

# Real-Time GIS Data for Optimized Operations

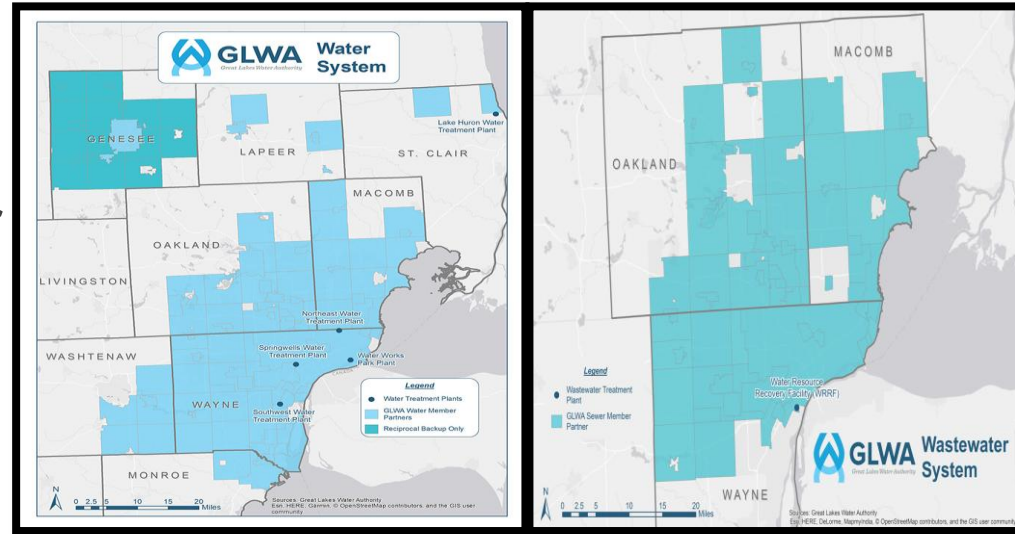
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Betty Thomas



# GLWA: Great Lakes Water Authority



- Water and Sewer services in Southeast MI
- 3 million people for Sewer Services
- 4 million people for Water Services
- 803 miles transmission mains
- 185 miles of sewer pipes



# Overview

## ➤ 45+ facilities

- 5 Water Treatment Plant – 1.72 BGD
- 19 Water Booster Stations
- 9 Sewer Lift Stations
- 9 CSO Basins



# Overview :continue

## ➤ 500+ Remote Sites

- WAMR
- Rain Gauges
- Sewer Meters
- Pressure Sites
- Valve Remote sites
- Level sensors
- CSO Outfalls





# Overview: Continue

## ➤ Water Resource Recovery Facility

- One of the Oldest and Largest Waste Water Treatment Plant in the United States.
- Capacity of Treating Storm and Sewer Flow up to 1800 MGD primary and 930 MGD secondary.



# GLWA Consists of three different departments:

1. Water Distribution
2. Wastewater Treatment
3. Freshwater Treatment

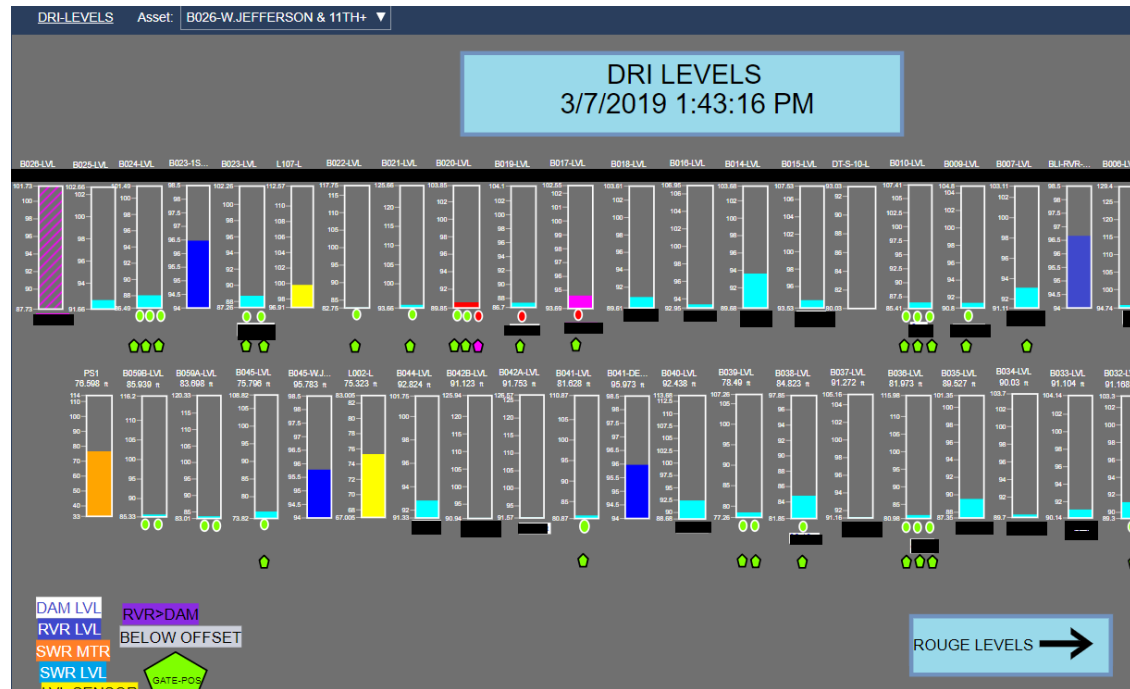
# System Control Center (SCC)

- SCC monitors the Data 24/7 and operate the water distribution and wastewater collection system



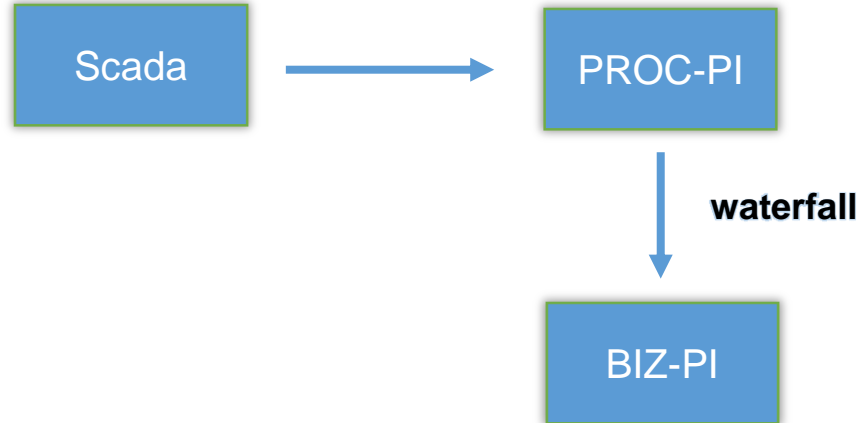
# PI and System Control Center

- Data is also sent to PI for Monitoring and Analyzing:
- PI Datalink
- PI Vision
- PI AF

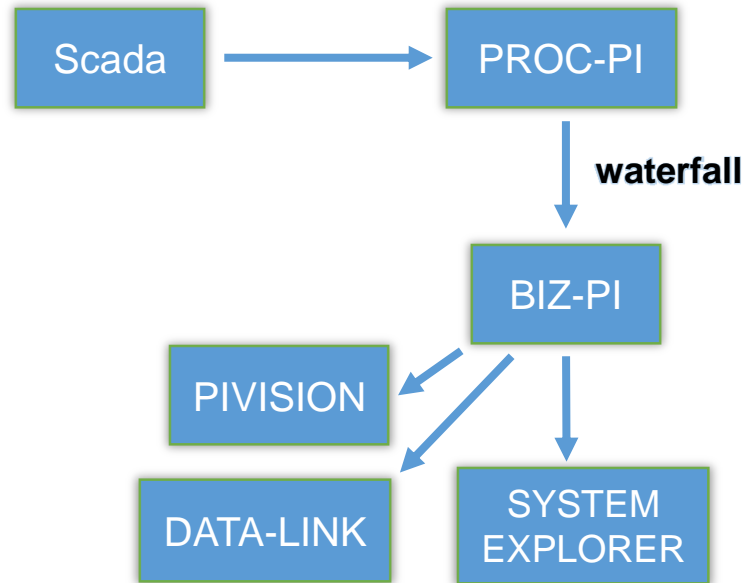




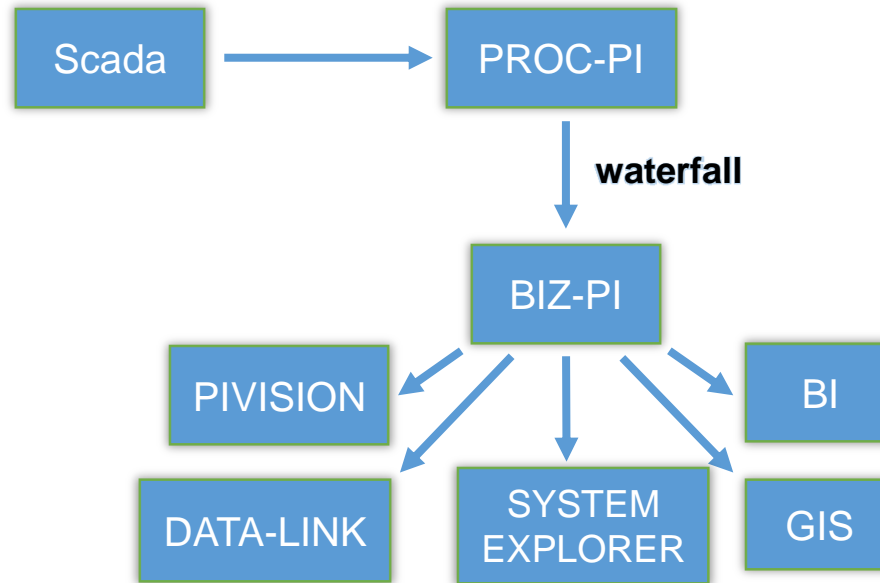
# PI Architecture: 2012



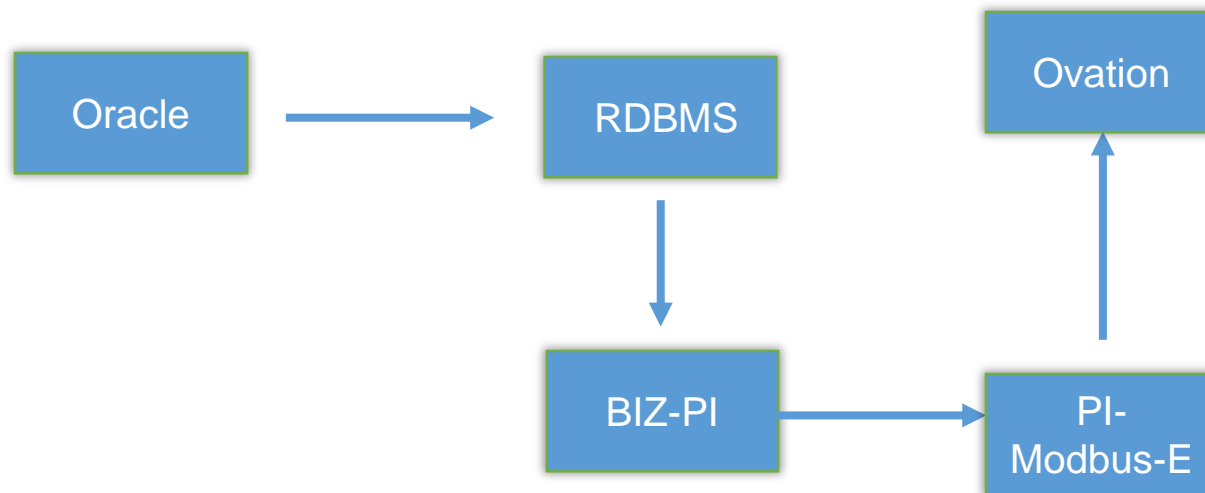
# PI Architecture: 2013-2015



# PI Architecture:2016-2018

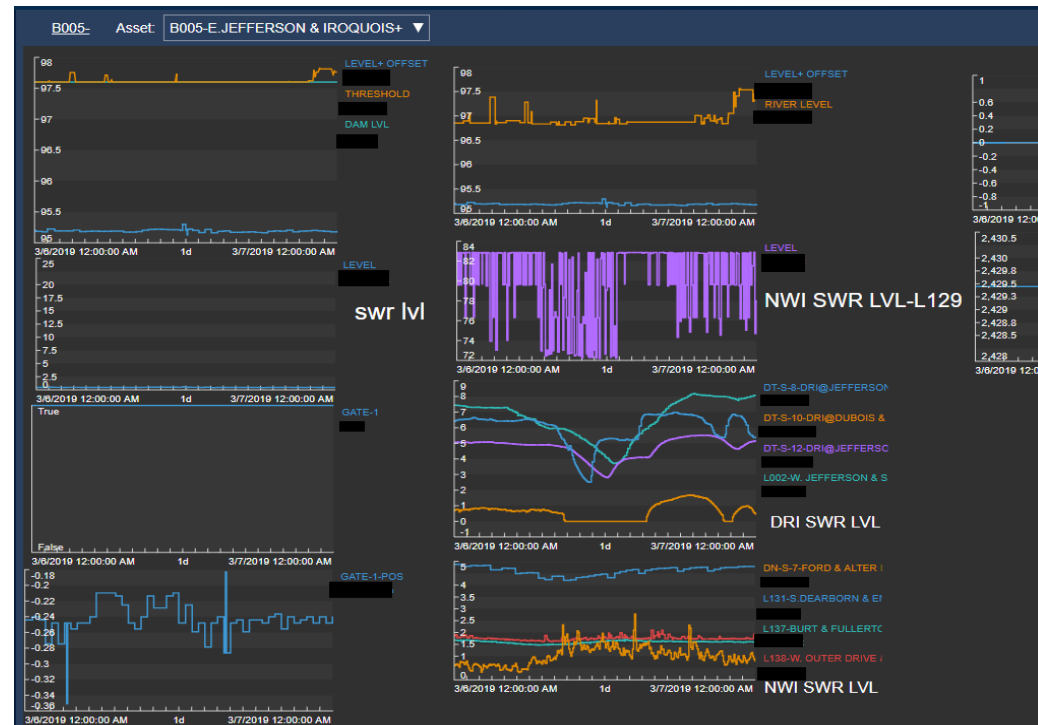


# PI Architecture: 2019



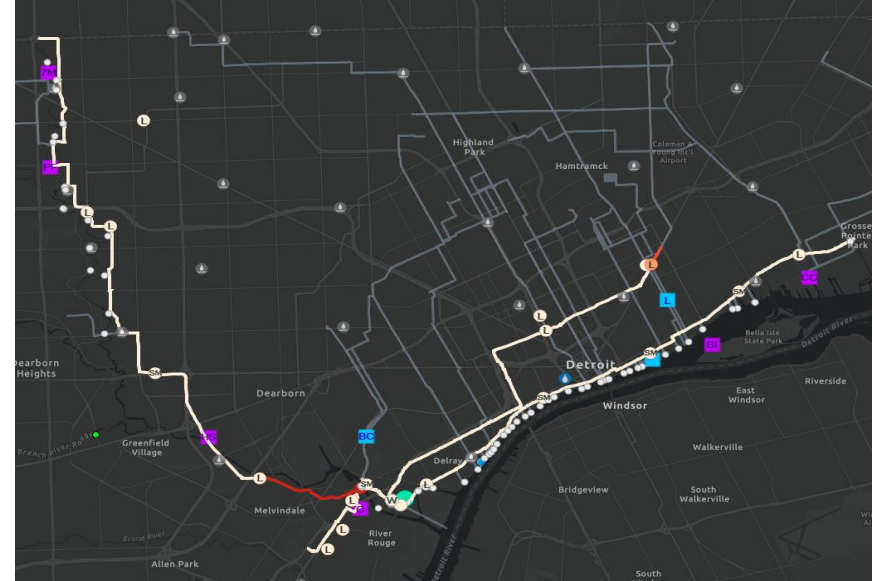
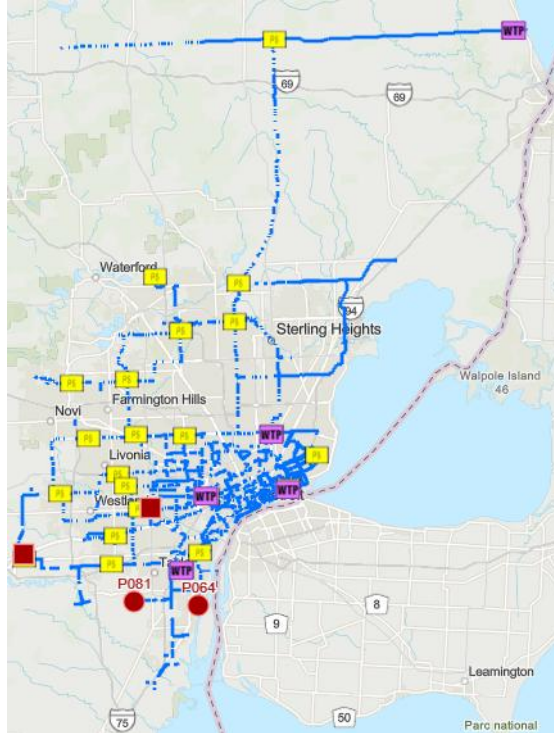
# Challenge

- PIVision:
  - detailed view of specific site
- Better visualization was needed for understanding the whole system





# Solution: live GIS Map



# Solution: Continue

## ➤ PI GIS Integrator

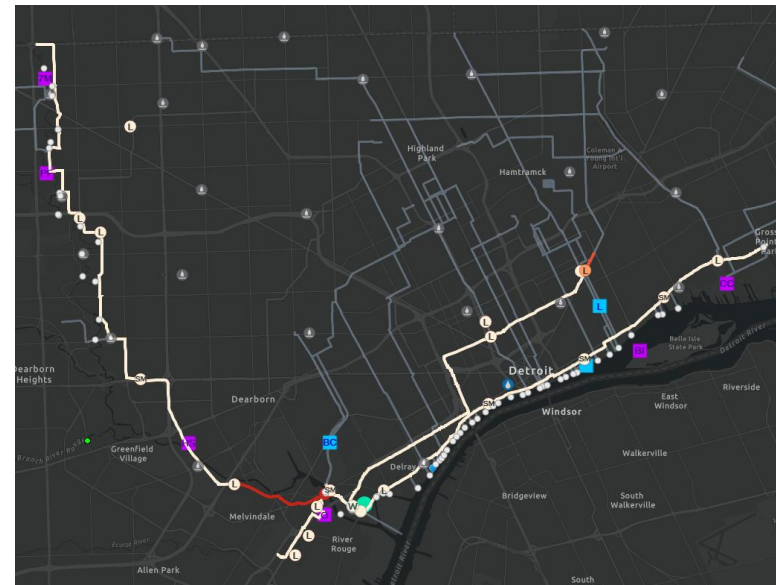
- Spatial visualization
- Integration of real-time data with GIS
- Accessibility through desktop and mobile devices
- Optimization of water and wastewater operations

# GIS for Sewer Services

- 76 suburban communities and City of Detroit
- Heavy rains results in partially Treated or untreated water releasing into the river.
  - For better operations during this time, a wet weather map was developed to optimize the wastewater operations.

# Sewer Services: Wet Weather Map

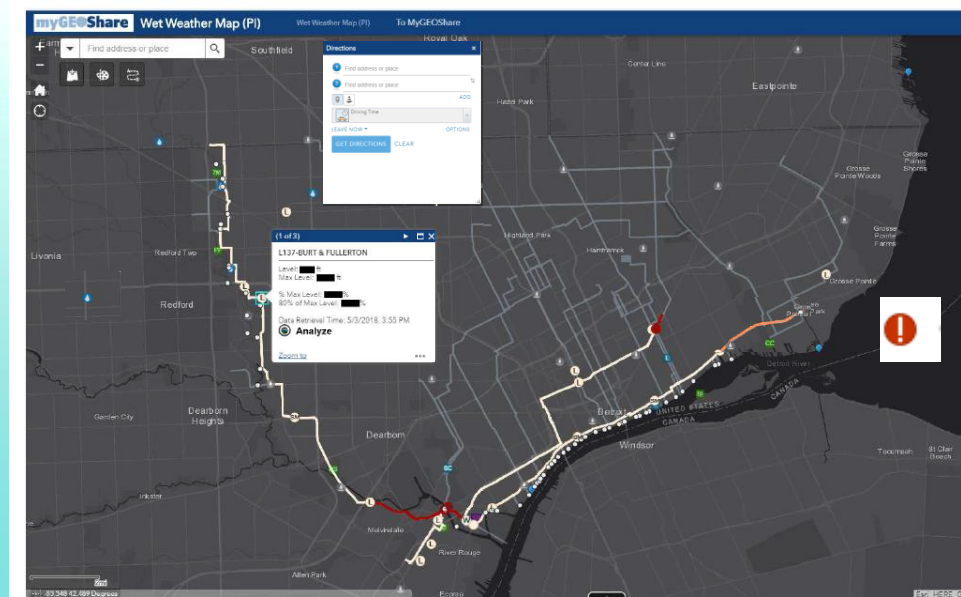
- Wet Weather Map Project Team
  - GLWA Systems Control and IT Department
- Softwares:
  - PI AF
  - PI GIS Integrator
  - ArcGIS
- Displays real-time data of remote sites along three major interceptors



# Sewer Services: Wet Weather Map

## ➤ Features:

- Pop-up box with attribute information
- Interceptor segments' capacity
- Outfall sites discharging
- Raining
- Forecasted precipitation
- Driving directions
- Mobile app



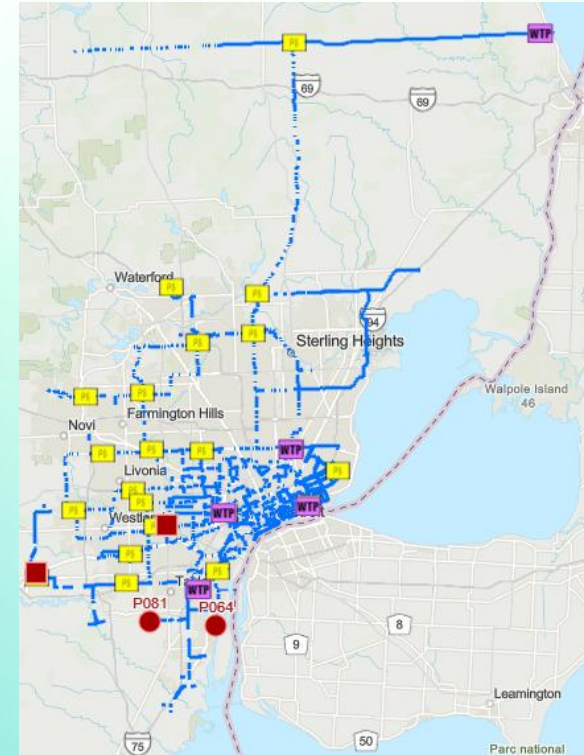
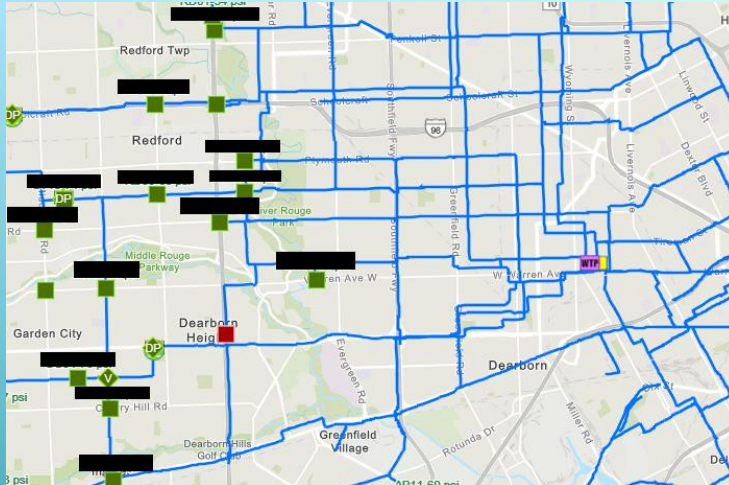


# Water Services

- Includes City of Detroit and approx. 100 suburban communities
  - 4 million people
  - 40% of the state
- For better understanding and operations, a Fresh Water Map was developed.

# Water Services: Fresh Water Map

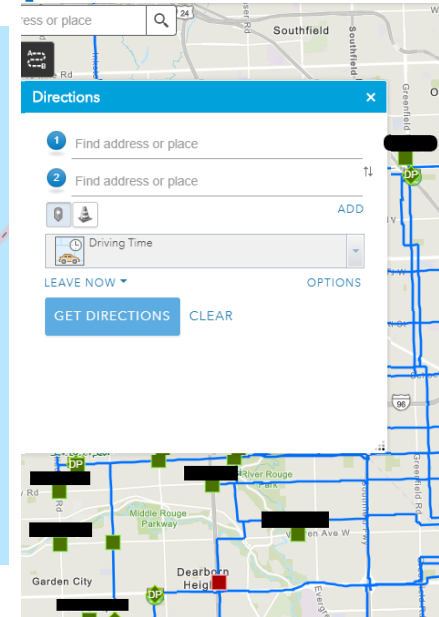
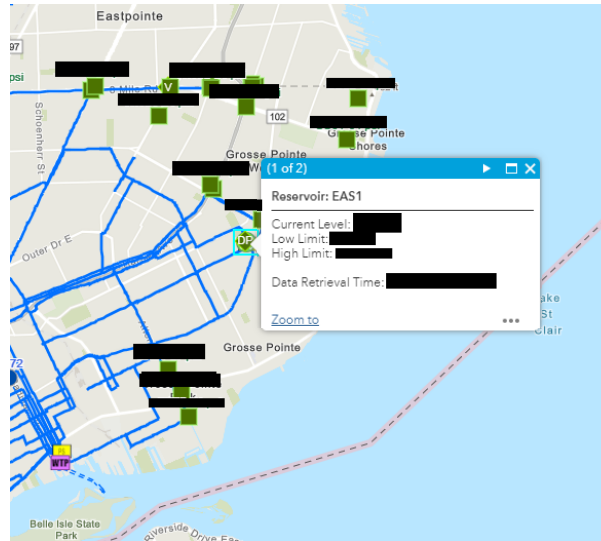
- Displays Facility and Remote Sites Data along the transmission lines on a GIS Map



# Water Services: Fresh Water Map

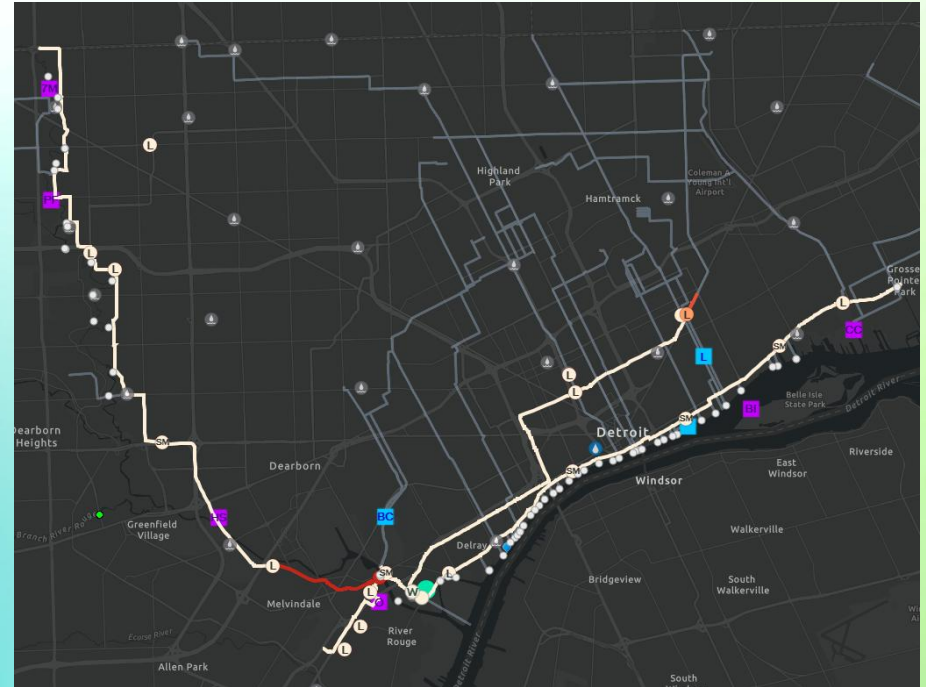
## ➤ Features:

- Pop-up box with attribute information
- Alarms
- Driving directions



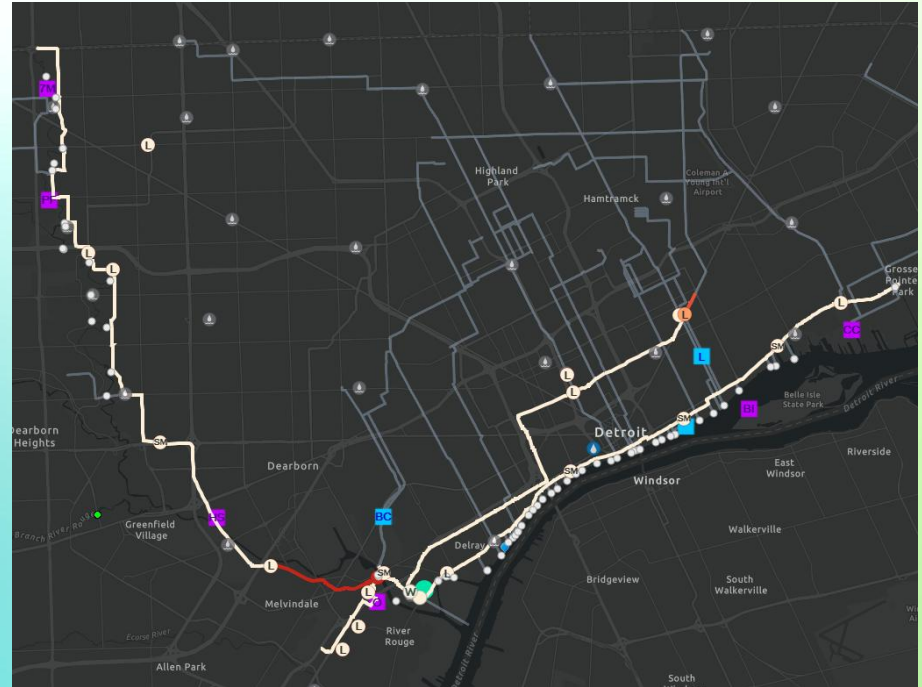
# Benefits: Wet Weather Map

- View of the overall sewage system on one monitor
- Forecasted NOAA rain data.
- Operating Retention Basins and Plants based on the Interceptors.



# Benefits: Wet Weather Map cont.

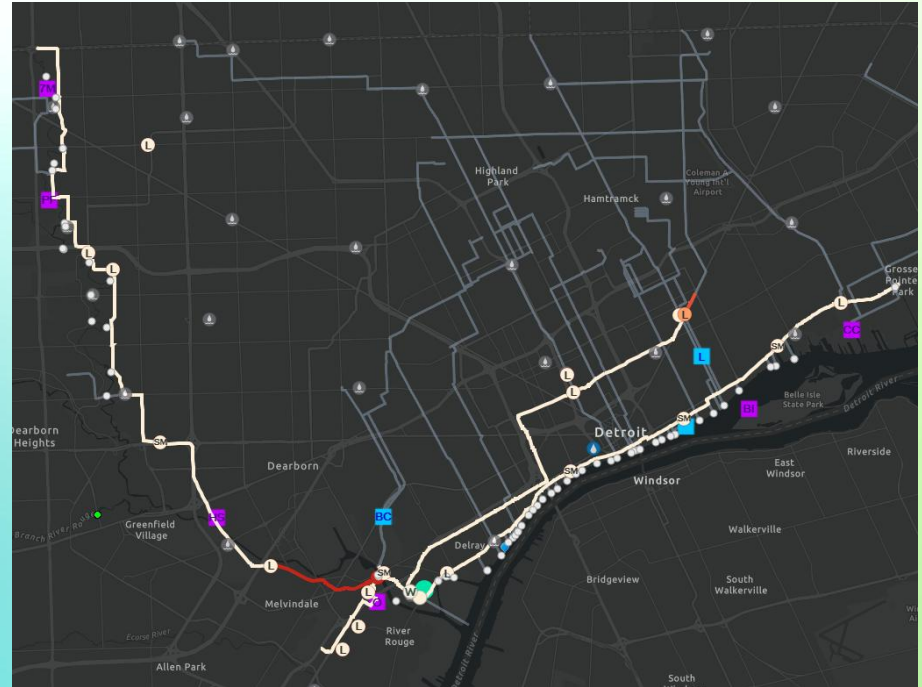
- Help our technicians with verifying that Calibration is done correctly.
- How a specific site affects the whole system.





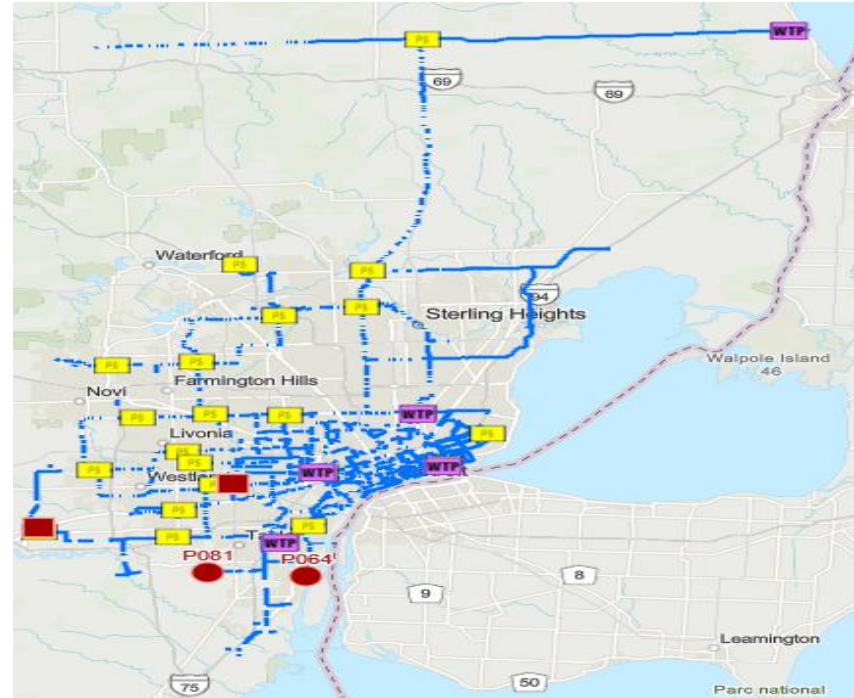
# Benefits: Wet Weather Map cont.

- Help operator hold sewer water in the interceptors to reduce outfalls.
- Reduced number of CSO Outfalls.
- Reduced the volume of CSO Outfalls.



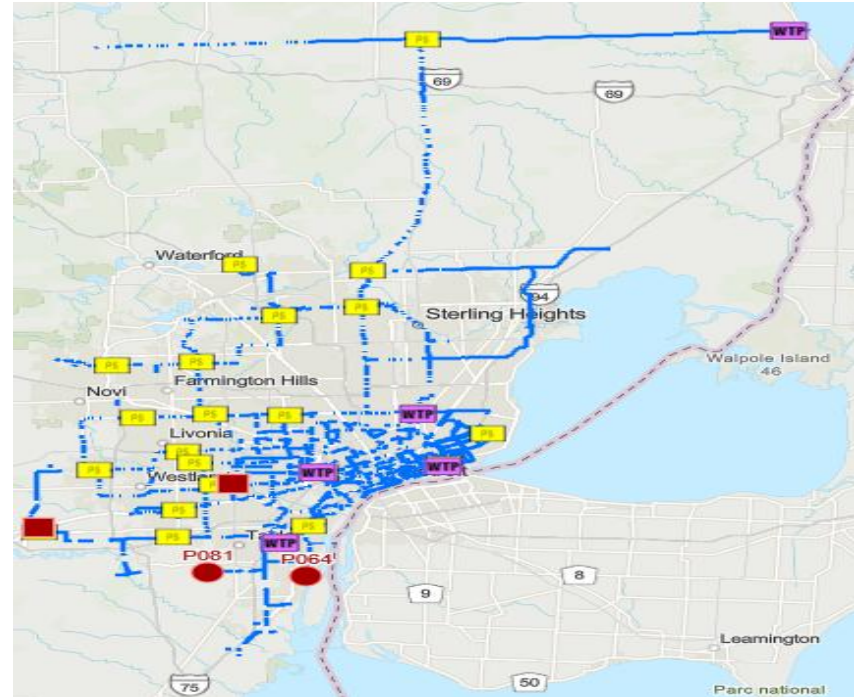
# Benefits: Fresh Water Map

- Displays PI and GIS Data on one monitor.
- Better organization for site visit(technicians)
- Maintaining Good water pressure in the system(Operator)



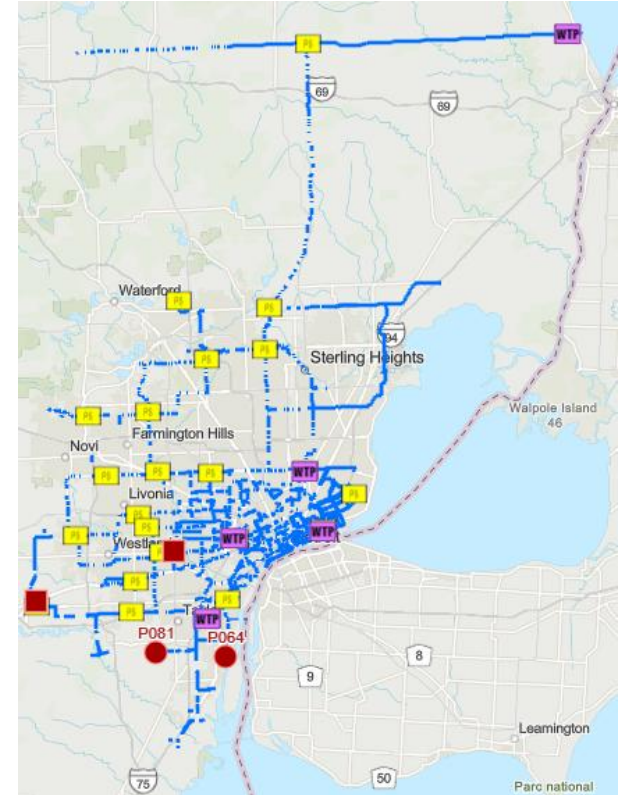
# Benefits: Fresh Water Map cont.

- Better load distribution across stations.
- Planning daily work schedule.
- View for upper management on the business side



# Benefits: Fresh Water Map cont.

- Improve the efficiency of operation of our pumps
- Improved the Response Time to system demands.
- Reduced the main breaks



# Great Lakes Water Authority



## CHALLENGE

A better understanding of the whole system in relation to day to day operations of the Water and Sewer Systems.

- A better visualization would give a faster response and understanding of the system.

## SOLUTION

GIS Real Time maps that provide Spatial Visualization of the whole system.

- Softwares Used: PI GIS Integrator, PI AF, and ArcGIS.

## RESULTS

Improved communication and user engagement among inter-departments. Enables GLWA to host other community's data.

- Since becoming live, users have increased by 25% to date.
- Response Time has improved for Regulatory Reporting.
- Was awarded GovTech 2018 Midwest Technology: Operations Award Winner
- Next Goal is to add more PI attributes in the Maps and to better utilize the historical Map.



# Thank You

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# Questions?

Please wait for  
the **microphone**

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**name & company**



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