

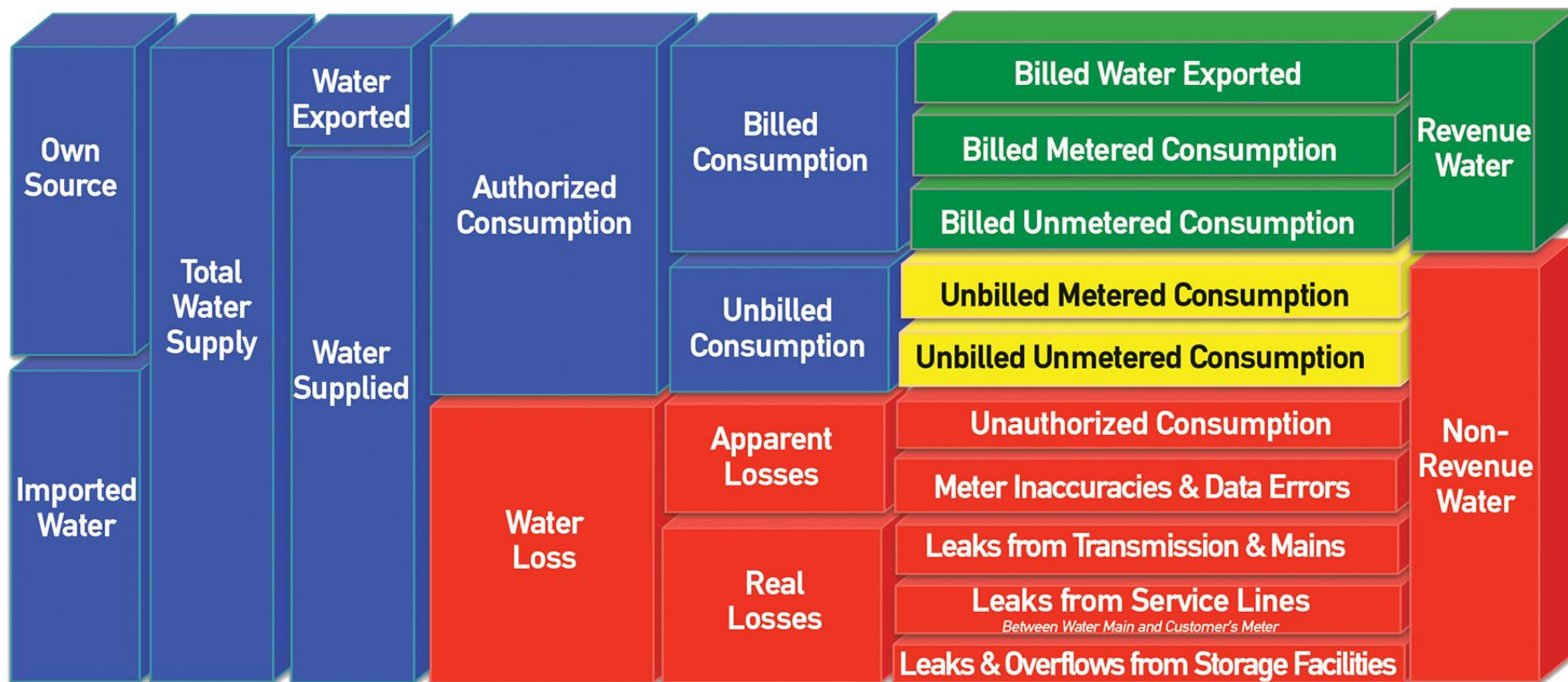


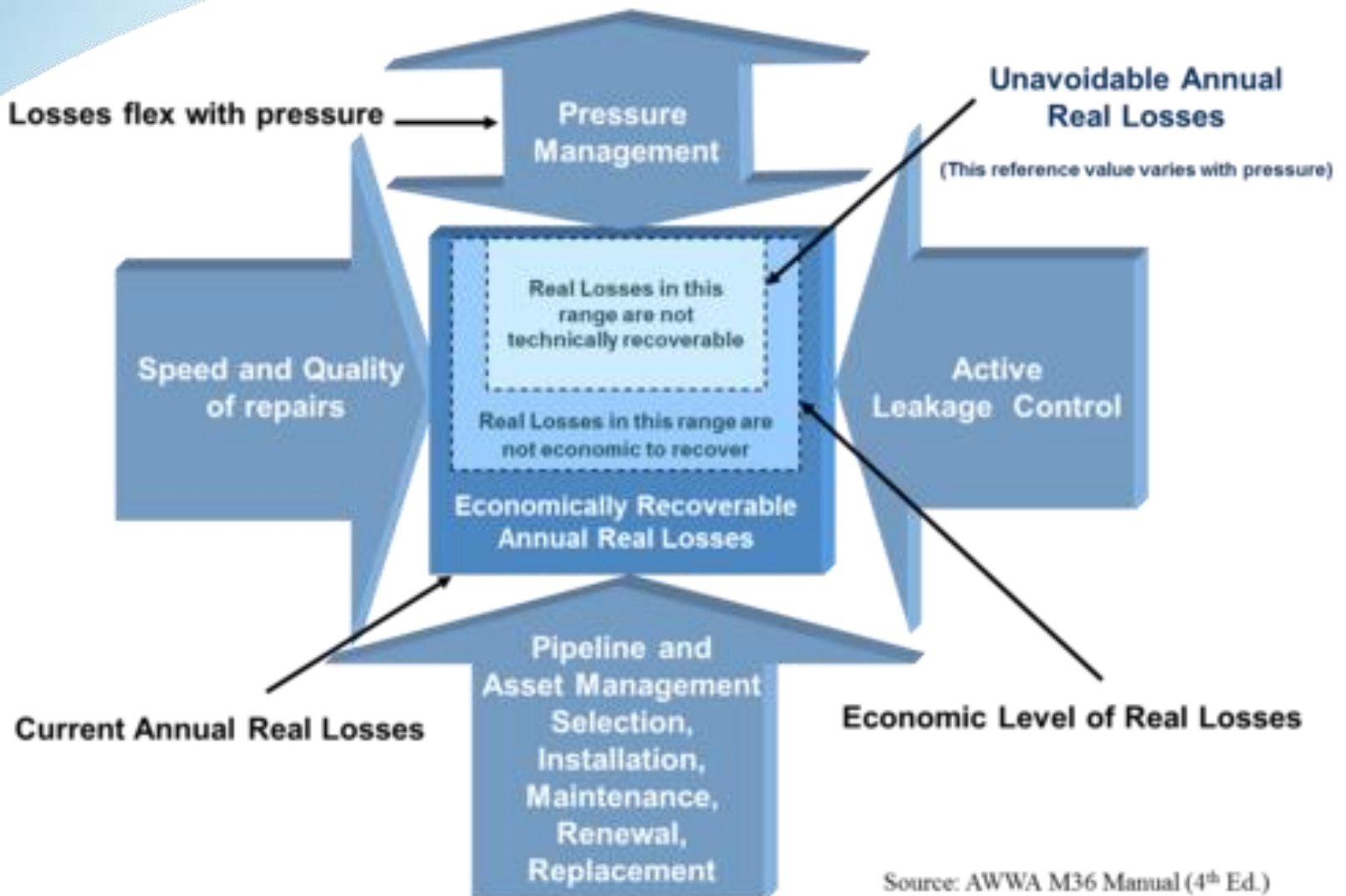
***iHydrant™***

## My Background

- Dot.com Technology
- 10 years as AMI Project Manager/Account Manager
- Developing technologies in Water – what's next?
  - Operational technologies
    - Remote leak and pressure technology
    - Remote Water Quality

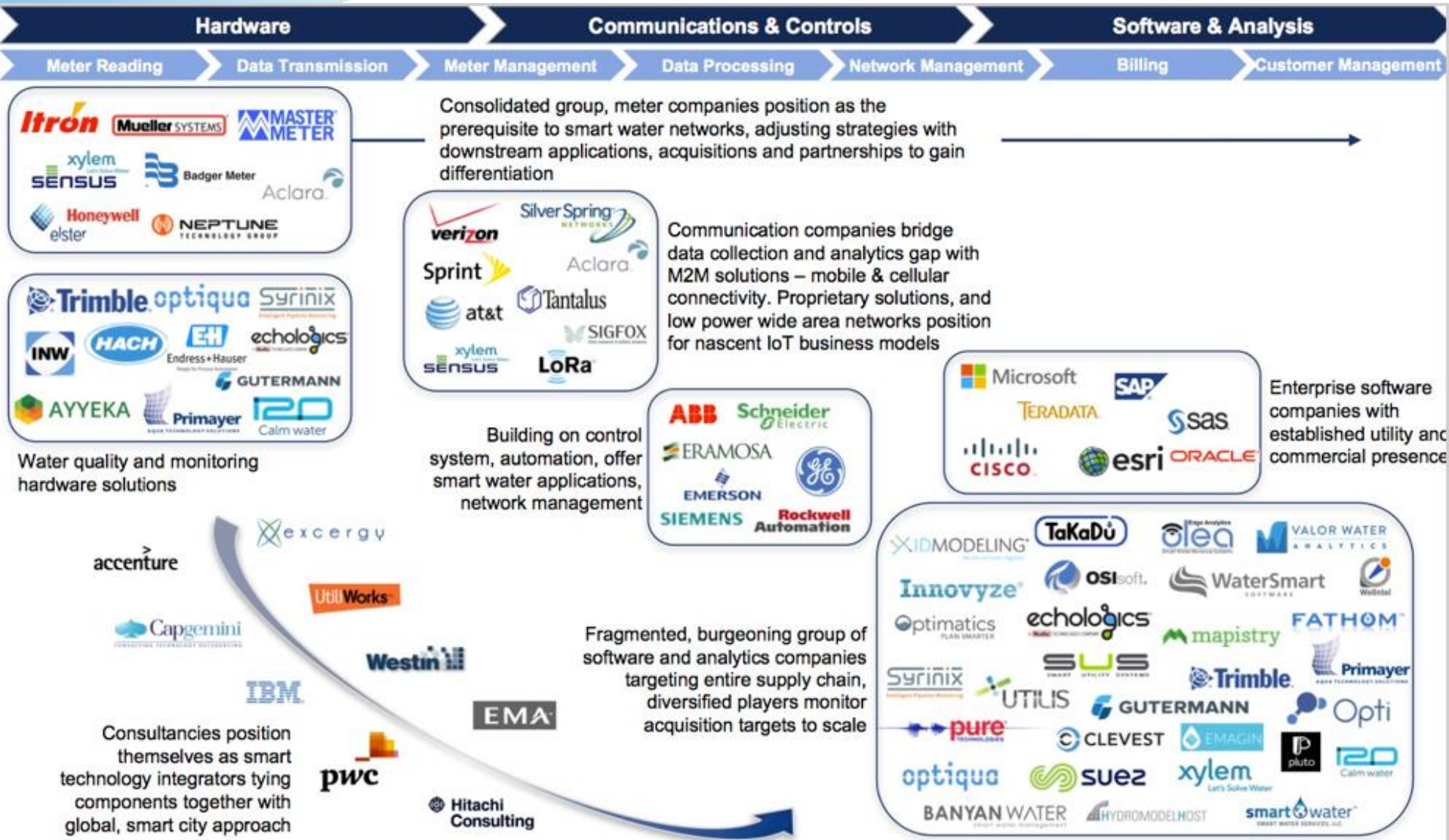
## Water Balance Table



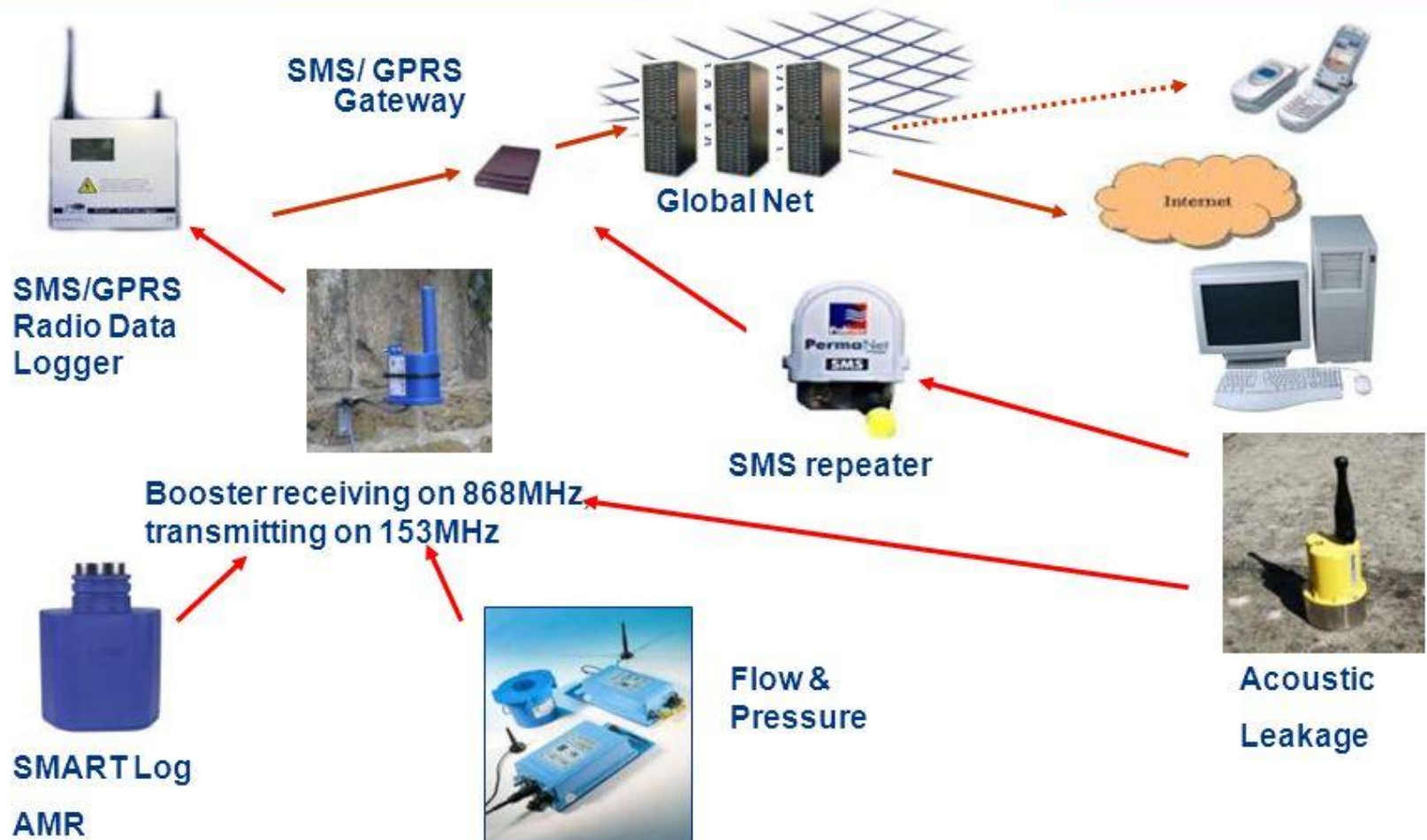


Source: AWWA M36 Manual (4<sup>th</sup> Ed.)  
Original Credit: Dave Pearson





## Permanent Leak Detection via PermaNet Options.....



## Water Technology Challenges

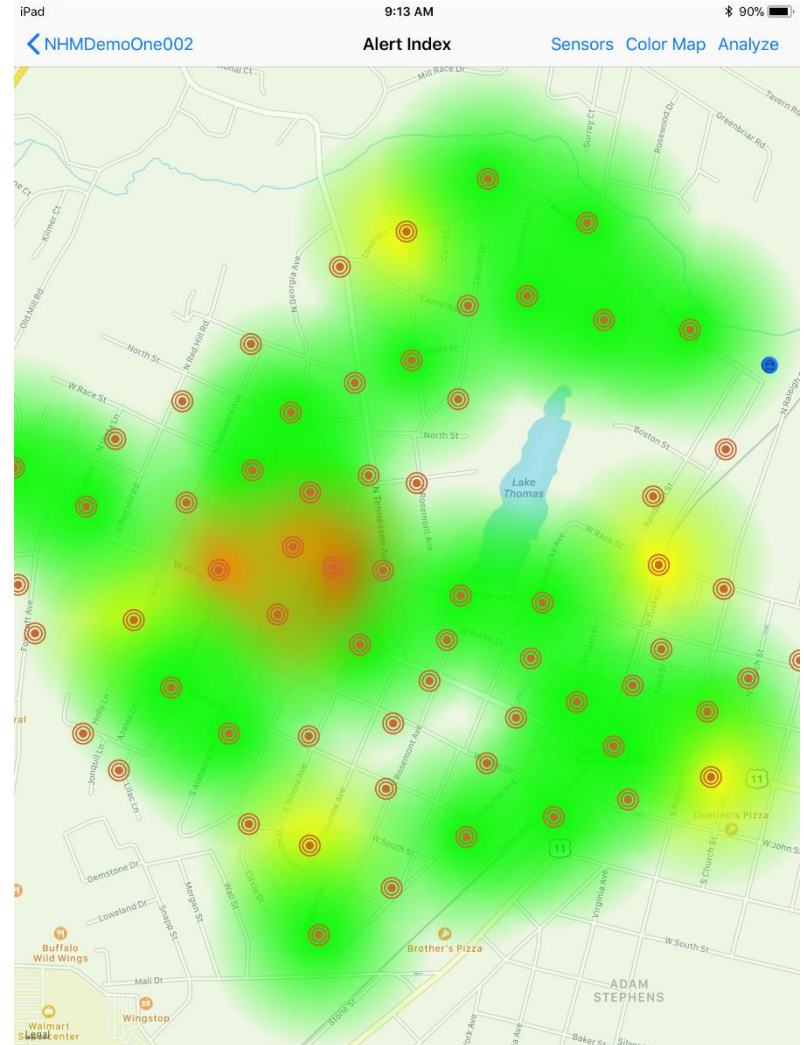
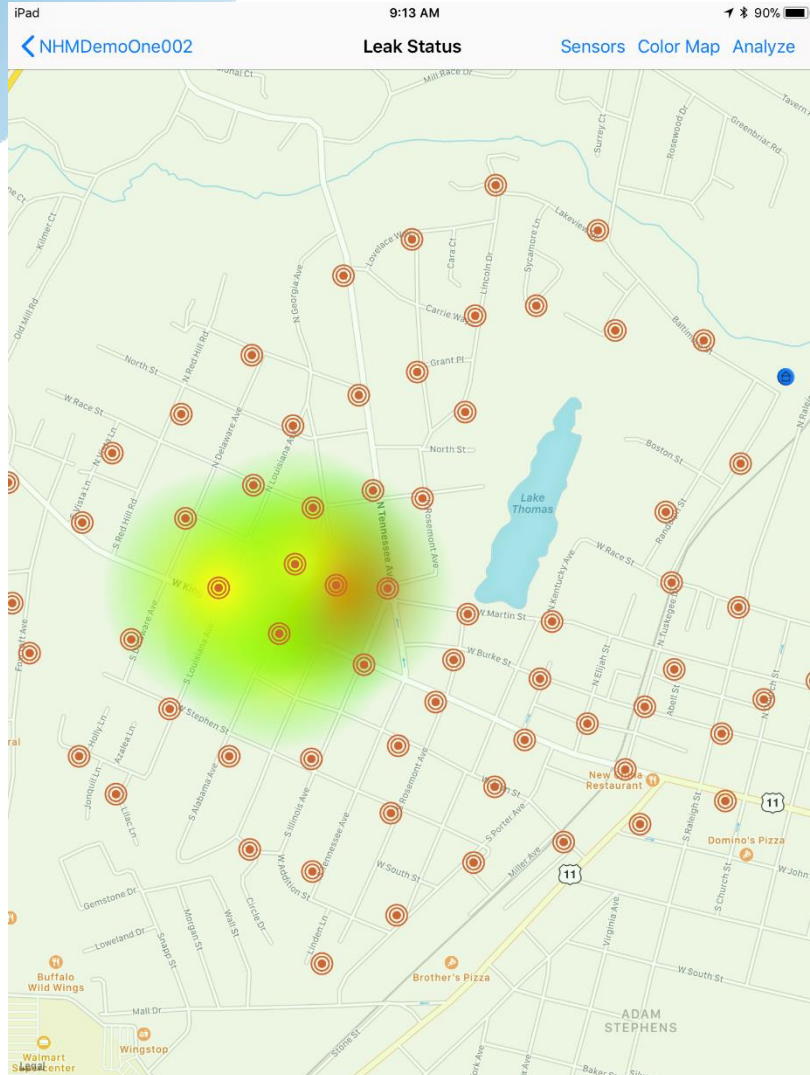
- Battery
- Access points – Where to put it
  - Reception
- Customization to Utilities
- Backhaul – 3G/4G, etc.
- People

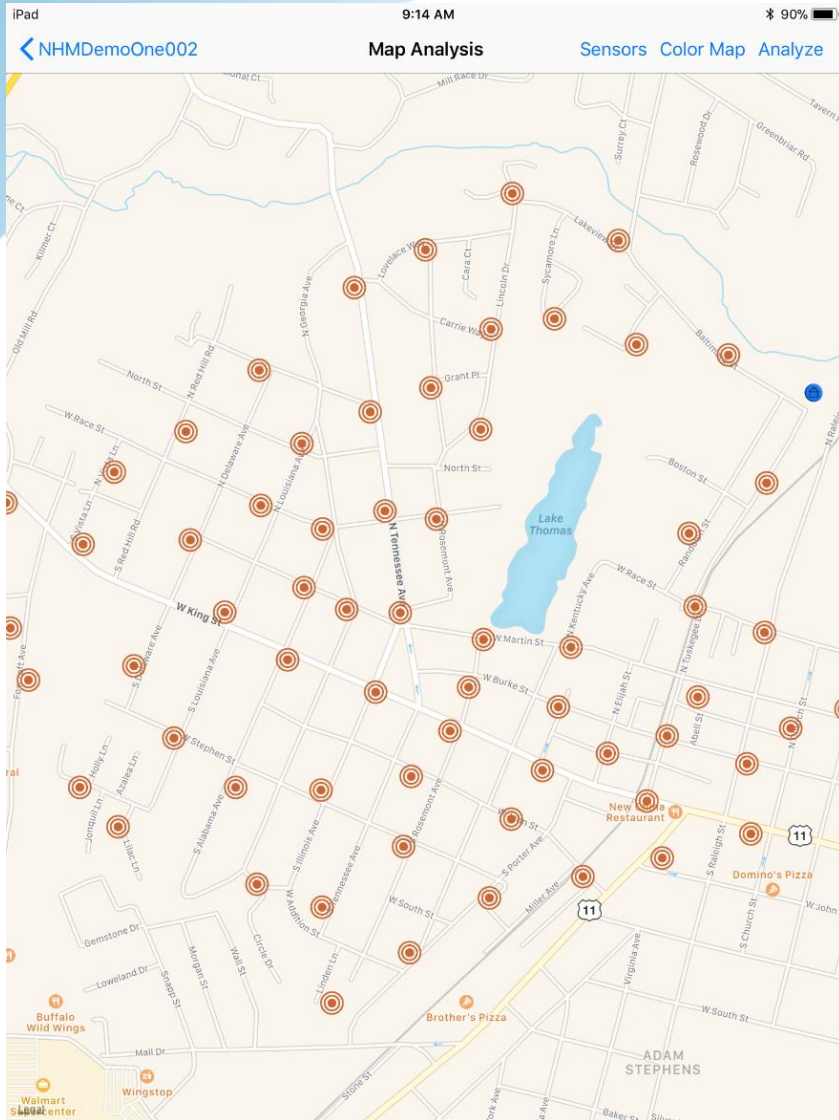
## Leak Detection Struggle

- False positives waste utility time and resources
- False Negatives
- Infrastructure is either limiting to your AMI provider OR costly to maintain
- Battery life
- ROI for a full time monitor



# Leak Detection Solution





iPad 9:14 AM 90%

< Map Analysis Sensors

Search by name or address

By Leak Status	By Alert Index	By Asset Name
H31	101 S Georgia Ave Martinsburg WV 25401	76
H32	1251-1313 W Martin St Martinsburg WV 25401	68
H34	1400 W King St Martinsburg WV 25401	67
H28	1225 W King St Martinsburg WV 25401	66
H19	508 Edgemont Ter Martinsburg WV 25401	49
H62	409 W King St Martinsburg WV 25401	48
H36	301 S Delaware Ave Martinsburg WV 25401	47
H2	565-599 W Race St Martinsburg WV 25401	47
H50	425 S Tennessee Ave Martinsburg WV 25401	46
H23	725 Baltimore St Martinsburg WV 25401	41
H29	300 N Louisiana Ave Martinsburg WV 25401	40
H20	604 Lincoln Dr Martinsburg WV 25401	40
H27	1297-1303 W Race St Martinsburg WV 25401	40
H21	418 Sycamore Ln Martinsburg WV 25401	39
H41	1602 W King St Martinsburg WV 25401	39
H3	669-727 W Martin St Martinsburg WV 25401	37
H56	422 S Porter Ave Martinsburg WV 25401	37
H60	601 W John St Martinsburg WV 25401	37
H59	100 S Raleigh St Martinsburg WV 25401	36



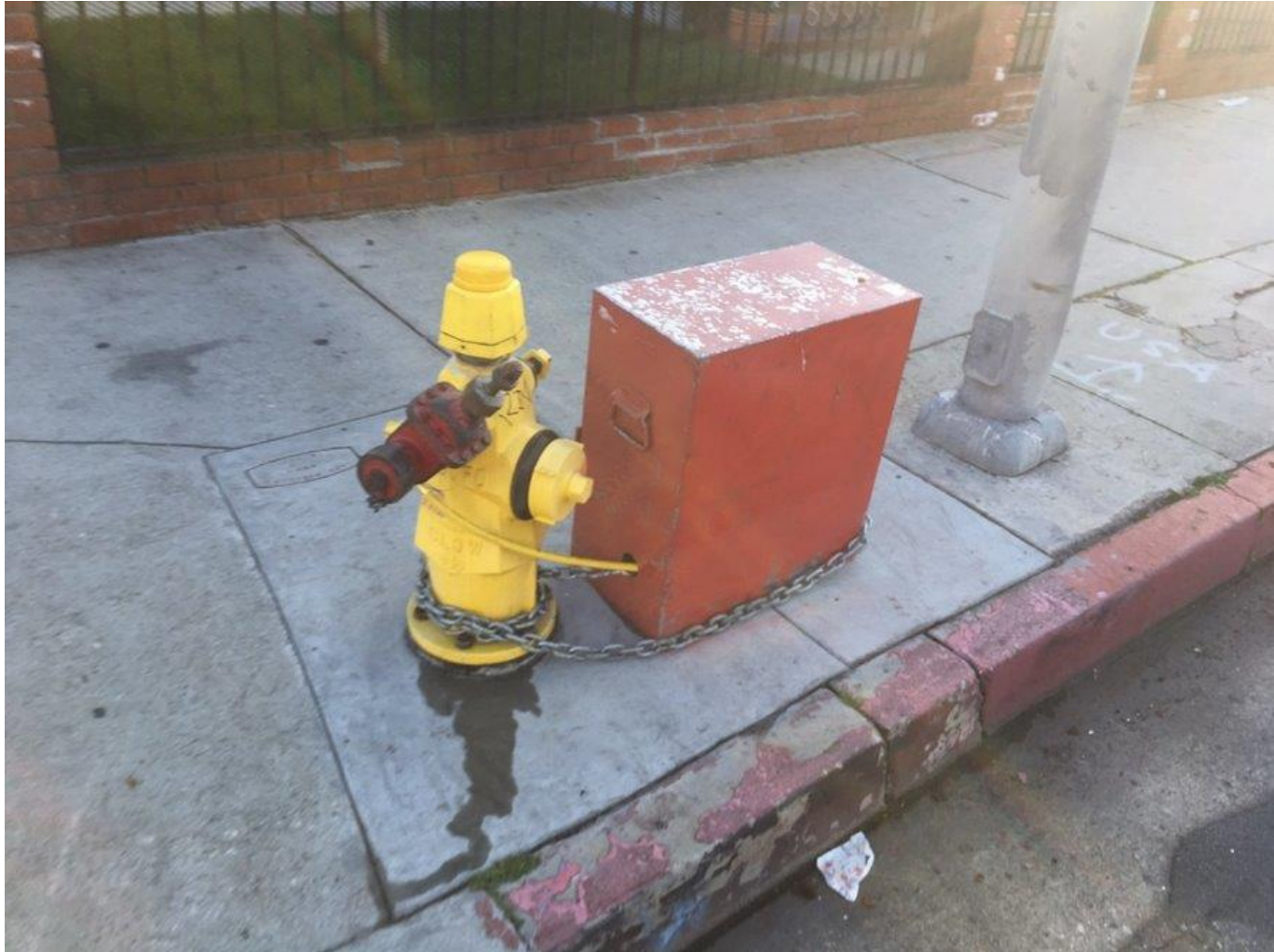
## How to Deploy Leak Detection

- Local Loggers/hydrophone
  - Pinpoints leaks after area is suspected or detected
- “Lift N Shift”
  - Moves fixed units through a territory throughout the year
  - Labor to move throughout system
- Fixed
  - Traditionally cost prohibitive
  - Every 2-3 hydrants/valves

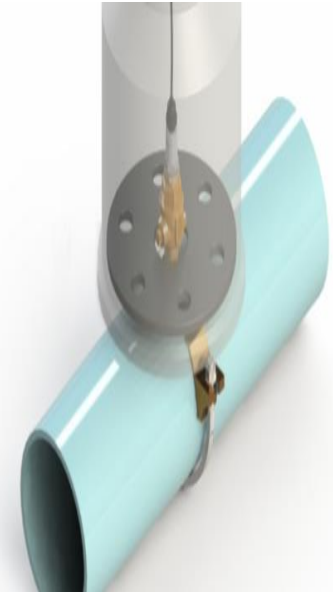
## Challenges with Pressure Monitoring

- Typically a Manual Process outside of pump stations
- Often a Temporary/Seasonal Solution
- May Require Digging or Tapping a Pipe
- Limits normal operation of Fire Hydrant

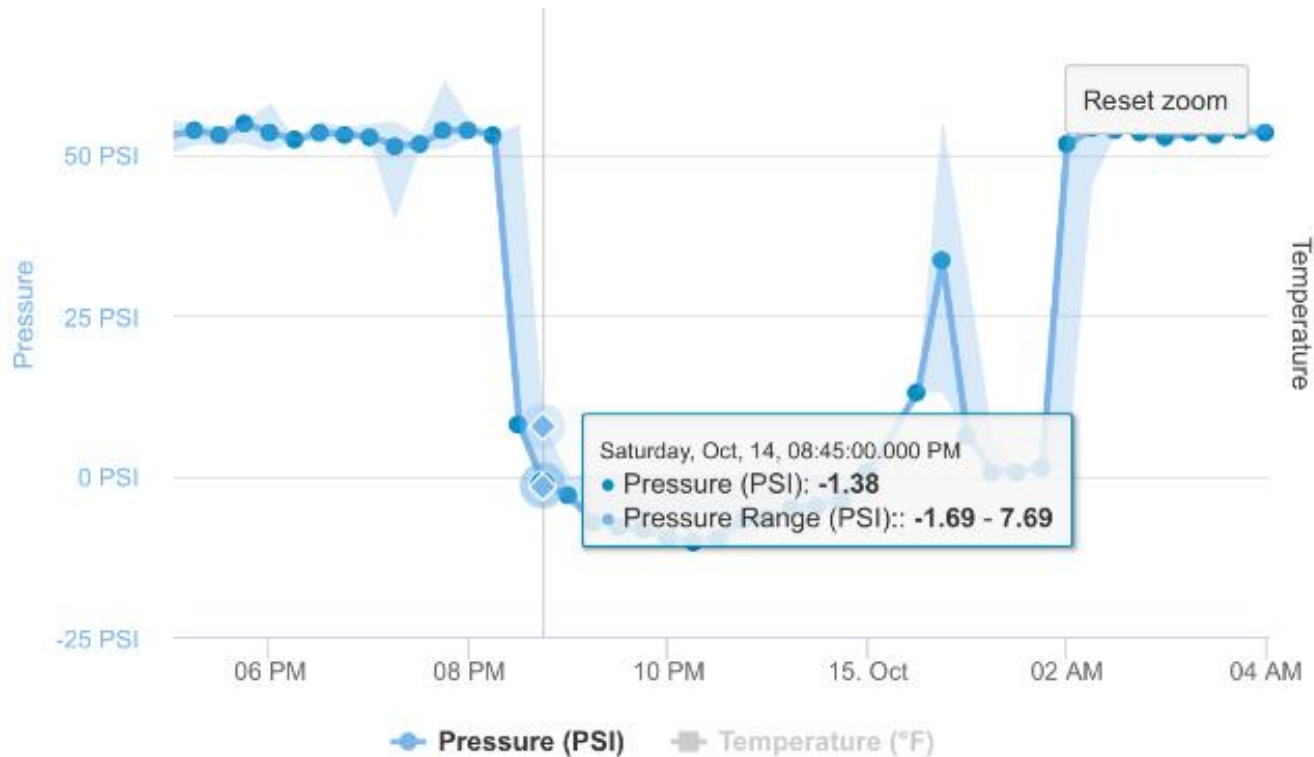




## Pressure Locations



## Benefits of Pressure Monitoring



## Benefits of Pressure Monitoring

- More Accurate Hydraulic Models
  - Spend Wiser
- Reduce Pipe Stress
  - Valve Operation
  - Pump Operation
- Notifications of System Changes
  - Contractor Breakage
  - Theft

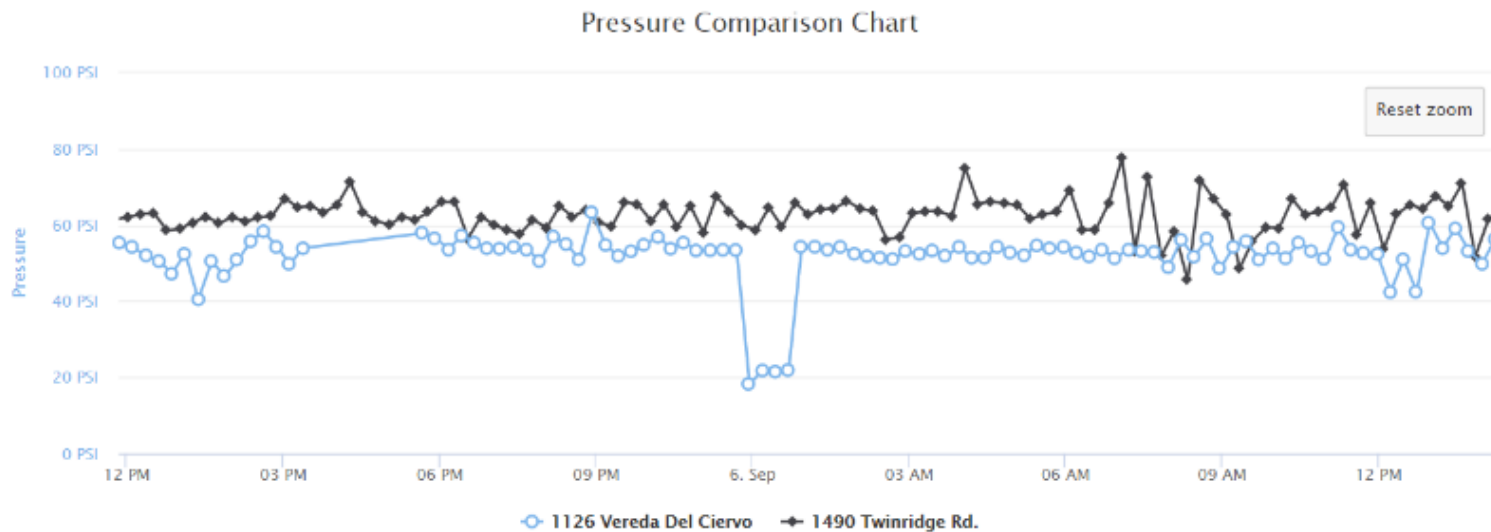


## Benefits of Pressure Monitoring

### Compare Hydrant Pressures

Criteria

Result



## Pressure Deployment Strategies

- 1 of every 20-30 hydrants
  - Elevations and number of pressure zones will impact
- Areas of known pipe issues
- Spend as part of Capital Budget when ordering hydrants
- Spend as a small fraction to new tanks/expansion projects



## Questions?

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