GeoViewer

Your Asset Management Solution

This is not an ADB material. The views expressed in this document are the views of the author/s and/or their organizations and do not necessarily reflect the views or policies of the Asian Development Bank, or its Board of Governors, or the governments they represent. ADB does not guarantee the accuracy and/or completeness of the material's contents, and accepts no responsibility for any direct or indirect consequence of their use or reliance, whether wholly or partially. Please feel free to contact the authors directly should you have queries.

Challenges Overview

- In many water utilities, assets are increasingly stressed from overuse, underfunding, and aging.
- Managing these assets, identifying assets most likely to fail, and getting real-time insights from your system are tasks that are hard to accomplish.
- Practical, advanced techniques for better managing physical assets have been developed and GeoViewer software can help utilities build a Real-time Digital Twin Asset Management solution.

Who We Are

- Founded in 1992, and headquartered in Redlands, California, Nobel Systems Inc. has enjoyed relationships with our clients across the world and encompassing thousands of users. Many of our relationships with our customers have lasted over a decade.
- With 25+ years working in the water industry, Nobel Systems continues to deliver real-world solutions that integrate with your existing network and devices.
- Our cloud-hosted SAAS-based Asset Management solutions called GeoViewer provide easy access to your data with minimal training and no additional software.

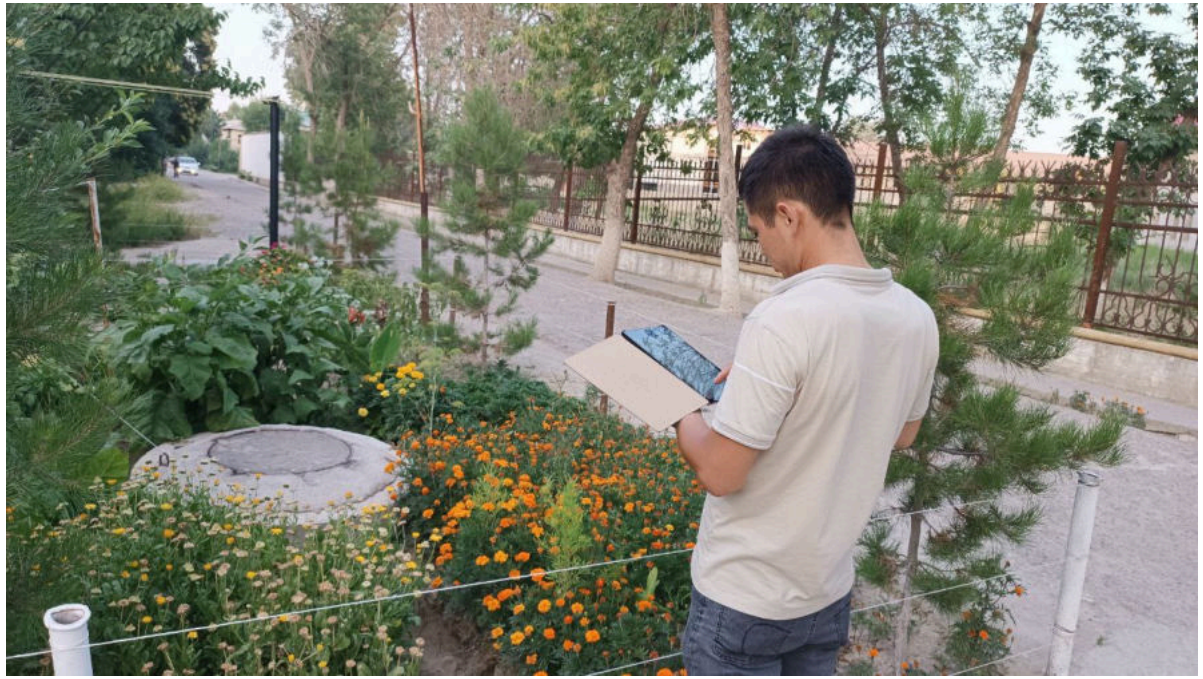
What is GeoViewer?

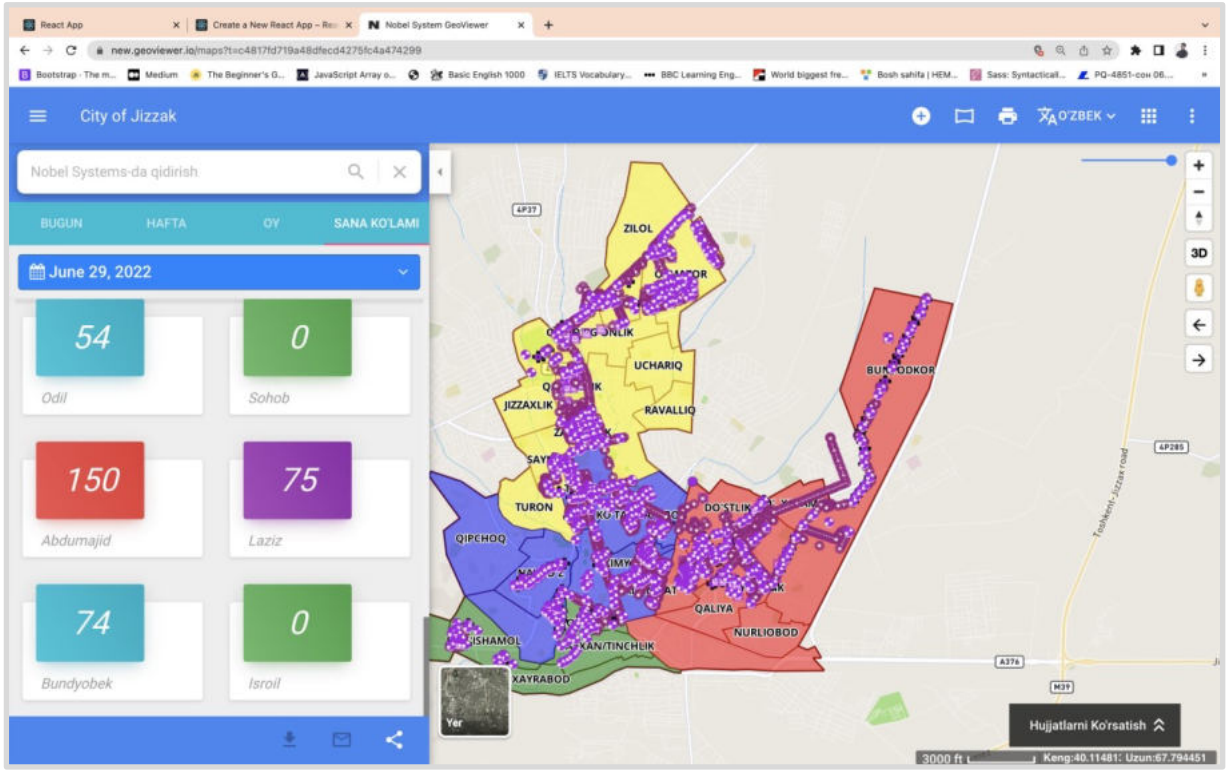
- A Real-Time, Total Operations Management Solution for Utilities
  It isn't just an Asset Management System.
- It creates a DIGITAL TWIN model of the network by utilizing:
  - → **Water GIS data**
  - → **IoT sensor data**
  - → **Maintenance data easily gathered from GeoViewer mobile and web apps**
  - → **Calibrated hydraulic models and machine learning algorithms to output unique insights**
- A proven solution with customers in United States, Philippines, and Uzbekistan

Create a Computer Mapping System (GIS)

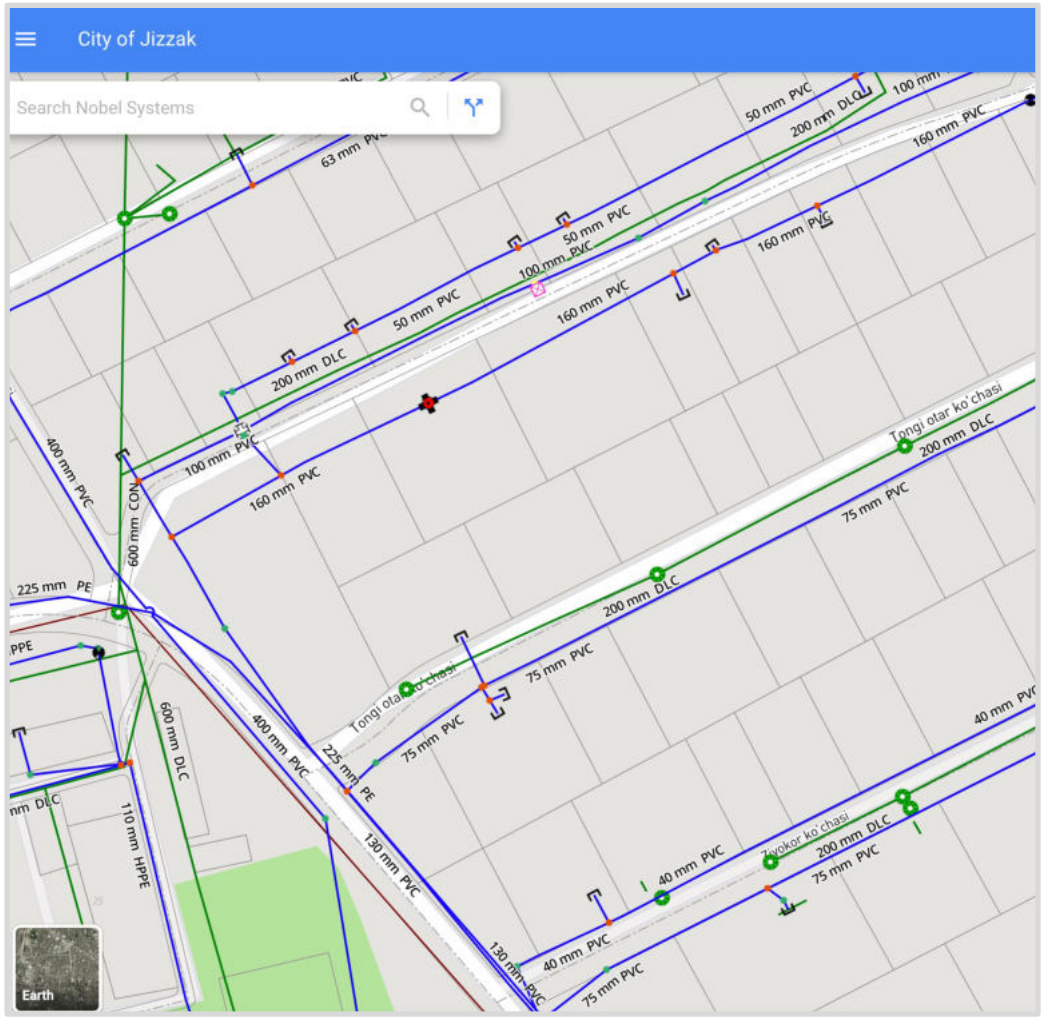
1) The first step in any remote monitoring of water utilities is to create a GIS system of the utility. Nobel Systems has several years of experience in building such a system especially in countries such as the Philippines and India where data is not easily available.
2) Digitize the parcels from satellite images and transfer that data to a tablet.
3) The field staff take the tablet in the field and start to capture meters, valves, and other assets. The data is automatically transferred to the GIS and the staff start connecting the dots to build the water network.
4) This is again field verified to check for accuracy. We can also import existing data if available into the system.
5) Finally, the map is created.

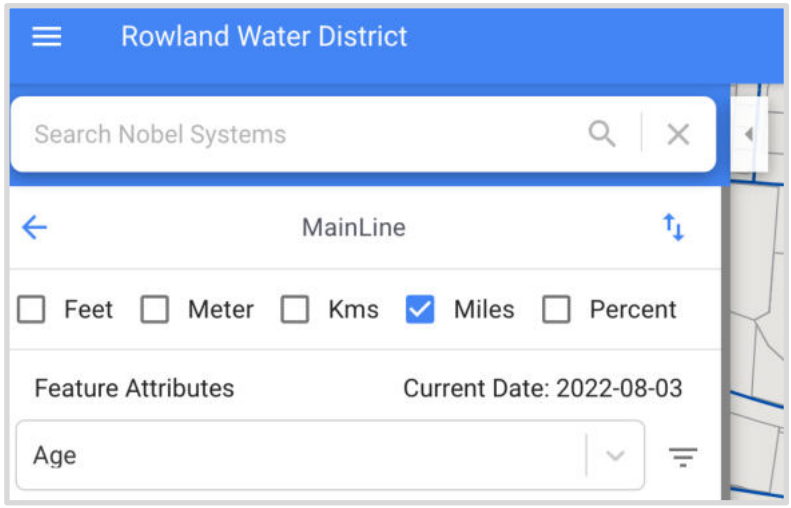
City of Jizzak, Uzbekistan Collecting Field Data




City of Jizzak
Nobel Systems-da qidirish
BUGUN
HAFTA
OY
SANA KO'LAMI
June 29, 2022
54
Odil
0
Sohob
150
Abdumajid
75
Laziz
74
Bundyobek
0
Isroil
ZILOL
UCHARIQ
JIZZAXLIK
RAVALLIQ
TURON
QIPCHOQ
QALIYA
NURLIOBOD
XAYRABOD
3D
Hujjatlarni Ko'rsatish

Final GIS Product

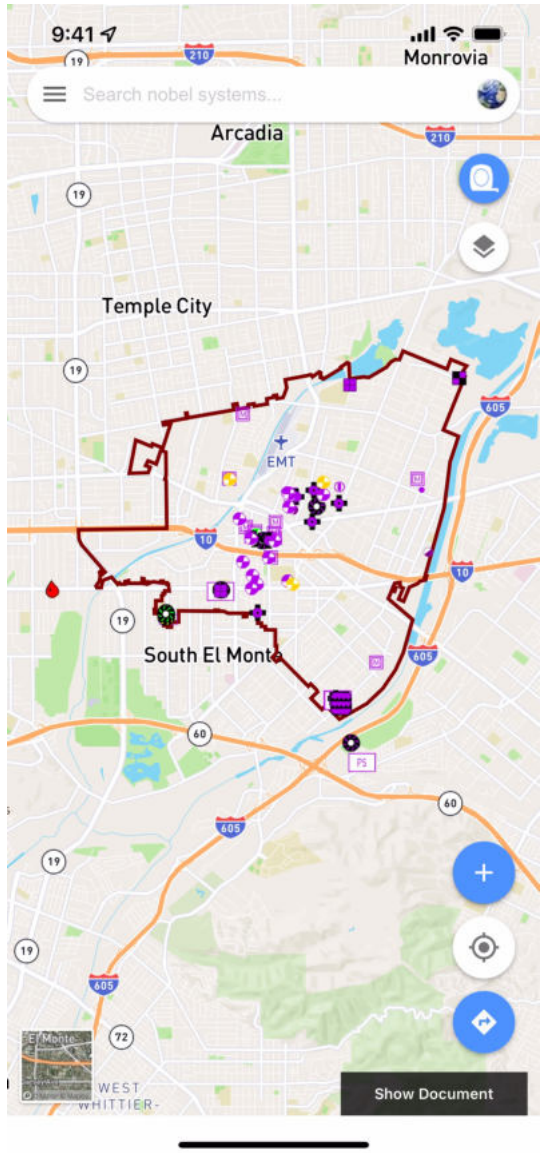




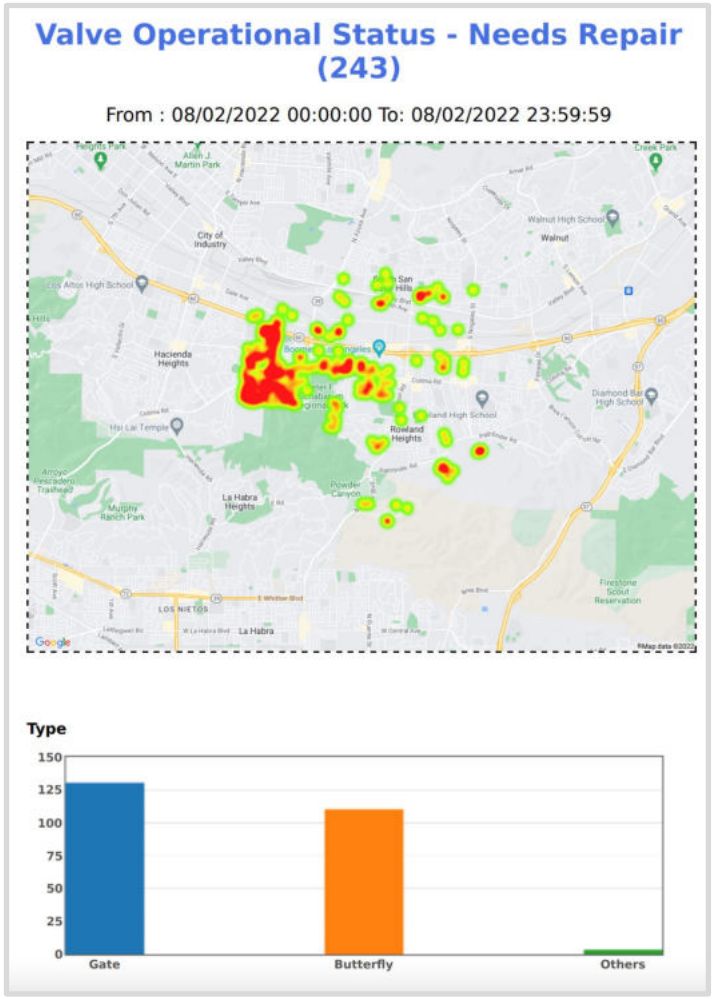
Preventative Maintenance and Work Orders

- **Preventative Maintenance (PM)** is a key component within an Asset Management strategy.
- Preventative Maintenance ensures peak efficiency and minimizes deterioration of a piece of equipment.
- Once the GIS has been completed, utilities will use GeoViewer for preventative maintenance:
  - → Maintain assets on a schedule
  - → Flag assets for repair
  - → Create Work Orders to fix assets

Sample Preventative Maintenance of Valves



Variety of Reports and Business Intelligence



El Toro Water District

OPERATIONS DEPARTMENT
O & M PROGRAM
TRACKING REPORT

Date: From : 03/01/2021 00:00:00 To: 04/01/2022 23:59:00

TRANSMISSION & DISTRIBUTION DIVISION

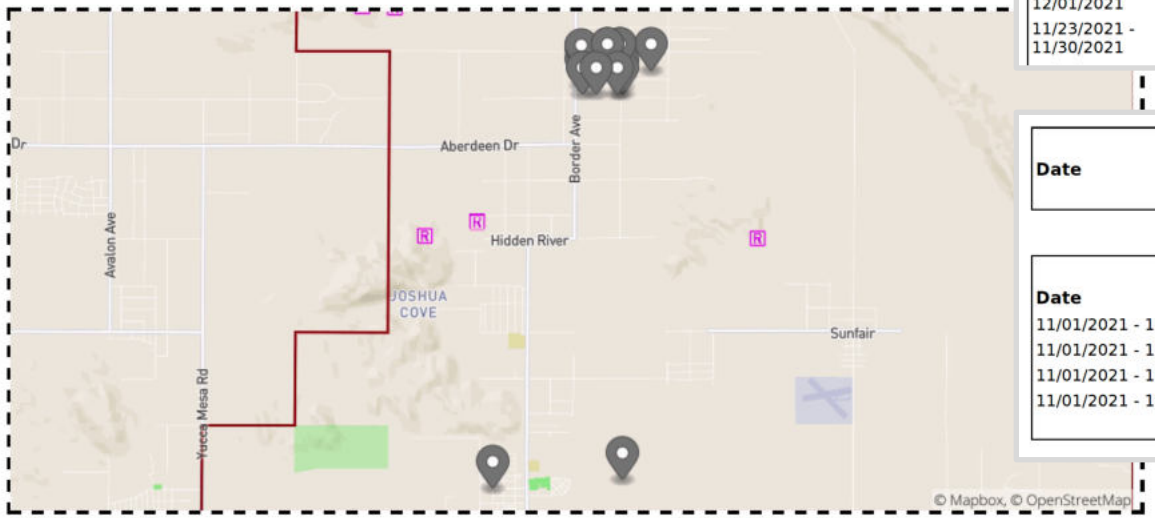
Program	Total For This Date Range	Annual Total
Arterial		
Mainline Valves	56	56
Fire Hydrants Valves	2	2
Fire Service Valve	1	1
Distribution		
Mainline Valves	700	929
Fire Hydrants	430	564
Fire Service Valve	8	10
Valve Cans		
Adjusted/ Replaced	18	20
Cleaned	0	0
Valves		
Replaced	19	22
Repaired	16	17
Fire Hydrants		
Repairs	38	40

CIP Tracking Reports

Printed on:12/2/2021

CIRP Tracking

PROJECT AREA



Reporting Period	2021-11-01 - 2021-12-31
Project No.	ALL PROJECTS
Length of Water Main Replaced	2100
Subtotal	$56,758.00
Cost/Linear Foot	$27.03

INVENTORY EXPENSED

Date	INVENTORY USED	Unit Cost	Qty	Cost
11/04/2021 - 11/04/2021	01-C0301285 (CLAMP REPAIR 1' IP X 3')	$50.00	1	$50.00
11/02/2021 - 12/01/2021	CIRP100003 (8" DR18 ULTRA BLUE)	$5.88	2120	$12,465.60
11/29/2021 - 12/01/2021	CIRP100004 (6" C909 DR18 ULTRA BLUE)	$4.10	140	$574.00
11/23/2021 - 11/30/2021	CIRP100006 (1" COPPER TUBING K SOFT)	$3.78	600	$2,268.00

FUEL EXPENSED

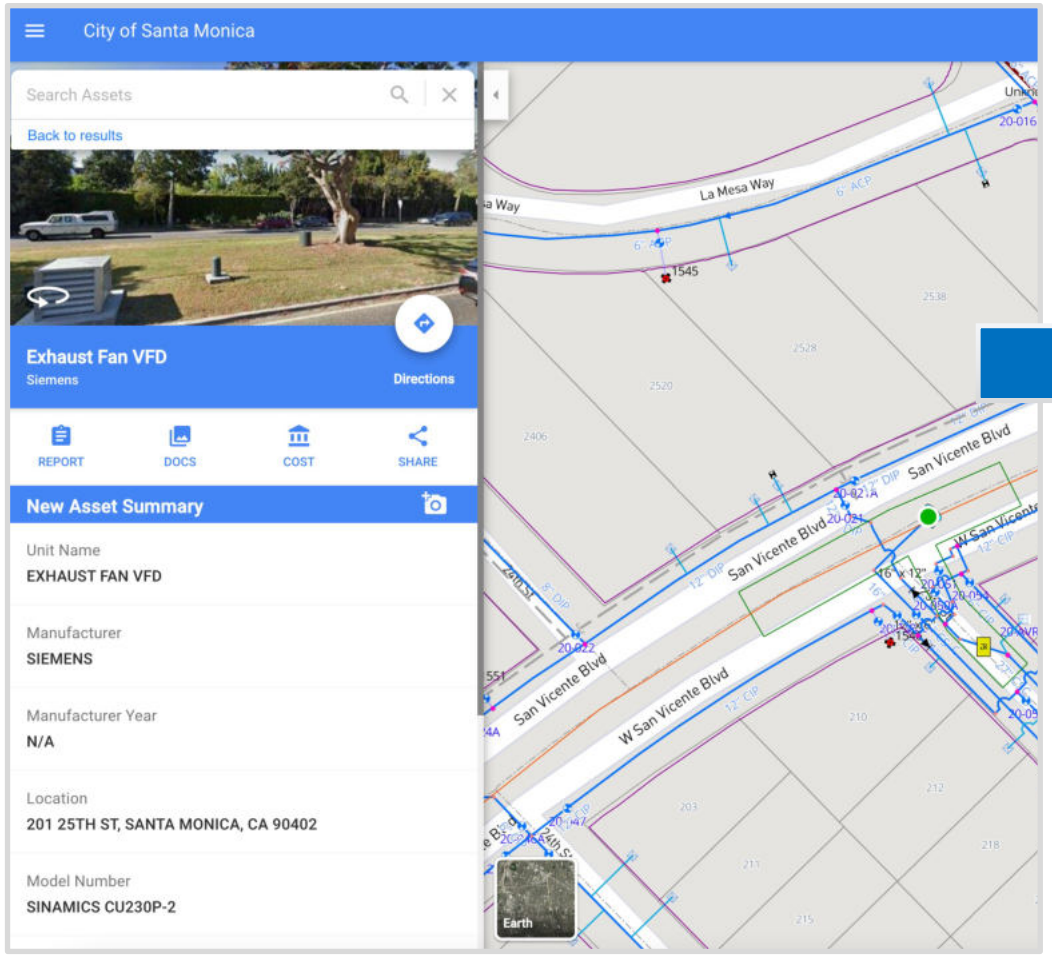
Date	Equipment Name	Mileage	Hours	Total
			Total	$0.00

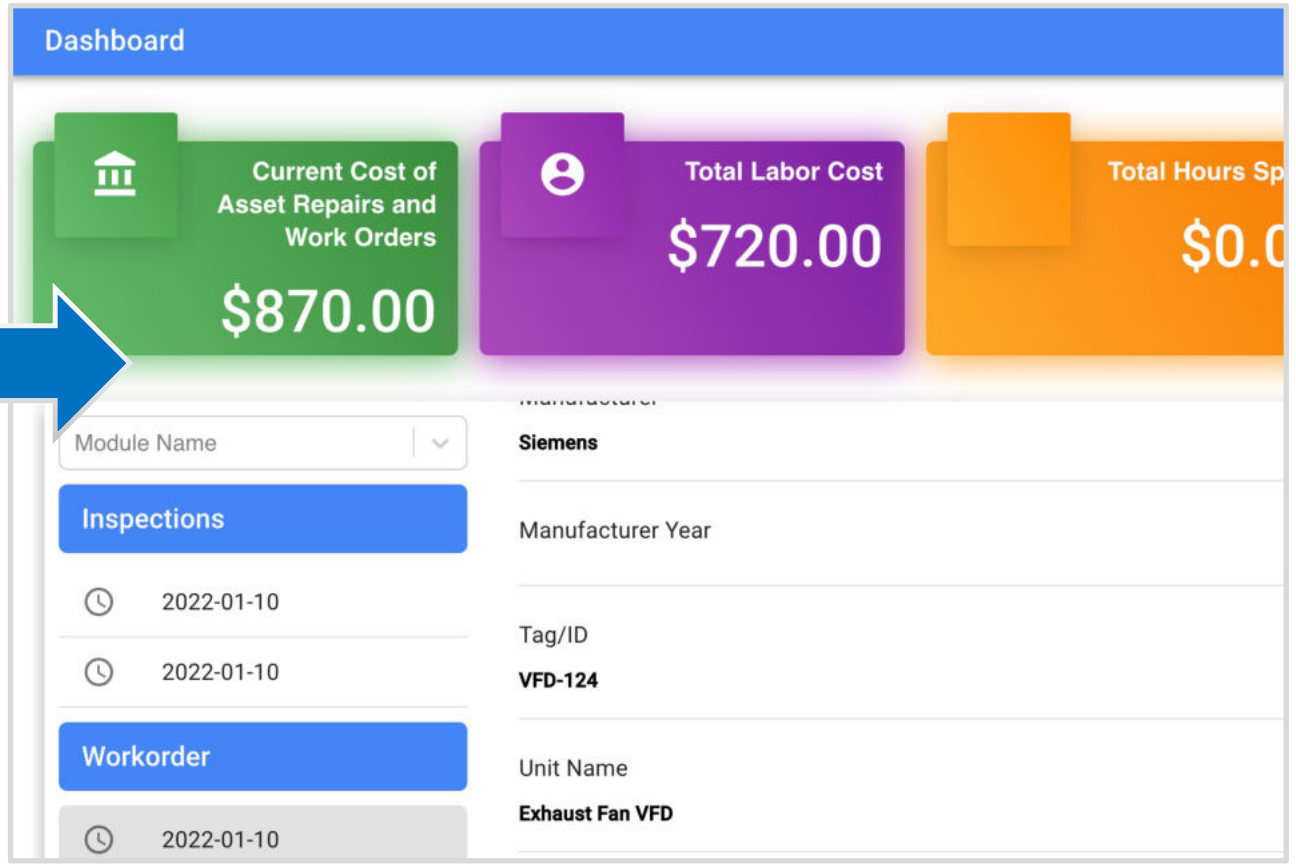
LABOR EXPENSED

Date	Employee Name	Qty of Hours	Cost
11/01/2021 - 12/01/2021	Brandon Warner	160	$5,864.96
11/01/2021 - 12/01/2021	Justin Tuttle	170	$0.00
11/01/2021 - 12/01/2021	Micah Nazario	170	$4,520.47
11/01/2021 - 12/01/2021	Spencer laymon	170	$4,095.30
	Total	670	$14,480.73

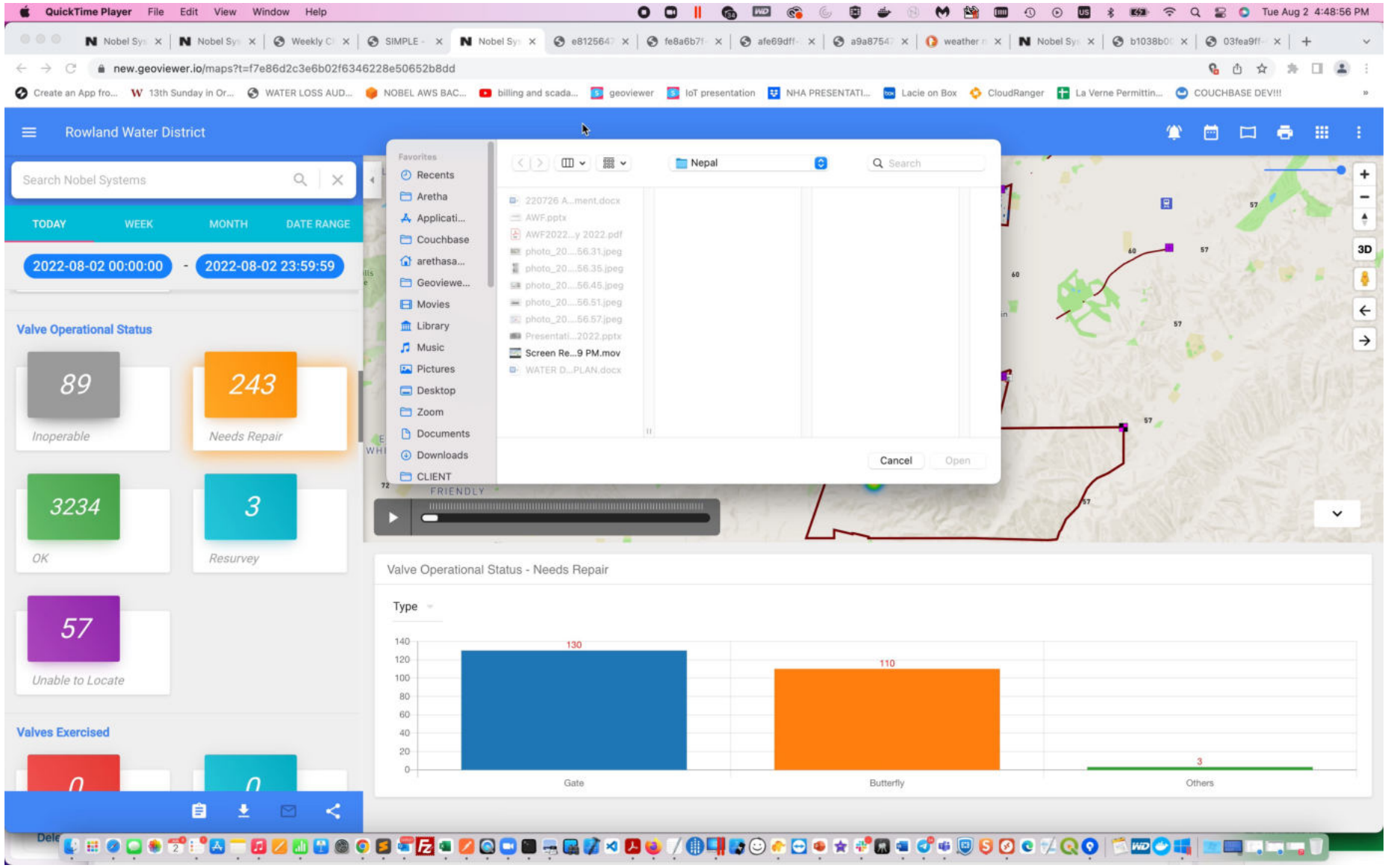
GeoViewer allows the utility to track CIP mainline replacement projects.
After the pipes are replaced, new pipe details will be updated into the GIS.

All Costs and History of Inspections Link to an Asset

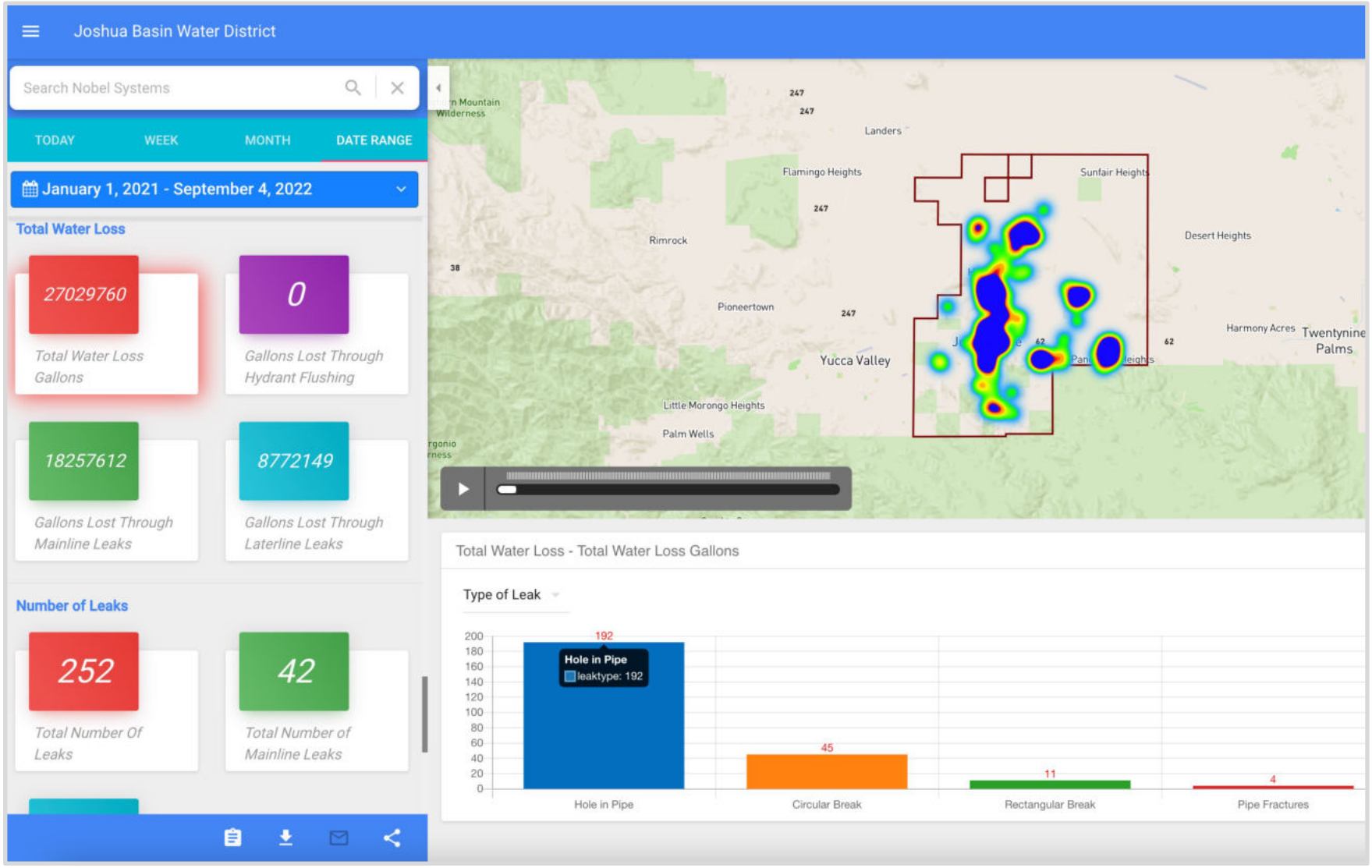




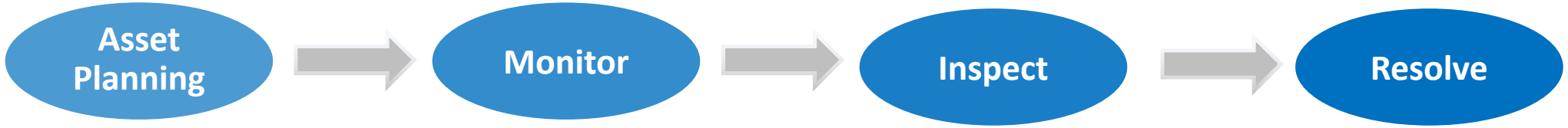
Show Assets Likely to Fail



Show Leak and Work Order Reports

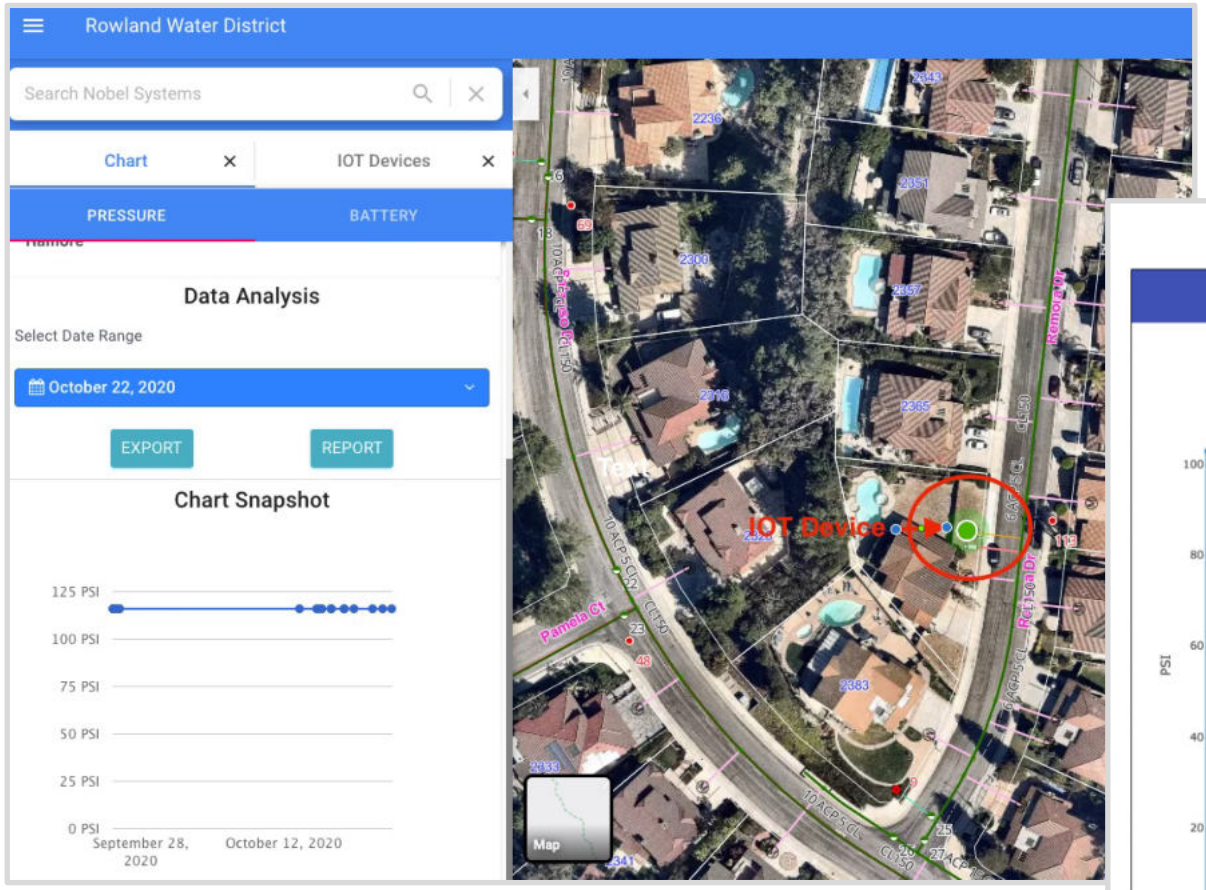


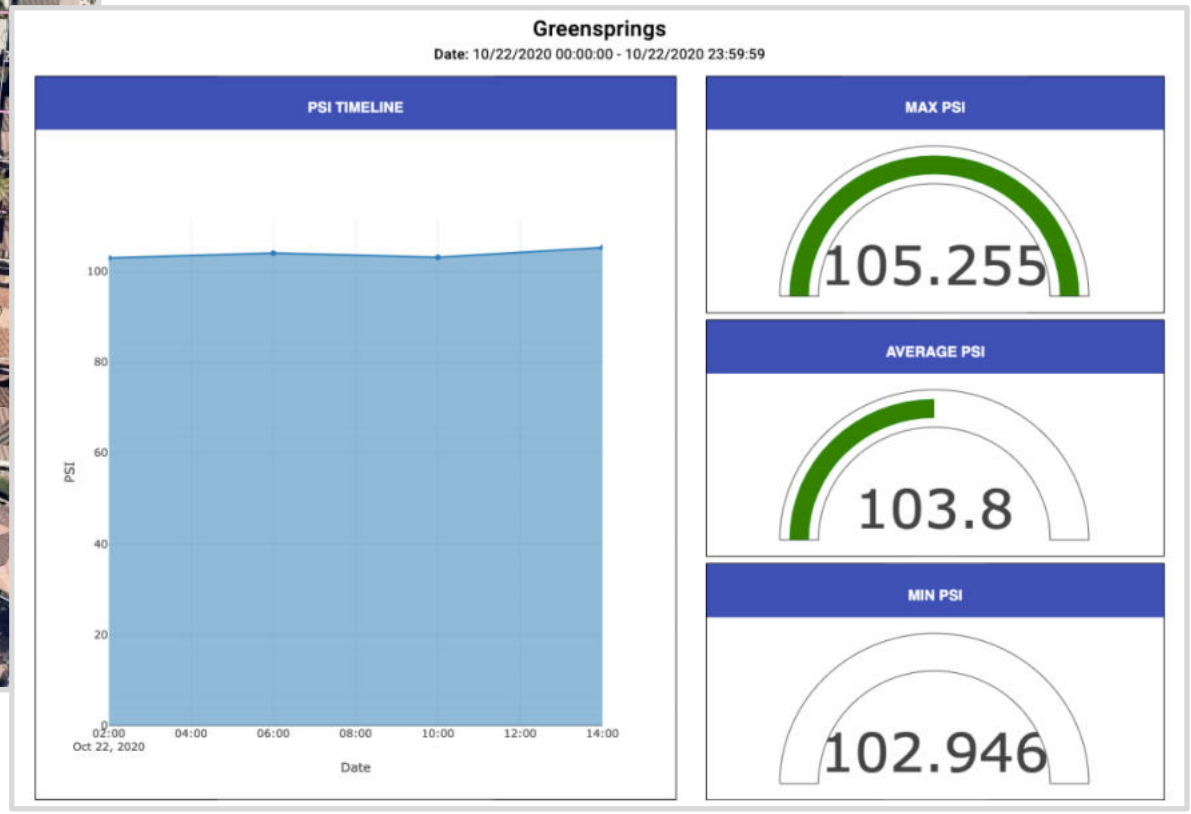
Asset Management – Real Time Monitoring



- Nobel Systems provides its unique patented water quality/water level and pressure monitoring system
- This is based on the latest Internet of Things (IoT) technology
- This is an easy to install cellular battery powered device
- Pressure data is transmitted every three seconds in real time

Show Real-time Pressures in Charts

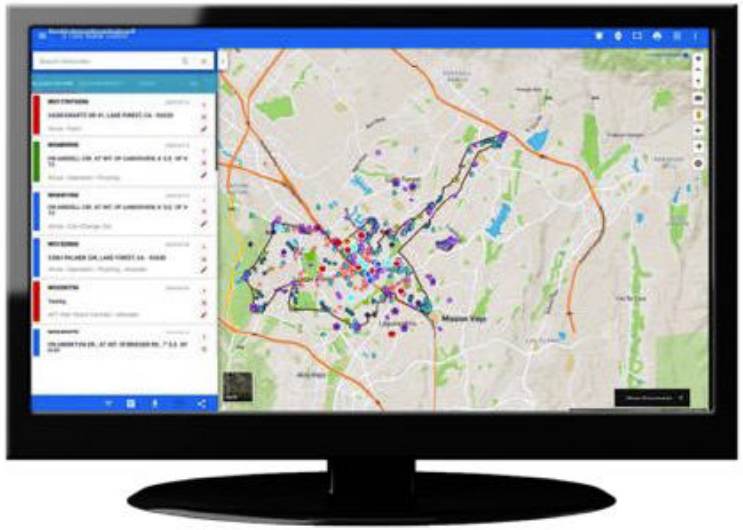


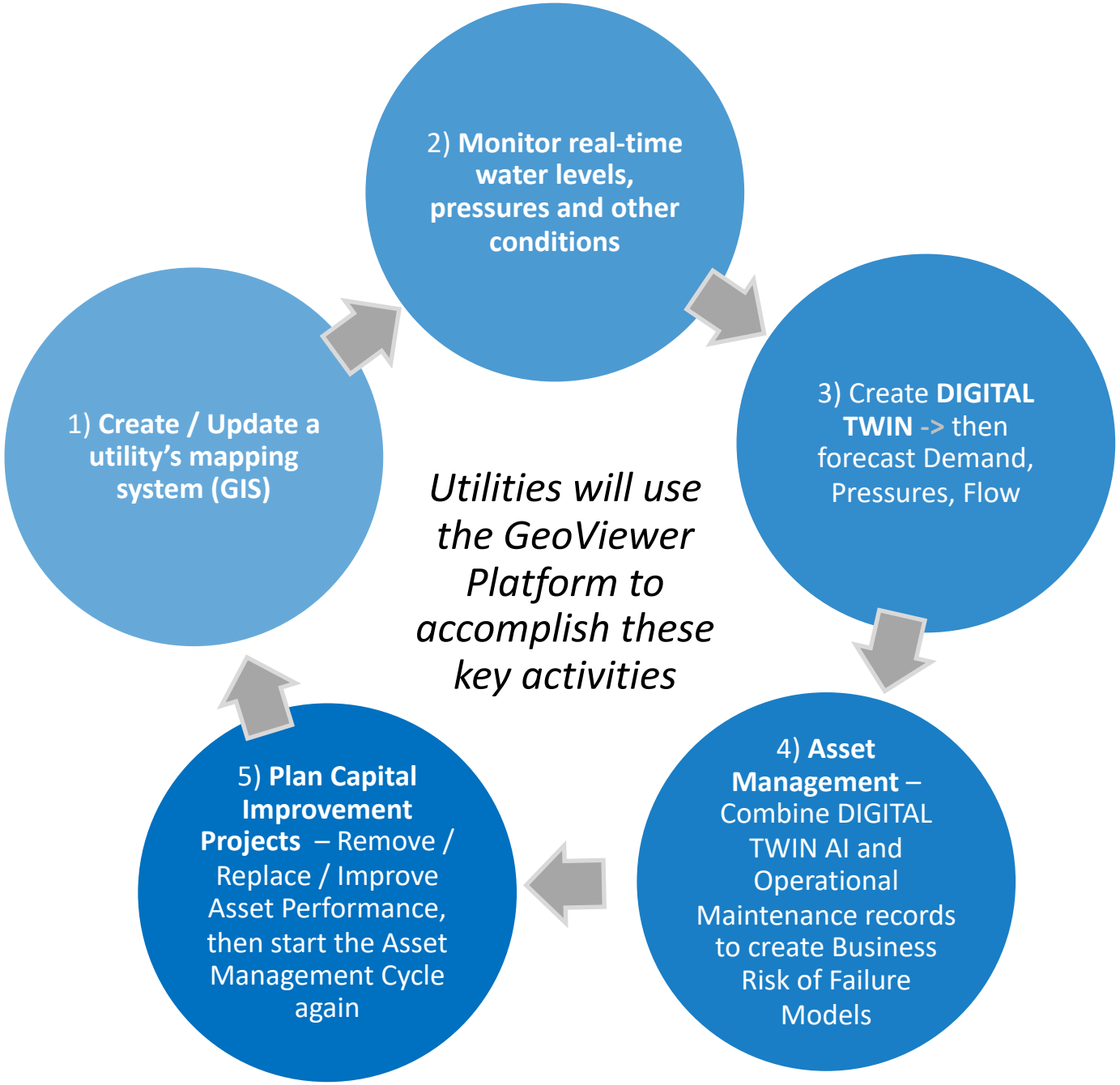


Rowland Water District – Inside Air Release Can

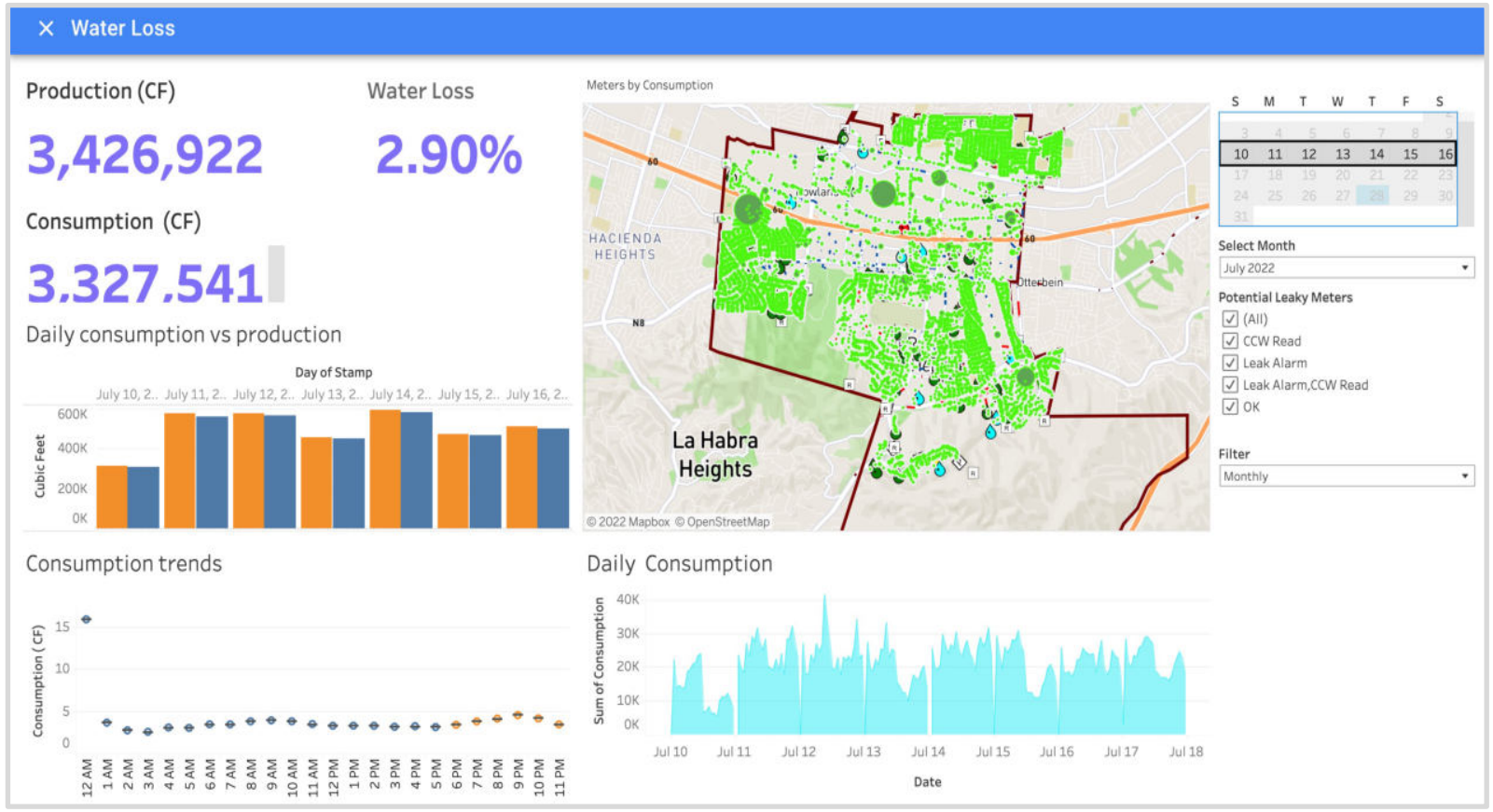
Valley County Water – Meter 10 Feet Underground

IoT Plus Work Orders:
Digital Twin in Action



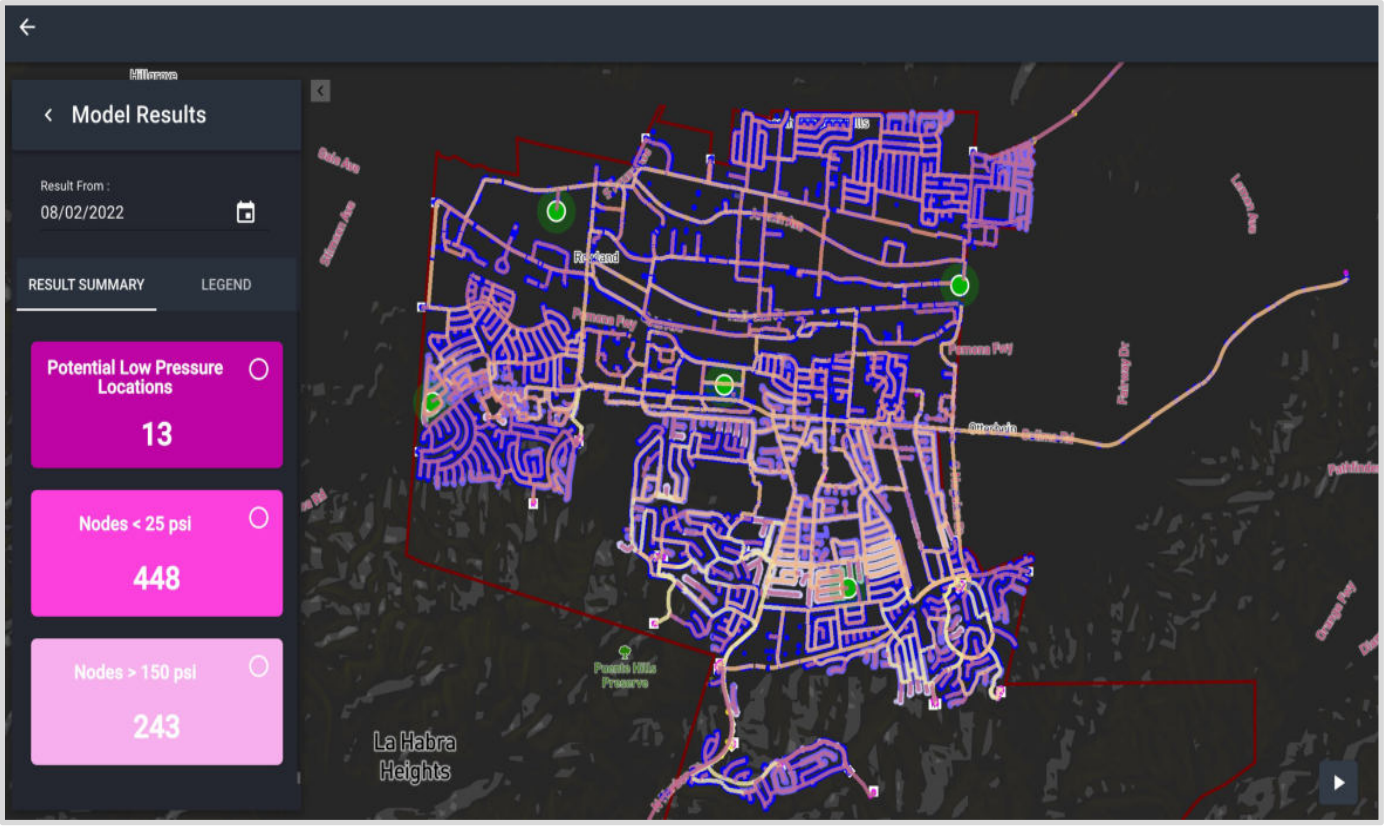


Real-time Asset Management:
Latest Consumption & Production Trends



- Visualize all the asset data on GeoViewer
- GeoViewer integrates with AMI and SCADA to help provide useful insights
- Pipes, pumps, meters, and tanks can be monitored in single GeoViewer platform using this integration
- Get operational analytics to make effective asset decisions

Real-time Modeling: Integrate SCADA, Billing Consumption Data into Real-time Model



- GeoViewer creates a real-time hydraulic model to replicate each asset operations in real world.
- It is a digital representation of assets.
- Using the model, a user can create real-time scenarios for the following:
  - → Mainline shutdowns
  - → Demand changes
  - → Flow analysis

GeoViewer: Your Asset Management Solution

GeoViewer answers key questions:

- ***What is the current state of my assets?***
  Preventative Maintenance and GIS Data Collection will allow the utility to know all information about assets.

- ***How do my assets fail? What is the likelihood of failure?***
  What does it cost to repair?
  GeoViewer through its **Business Intelligence Module** can display cost of repairs, assets likely to fail, and asset age.

GeoViewer: Your Asset Management Solution

- ***What is the demand for my services from my stakeholders?***
  We can build a Digital Twin of your system by utilizing a hydraulic model that is based on real-time consumption and production data.
- ***What is the likelihood of failure?***
  Machine learning through data input from hydraulic modeling, SCADA, billing consumption and operational activities can inform utilities which pipes are likely to fail in the future.
- ***What are my best minimum lifecycle cost CIP and O&M strategies?***
  GeoViewer allows utilities to track CIP and O&M costs in real-time. Utilities can then plan CIP Projects, keep track of those project costs, and update the conditions and attributes of the new assets.

GeoViewer: Your Asset Management Solution

- We can track how urbanization and climate change impacts operational activities.
  - → ***How does the Flow Change?***
  - → ***How does the Production vs. Consumption patterns change?***
- We can save hundreds of hours of time with tracking operational activities and labor hours.
- We can show all high-risk assets on the map and build custom Business Intelligence for the utility.