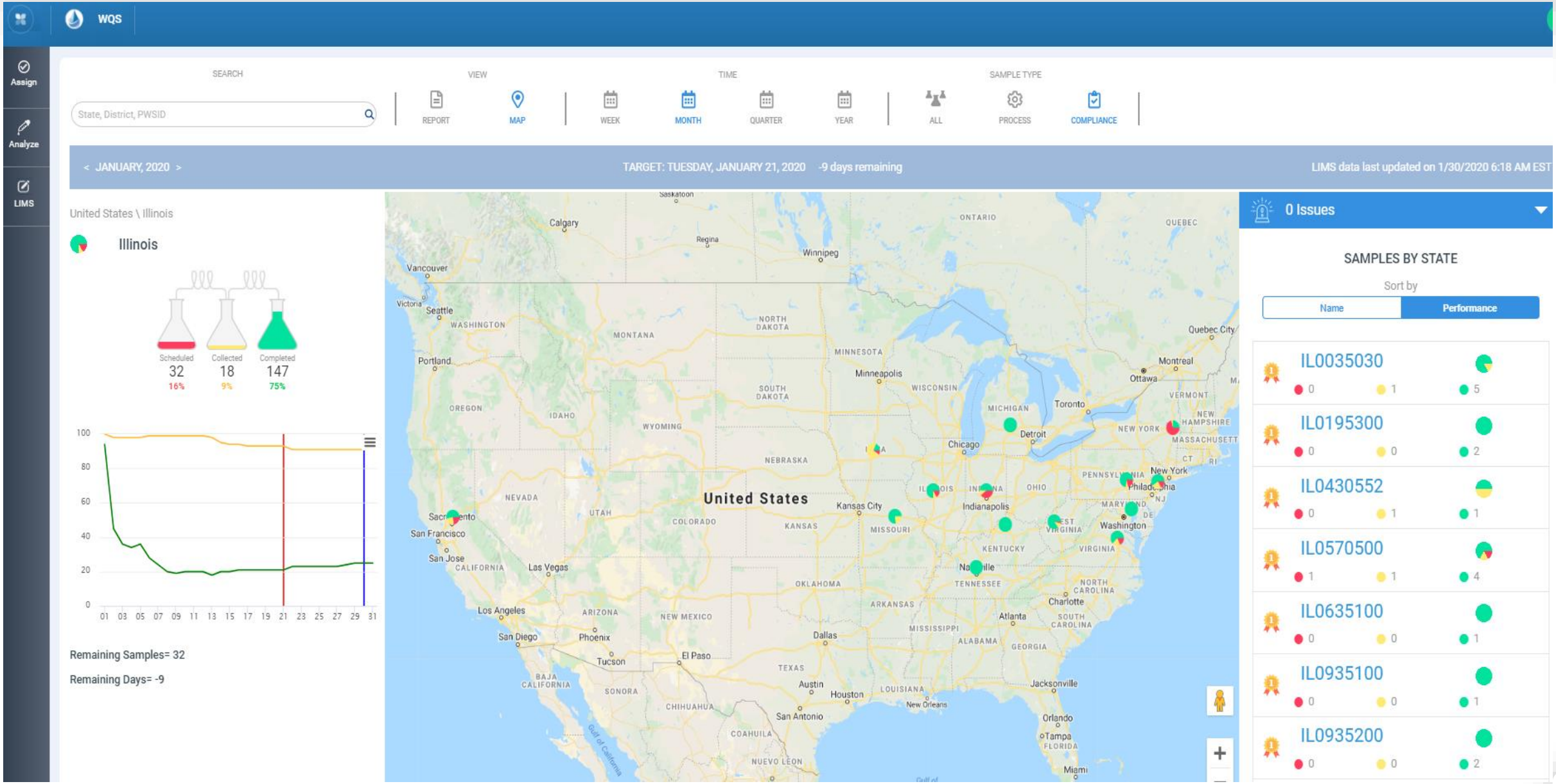
DATA

CUSTOMER EXPERIENCE & COMPLIANCE

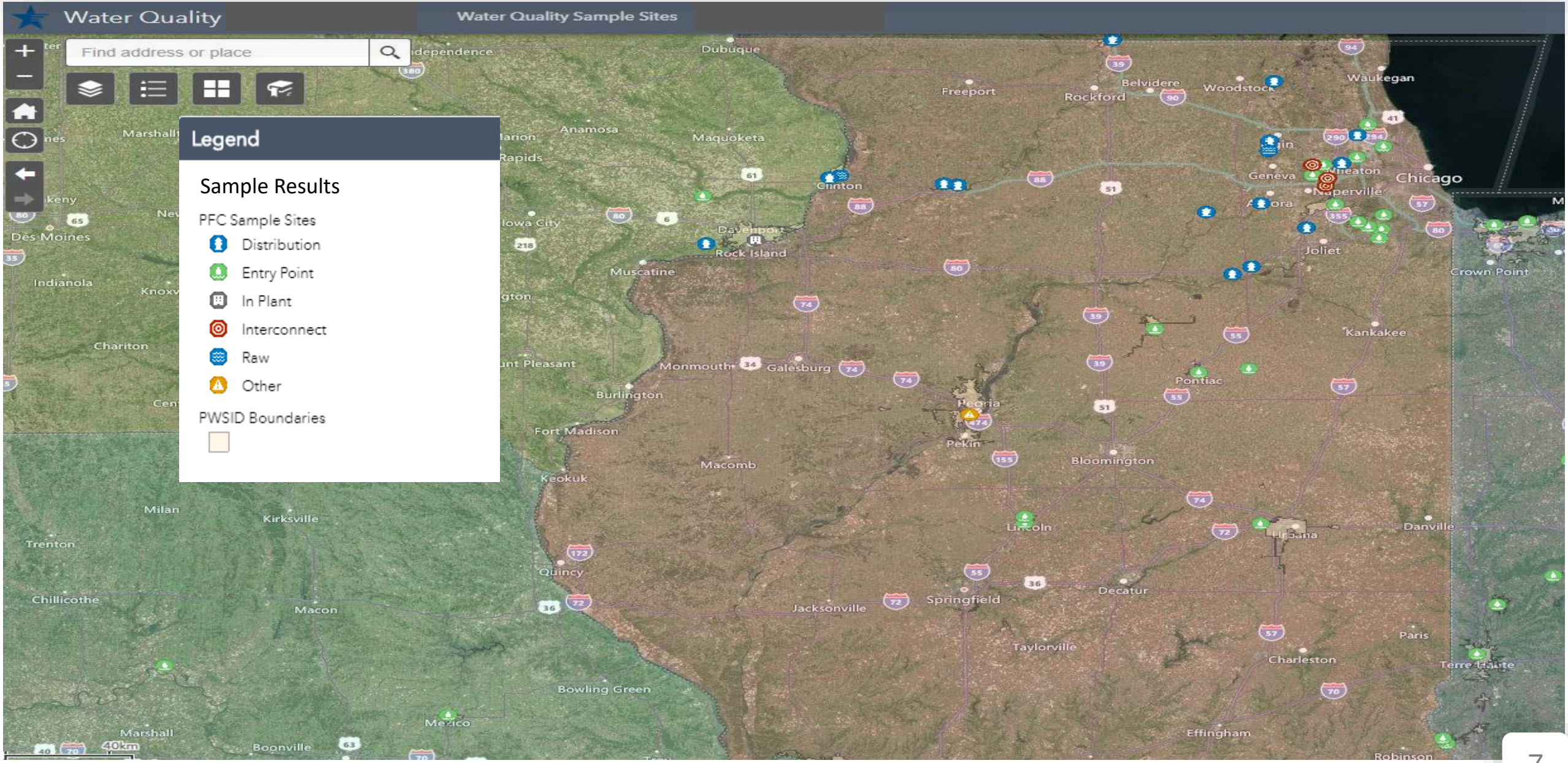


Operational Technologies Improve Customer Experience	
1	**Water Quality Mapping**
2	Workflow Management & Customer Information
3	Smart Distribution Systems
4	AMI Meters
5	Asset Management

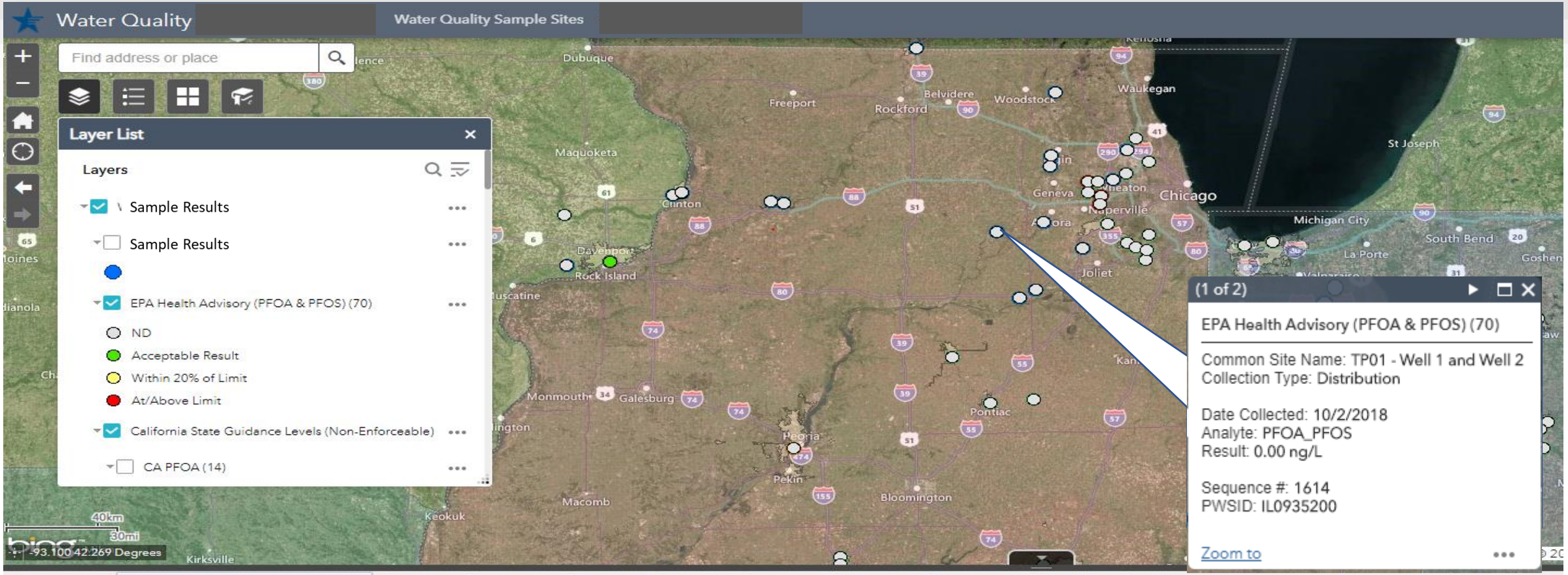
Sample 1View



Geospatial View of Sample Site Types



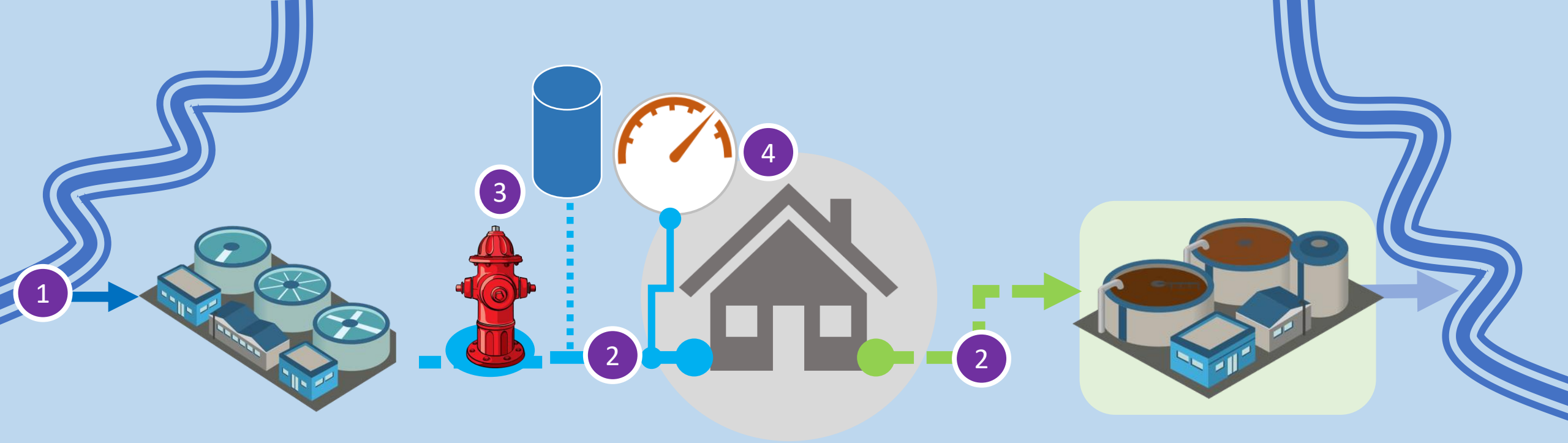
Geospatial View of Sample Results



WQ Analytes | EPA Health Advisory (PFOA & PFOS) (70) | CA PFOA (14) | CA PFOS (10) | MI PFOA (6) | MI PFOS (6) | MI PFNA (6) | MI PFHxS (51) | MI GenX (370) | MI PFBS (420) | MI PFHxA (400000) | NJ PFOA (14) | NJ PFOS (13) | NJ PFNA (13)

Options | Filter by map extent | Zoom to | Clear selection | Refresh

Collected_Date	FREQUENCY	PWSID	Analyte	Result	Units	Qualifiers	Normalized_Result	Normalized_Units	KEYFIELD	X_Coord	Y_Coord
10/2/2018		IL1050650	PFOA_PFOS				0.00	ng/L	10/2/2018 TP02 PROC 416458 10/17/2018	-88.41	40.90
10/2/2018		IL0935200	PFOA_PFOS				0.00	ng/L	10/2/2018 TP01 Well 1 & Well 2 PROC 416445 10/17/2018	-88.59	41.66
10/2/2018		IL0630040	PFOA_PFOS				0.00	ng/L	10/2/2018 TP01 Well 1 PROC 416436 10/17/2018	-88.48	41.36



Operational Technologies Improve Customer Experience	
1	Water Quality Mapping
2	**Workflow Management & Customer Information**
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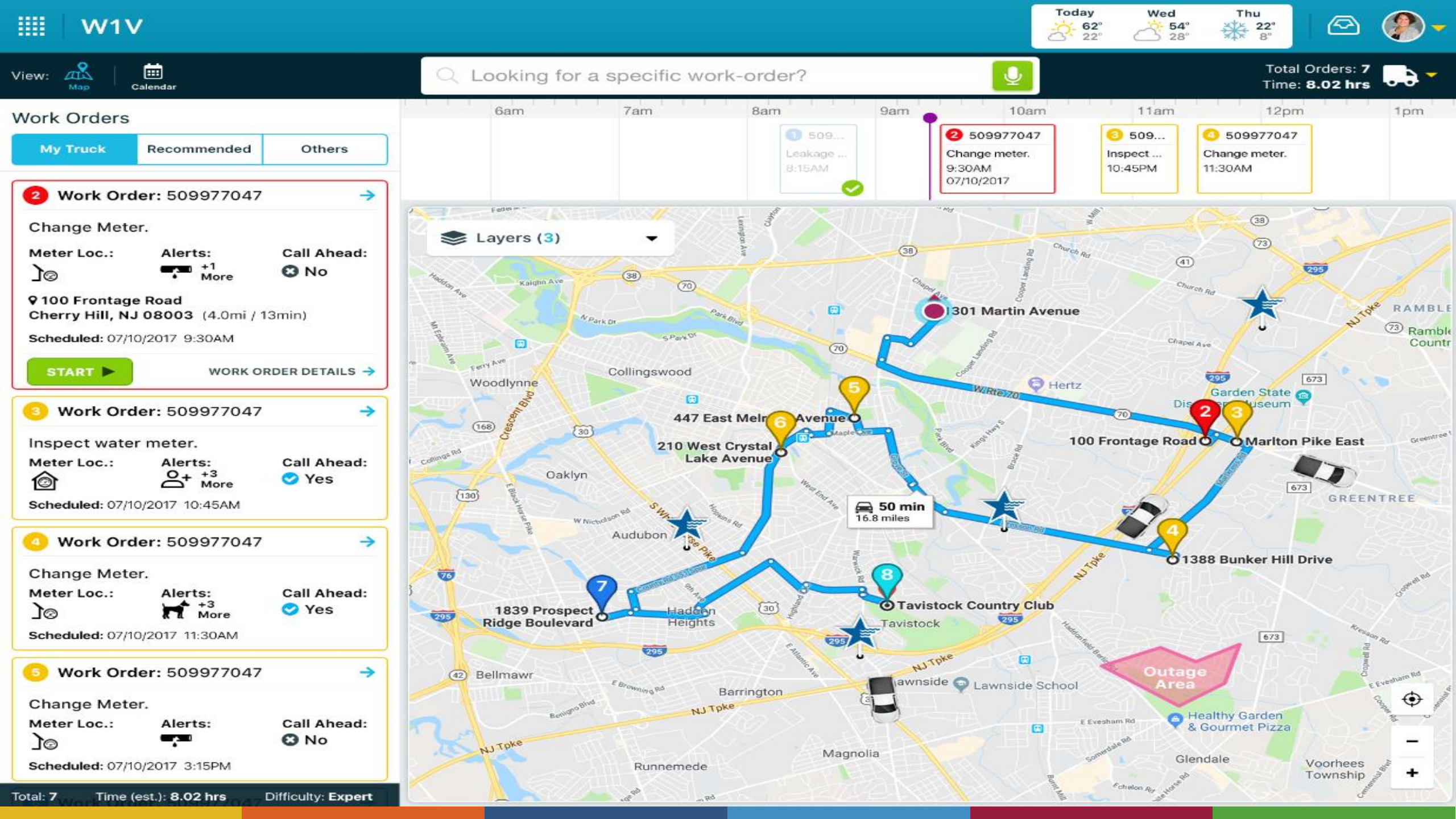
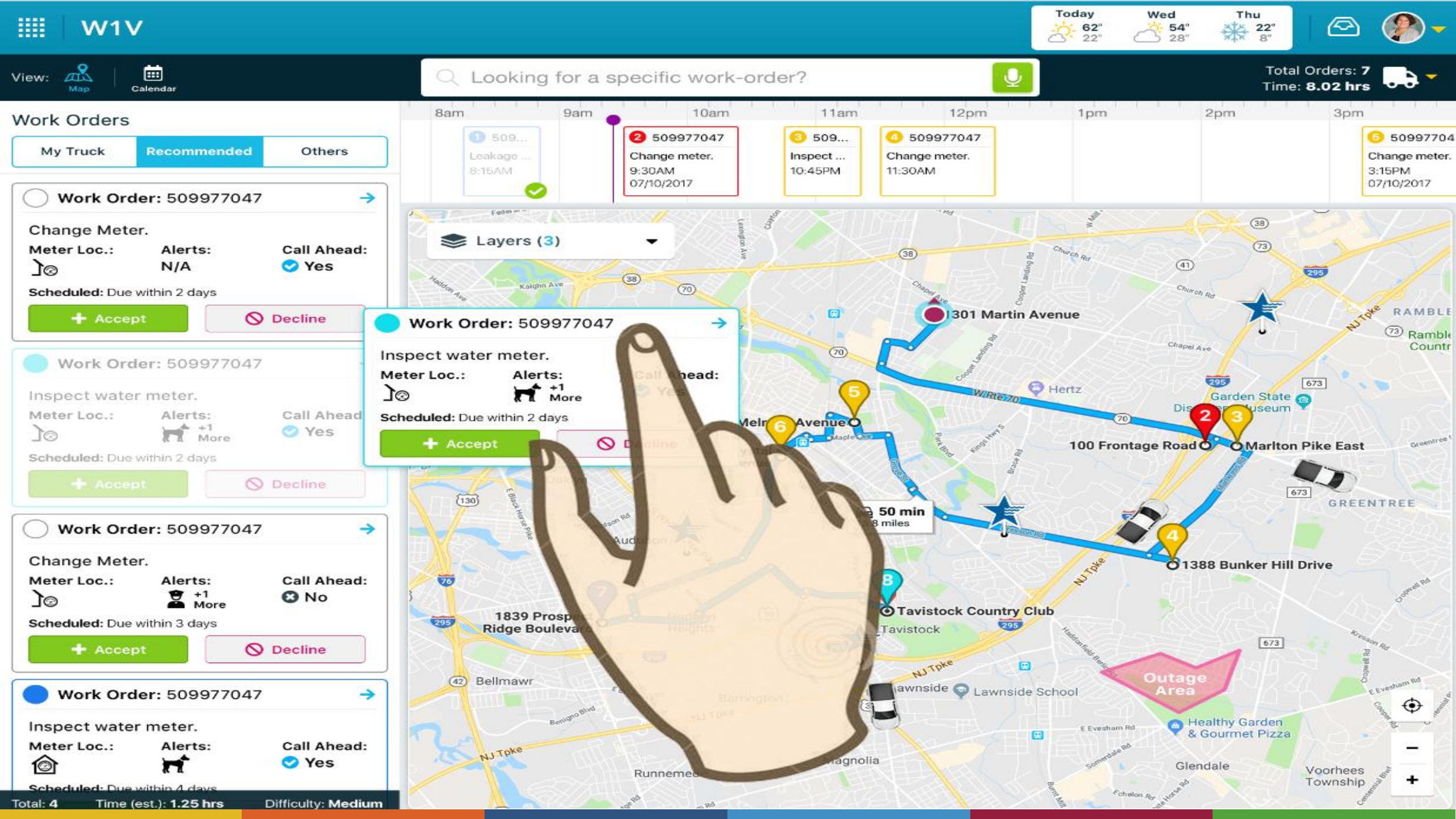
5	Asset Management


W1V
Today 62° 22°
Wed 54° 28°
Thu 22° 8°
View: Map Calendar
Looking for a specific work-order?
Total Orders: 7
Time: 8.02 hrs
Work Orders
My Truck
Recommended
Others
2 Work Order: 509977047
Change Meter.
Meter Loc.:
Alerts: +1 More
Call Ahead: No
100 Frontage Road
Cherry Hill, NJ 08003 (4.0mi / 13min)
Scheduled: 07/10/2017 9:30AM
START
WORK ORDER DETAILS
3 Work Order: 509977047
Inspect water meter.
Meter Loc.:
Alerts: +3 More
Call Ahead: Yes
Scheduled: 07/10/2017 10:45AM
4 Work Order: 509977047
Change Meter.
Meter Loc.:
Alerts: +3 More
Call Ahead: Yes
Scheduled: 07/10/2017 11:30AM
5 Work Order: 509977047
Change Meter.
Meter Loc.:
Alerts:
Call Ahead: No
Scheduled: 07/10/2017 3:15PM
Total: 7
Time (est.): 8.02 hrs
Difficulty: Expert
6am
7am
8am
9am
10am
11am
12pm
1pm
509977047
Change meter.
9:30AM
07/10/2017
509...
Inspect ...
10:45PM
509977047
Change meter.
11:30AM
Layers (3)
1301 Martin Avenue
447 East Melrose Avenue
210 West Crystal Lake Avenue
100 Frontage Road
Marlton Pike East
1388 Bunker Hill Drive
1839 Prospect Ridge Boulevard
Tavistock Country Club
50 min
16.8 miles
Outage Area
Lawnside School
Healthy Garden & Gourmet Pizza
Collingswood
Woodlynne
Oaklyn
Audubon
Haddon Heights
Tavistock
Barrington
Bellmawr
Runnemede
Magnolia
Glendale
Voorhees Township
GREENTREE
Hertz
Garden State
NJ Tpke
W Rte 70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Total Orders: 7
Time: 8.02 hrs
Work Orders
My Truck
Recommended
Others
Work Order: 509977047
Change Meter.
Meter Loc.:
Alerts:
N/A
Call Ahead:
Yes
Scheduled: Due within 2 days
Accept
Decline
Work Order: 509977047
Inspect water meter.
Meter Loc.:
Alerts:
+1 More
Call Ahead:
Yes
Scheduled: Due within 2 days
Accept
Decline
Work Order: 509977047
Change Meter.
Meter Loc.:
Alerts:
+1 More
Call Ahead:
No
Scheduled: Due within 3 days
Accept
Decline
Work Order: 509977047
Inspect water meter.
Meter Loc.:
Alerts:
Call Ahead:
Yes
Scheduled: Due within 4 days
Total: 4
Time (est.): 1.25 hrs
Difficulty: Medium
8am
9am
10am
11am
12pm
1pm
2pm
3pm
509...
Leakage ...
8:15AM
509977047
Change meter.
9:30AM
07/10/2017
509...
Inspect ...
10:45PM
509977047
Change meter.
11:30AM
50997704
Change meter.
3:15PM
07/10/2017
Layers (3)
301 Martin Avenue
100 Frontage Road
Marlton Pike East
1388 Bunker Hill Drive
Tavistock Country Club
Tavistock
50 min
Hertz
Garden State
GREENTREE
Lawnside School
Outage Area
Healthy Garden & Gourmet Pizza
Glendale
Voorhees Township
Bellmawr
NJ Tpke
W Rte 70

Work Order:
509977047

Call Ahead: No

WORK ORDER DETAILS

Description: Change meter.
Scheduled Date: 07/07/2017 10:30AM
Appt. Window: 8:00AM – 4:30PM

Support Doc(s):
- User Guide
- Install Guide
- Instructional Video
- Safety Instructions
- Reference Sheet
- Material Checklist
- Build Your Own
- Work Order Checklist

Comments: N/A

Emergency 1-2 hrs / 37 min

Alerts: Broken Pielines | Dog In Premise

Safety Guidances [5 Total]

PPE — Personal Protection ...
One or more of your jobs may involve using a Jack hammer. Wear proper work gloves and boots.
Safety Instructions

Heavy Items
Some items for this task are heavy. Use proper hauling equipment. Do not exert yourself.
Instructional Video

Customer At A Glance

Customer
Melinda Largen
1200294707

Customer for
33 Years

Value
$6,008

Connections
4

Started
01/21/2010

Status
Active

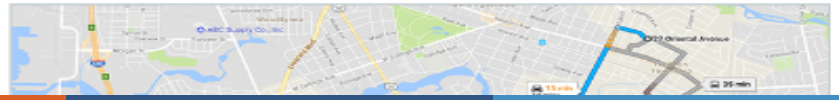
Primary Number
1 (412) 123 4567

Email
melinda.largen@business.com

Services

OPEN C1V

Location [Route Map / Directions]



Meter Info

Meter Location

Date Installed
01/21/2010

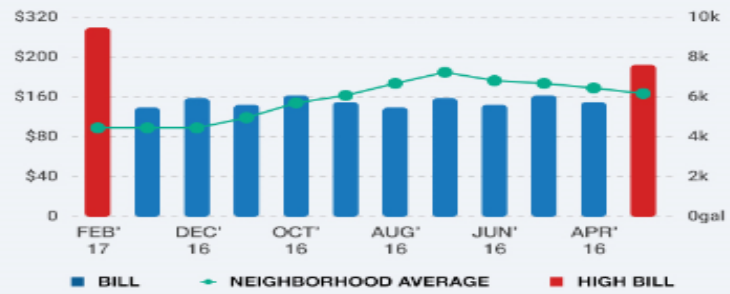
Size
5/8”

Type
Multi-Jet

Manufacturer
Master Meter Inc

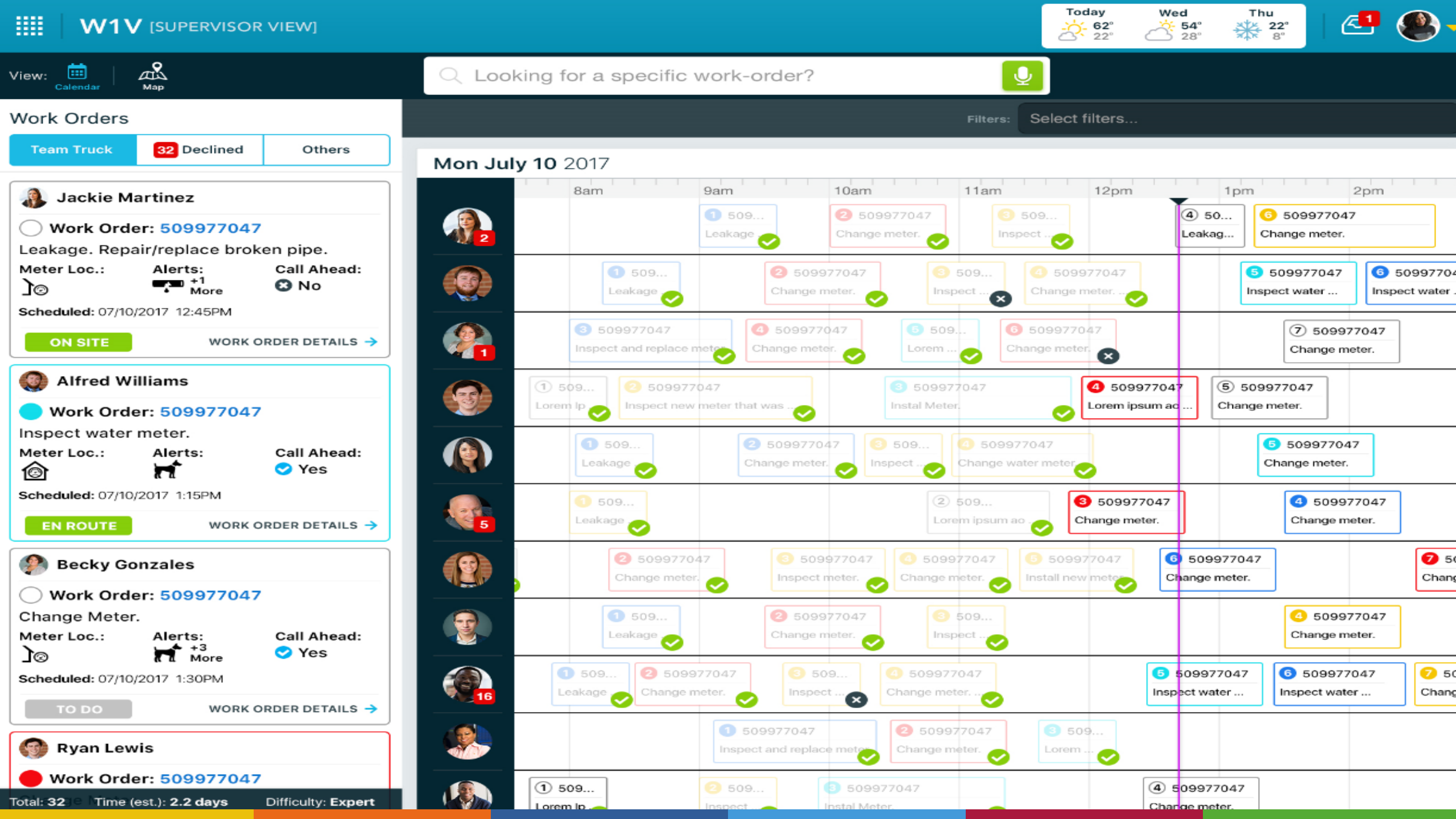
Last Meter Read
JAN 30, 2017
374 (ACTUAL)
6 Units (6,000gal)

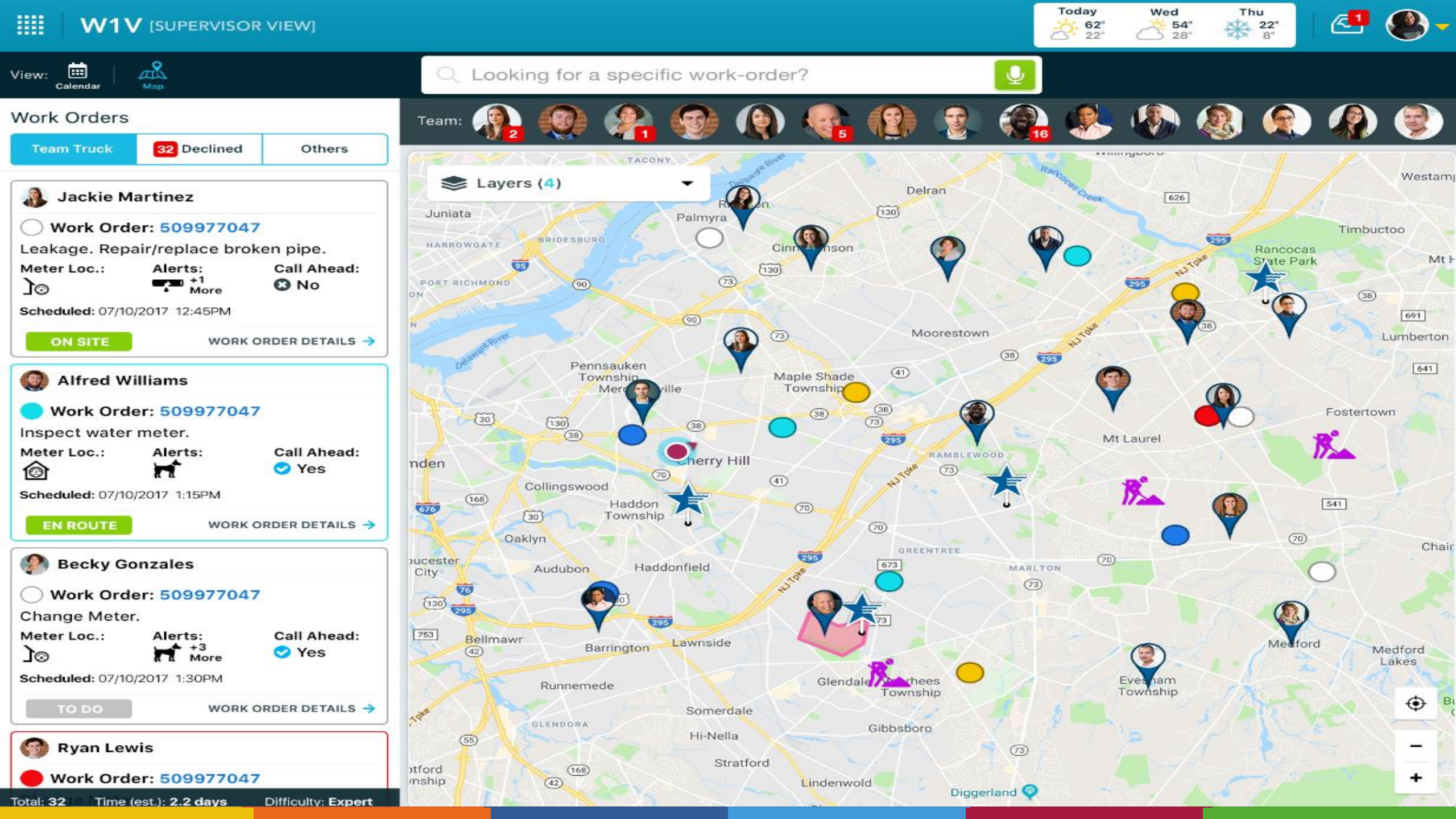
Next Meter Read
FEB 28, 2017 (Est.)
376 (Est.)
6 Units (6,000gal) (Est.)



OPEN METEROPS

AMERICAN WATER


W1V [SUPERVISOR VIEW]
Today 62° 22°
Wed 54° 28°
Thu 22° 8°
View: Calendar Map
Looking for a specific work-order?
Filters: Select filters...
Work Orders
Team Truck
32 Declined
Others
Jackie Martinez
Work Order: 509977047
Leakage. Repair/replace broken pipe.
Meter Loc.:
Alerts: +1 More
Call Ahead: No
Scheduled: 07/10/2017 12:45PM
ON SITE
WORK ORDER DETAILS
Alfred Williams
Work Order: 509977047
Inspect water meter.
Meter Loc.:
Alerts:
Call Ahead: Yes
Scheduled: 07/10/2017 1:15PM
EN ROUTE
WORK ORDER DETAILS
Becky Gonzales
Work Order: 509977047
Change Meter.
Meter Loc.:
Alerts: +3 More
Call Ahead: Yes
Scheduled: 07/10/2017 1:30PM
TO DO
WORK ORDER DETAILS
Ryan Lewis
Work Order: 509977047
Total: 32 Time (est.): 2.2 days Difficulty: Expert
Mon July 10 2017
8am
9am
10am
11am
12pm
1pm
2pm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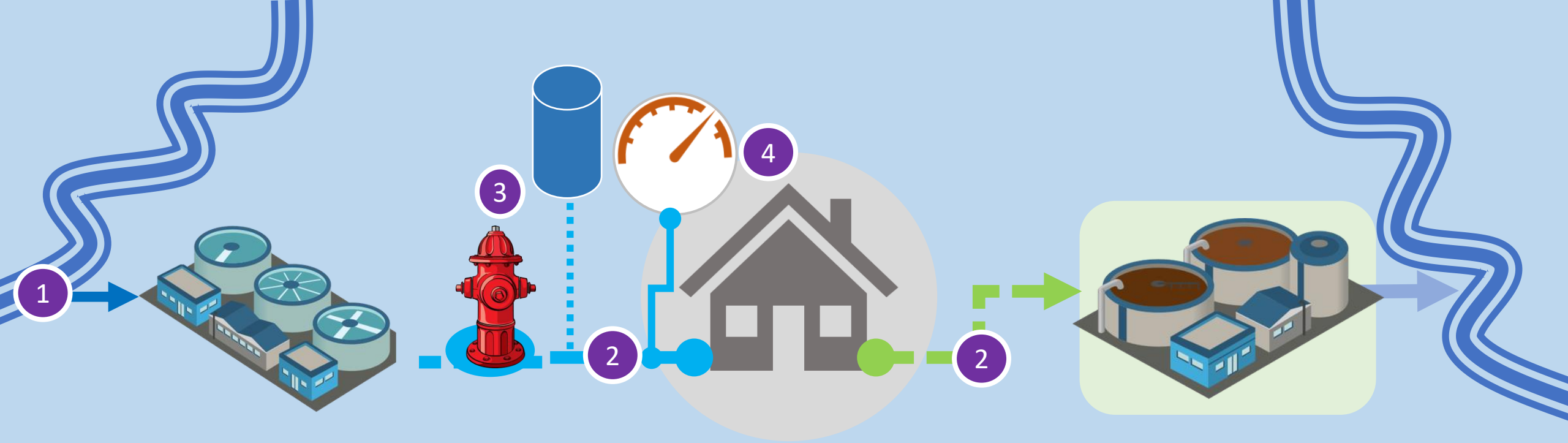
Scheduled: 07/10/2017 1:30PM
TO DO
WORK ORDER DETAILS
Ryan Lewis
Work Order: 509977047
Total: 32 Time (est.): 2.2 days Difficulty: Expert
Layers (4)
Juniata
Palmyra
Delran
Timbuctoo
Rancocas State Park
Moorestown
Lumberton
Pennsauken Township
Maple Shade Township
Mt Laurel
Fostertown
Cherry Hill
Collingswood
Haddon Township
Oaklyn
Audubon
Haddonfield
Barrington
Lawnside
Bellmawr
Runnemede
Somerdale
Hi-Nella
Stratford
Lindenwold
Gibbsboro
Glendale
Evesham Township
Medford
Medford Lakes
Diggerland
TACONY
HARROWGATE
BRIDESBURG
PORT RICHMOND
RAMBLEWOOD
GREENTREE
MARLTON
GLENDORA
NJ Tpke

AMERICAN WATER



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Imagine Your Water Distribution Assets… Smarter

- My service pressure is 35 psi.
- There's a leak inside this home.
- My valve is closed.

- My pressure has dropped 15 psi in the last hour.
- There's a 100 gpm leak close to me.

- I am partially open.
- Chlorine levels are OK.
- I'm seeking a leak.
- I've seen 1,200 gallons of flow in the last hour.

- Chlorine residuals are too low.
- I'm going to flush until chlorine levels are OK.

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Strong Need for Intelligence in Water Distribution Systems

Black & Veatch 2018 Strategic Directions in the U.S. Water Industry

"The true value of digital water emerges when we move from data harvesting to data science. Collecting information is good. Using data to make better decisions and plan for a safe and abundant supply is game-changing."

Water Conservation

- 30% of U.S. experiencing drought or abnormally dry conditions(1)
- 240,000 water main breaks per year(2)
- 27% increase in break rates since 2012(3)

Non-Revenue Water

- Up to 30% of treated water is lost or unaccounted for in the water system(4)
- Growing number of states requiring water loss audits(5)

Customer Service Focus

- Awareness / Education
- Ongoing monitoring
- Sustainability

(1) U.S. Drought Monitor as of January 29, 2019 (includes contiguous 48 states)
(2) EPA Aging Water Infrastructure Research Program
(3) "Water Main Break Rates in the USA and Canada: A Comprehensive Study," March 2018, Steven Folkman at Utah State University
(4) Navigant Research
(5) National Resource Defense Council

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Water Loss & Non-Revenue Water

<table>
<tr><th colspan="5">AWWA Standard Water Balance</th></tr>
<tr><td rowspan="6">System Input Volume</td><td rowspan="4">Authorized Consumption</td><td rowspan="2">Billed Consumption</td><td>Billed, Metered Consumption</td><td rowspan="2">Revenue Water</td></tr>
<tr><td>Billed, Un-Metered Consumption</td></tr>
<tr><td rowspan="2">Unbilled Consumption</td><td>Unbilled Metered Consumption</td><td rowspan="4">Non-Revenue Water</td></tr>
<tr><td>Unbilled, Un-Metered Consumption</td></tr>
<tr><td rowspan="3">Water Loss</td><td rowspan="2">Apparent Losses</td><td>Unauthorized Consumption</td></tr>
<tr><td>Meter Inaccuracy</td></tr>
<tr><td>Real Losses</td><td>Leakage</td></tr>
</table>

Our Solutions to Reduce Water Loss

Hydro-Guard®

FLOW-BASED PRESSURE MANAGEMENT

Singer®

Hymax®

SPEED & QUALITY OF REPAIRS

REDUCED WATER LOSS

ACTIVE LEAK CONTROL

EchoShore®

Mueller®

PIPE AND ASSET MANAGEMENT

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EchoShore-DX Pilot Deployment by NJ American Water (NJAW)

- 950 Hydrant-based nodes commissioned in 2016 across 6 water systems
- In 2018, NJAW won the NJ Governor's Award for most innovative technology
- Business Impacts Highlighted
  - **Water Savings:** 1.1 billion gallons of water in the first 2 years of deployment, enough to overflow AT&T Stadium, or serve a community of 30,500 people per day
  - **Financial Return:** Initial pilot paid back in 9 months.
  - **Environmental:**
    - Reduced energy by 3.3 million kWh, or over $400K in energy costs
    - Saved 900,000 kg of GHG, equivalent to removing 170 cars of the road
  - **Social:** Reduced neighborhood disruptions, e.g., repairs scheduled

Why Use Fire Hydrants to Monitor the Distribution System?

.Wet and Dry Barrel Smart Hydrants

- The package is already there
  - We estimate 7 to 10M hydrants installed in the US
- The package belongs to the water utility
  - No additional footprint or infrastructure is required
- In to leaks, we help utilities monitor pressure

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Creating Value by Combining Platforms

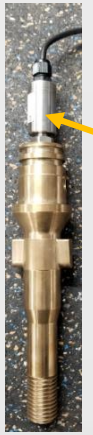
Hydrant Cutaway

Cellular Hub

Echoshore DX (leak detection)

Pressure and other sensors integrated into the main valve and lower stem for water system monitoring without charging the hydrant.

Smart Stem



Bluetooth Antenna

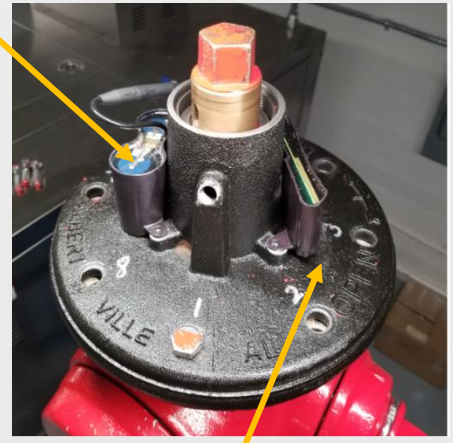
Batteries

Electronics (PCB)

Pressure sensor

Cellular Hub Bonnet

Batteries



Electronics (PCB) & Cellular antenna

Sentryx™ Water Intelligence Platform

	SENTRYX™ WATER INTELLIGENCE	LEADING COMPETITORS
Usage	√	√
Leaks	√	√
Pressure	√	
Chlorine Levels	√	
ph Levels	√	
Temperature	√	

Sentryx™ Water Intelligence outperforms all others. It's the one platform for all the data intelligence you need including water quality, leak detection, pressure, increased security and much more.

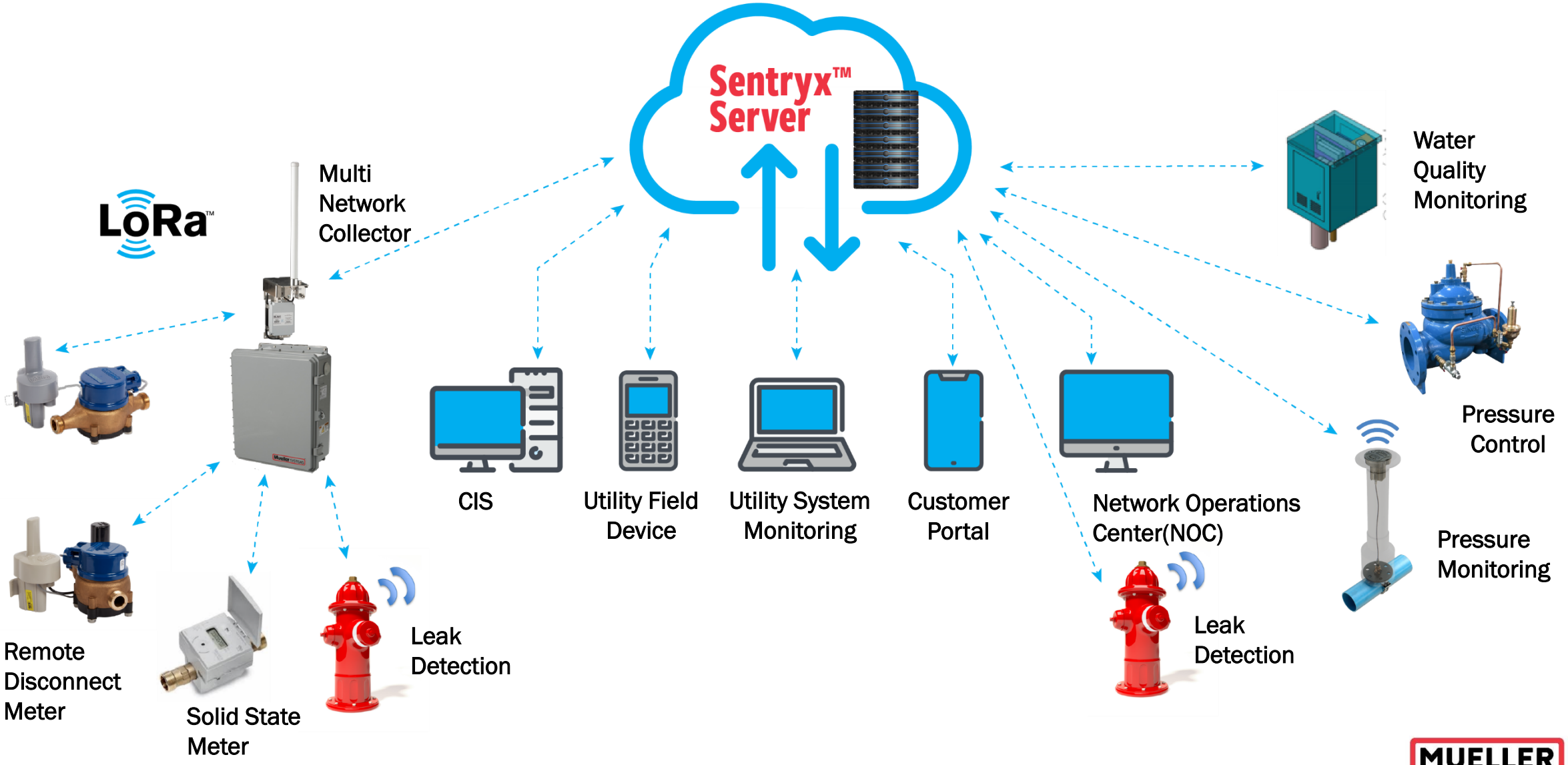
Leak Detection

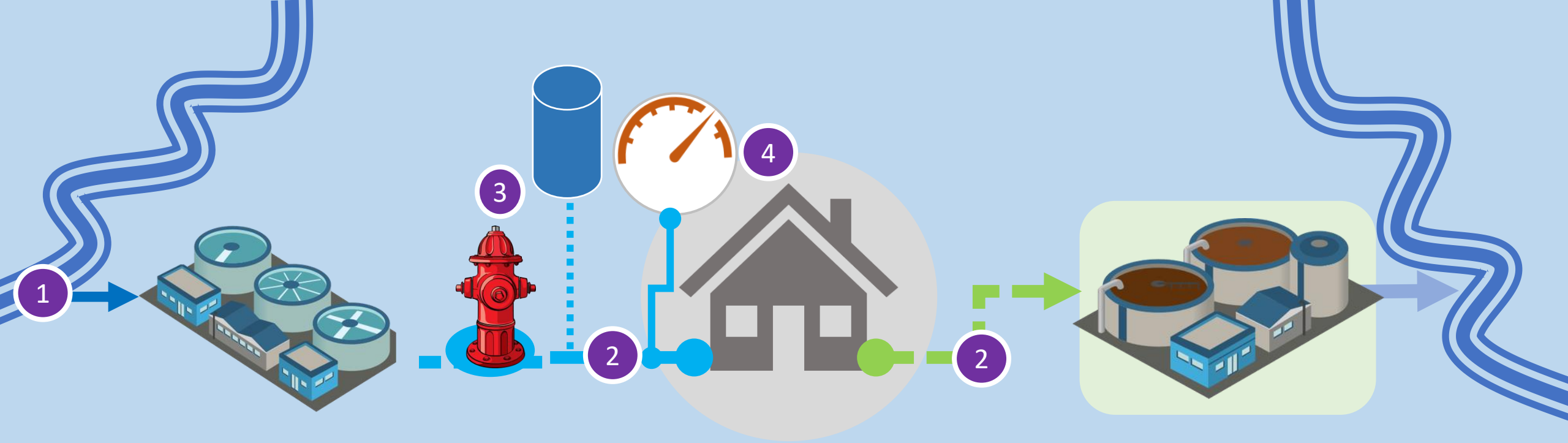
Pressure Monitoring

Water Quality

Water Meters

Mueller® Smart Water Infrastructure Network





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Asset Management & Capital Investment

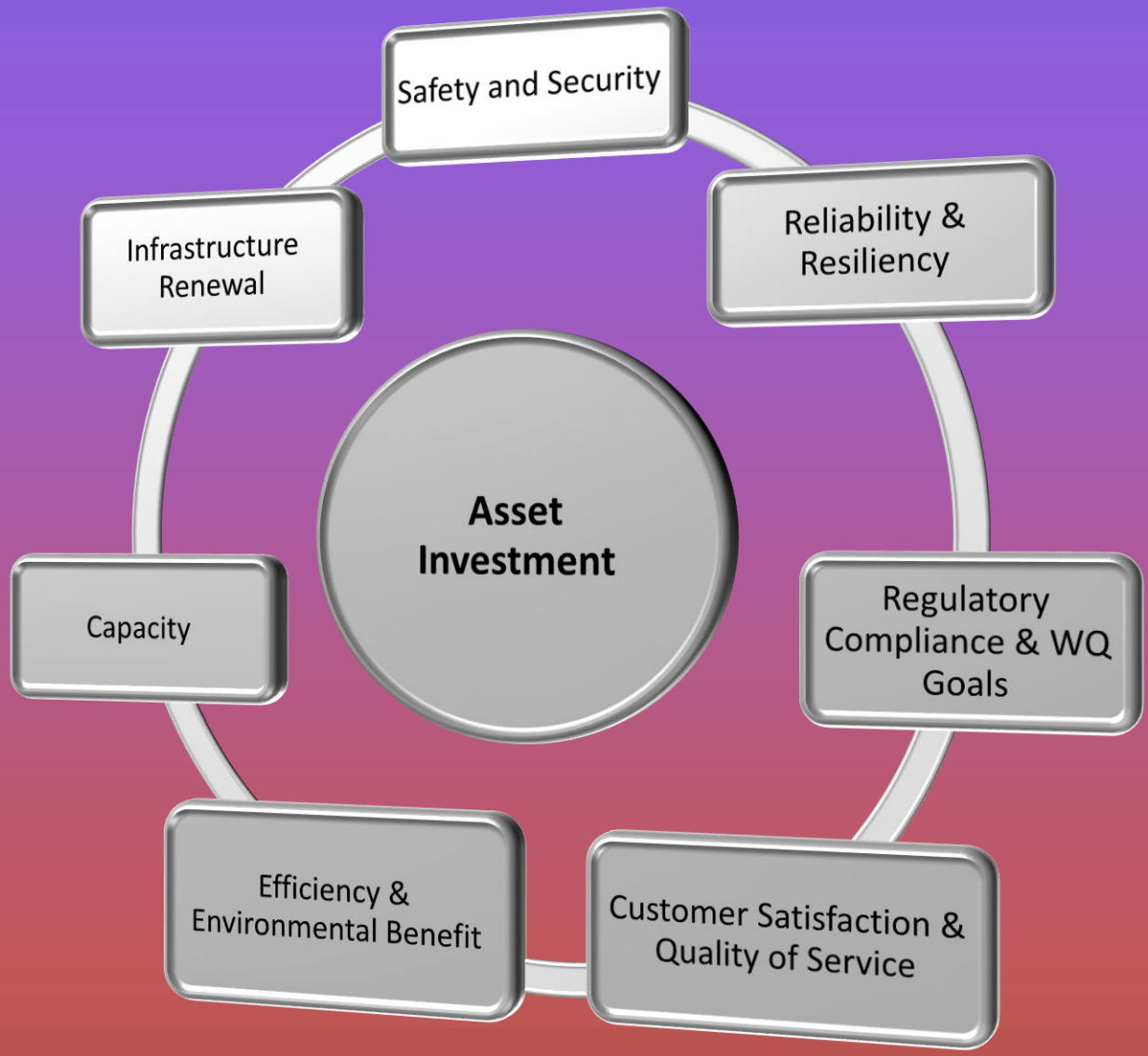
Operating Data
External Data

↓

Risk Assessments
System Master Plans

↓

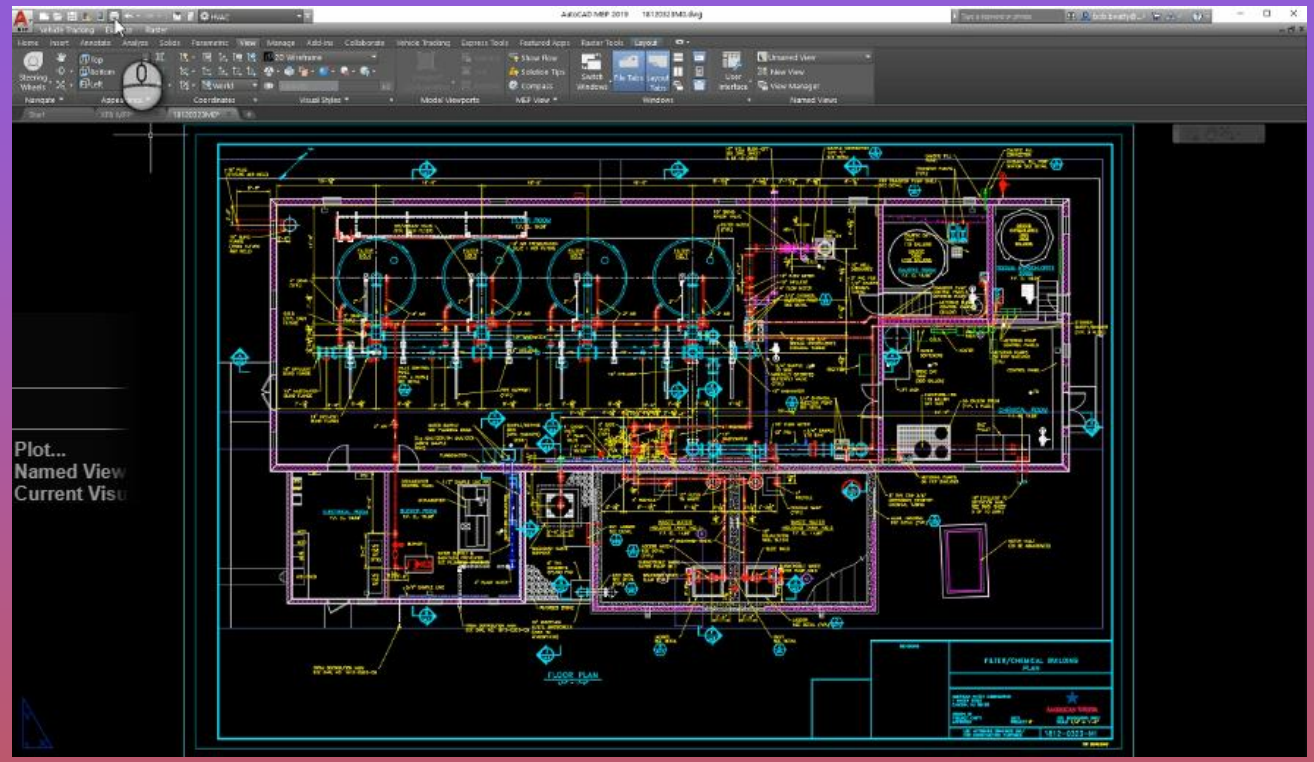
Capital Investment Plans
Emergency Response Plans
Tabletop Exercises



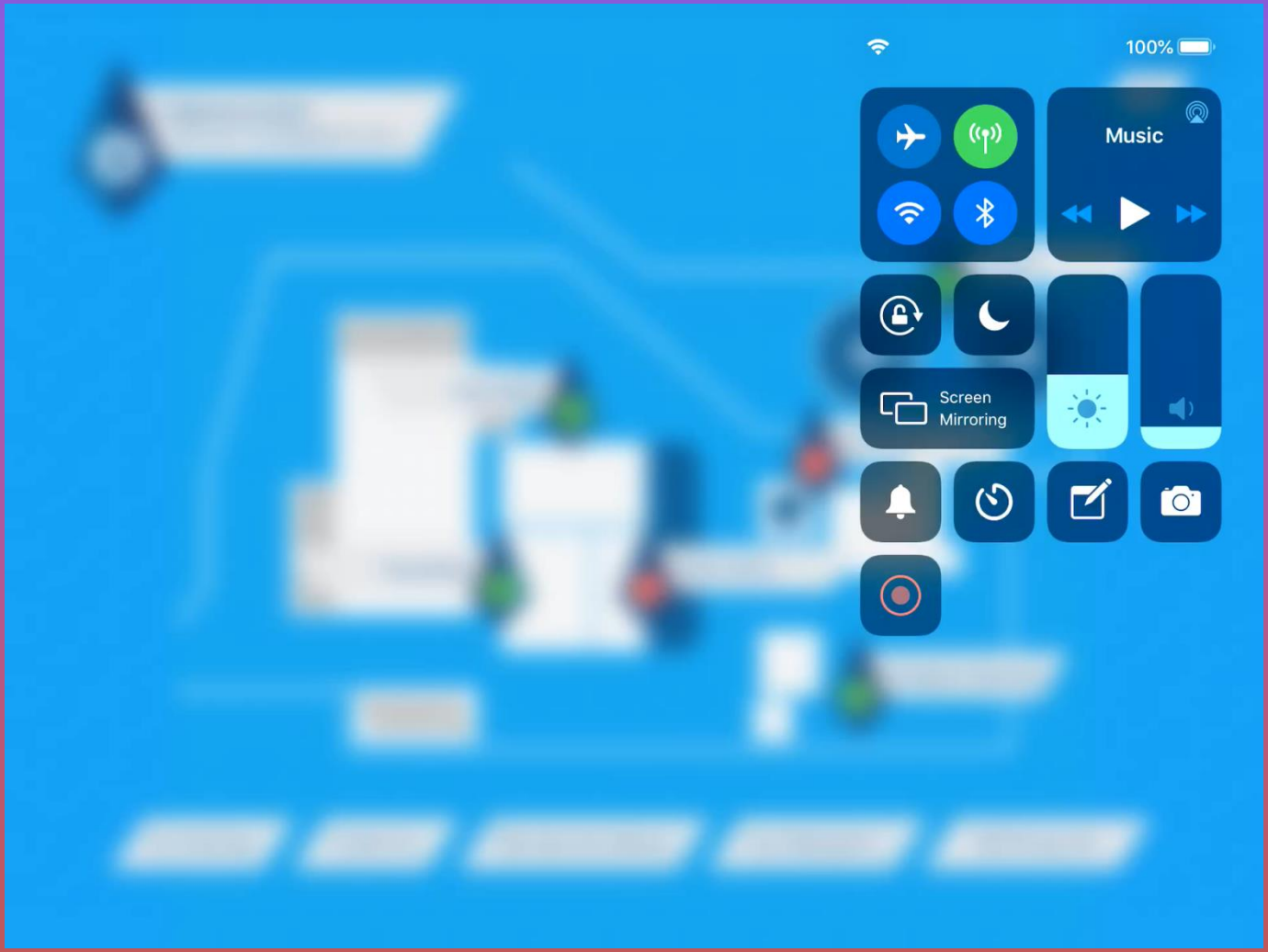
Capital Investment – Facility Design

3D Visualization Models

- Improves safety, O&M
- Reduces construction conflicts
- Public Meetings

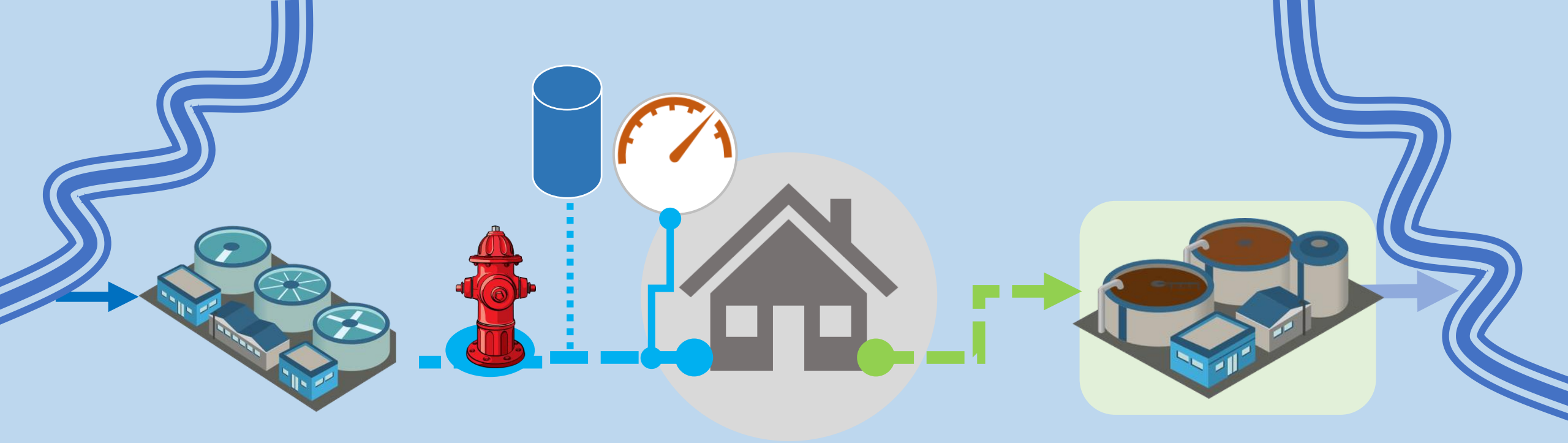


Asset Management – Facility Operation



- Proof Of Concept - 2020
- Chemical Safety Sheets
- Training Videos, Manufacturer Information & Manuals
- Improve Response Time


Water Quality
Service
Reliability
Value
Making Life Easy for Water Utility Customers



Audience Questions & Discussion