Fusion of PI System and GIS in Dashboard Visualizations Provide Industry-Best Decision Insight

Ed Riegelmann, Chief Geospatial Officer
Stefan Orehovec, Spatial Technologist

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Agenda

- About Critigen
- How PI System and GIS Solve Business Challenges
- Example Client Solutions
- Key Processes for Successful GIS for PI Deployments
- Technology Improvements and Lessons Learned
- Benefits of PI System and GIS Together

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About Critigen

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About Critigen

Critigen is a Global Leader in Geospatial Integration

We help our clients *transform geography into action* to improve lives, increase transparency, and yield better business outcomes

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- Critigen has been mapping client assets since 1947, providing GIS solutions since 1987, and has been an OSIsoft Partner since 2014
- Critigen brings map-based, integrated GIS dashboards and mobility solutions to OSIsoft's operations intelligence and analytics

Critigen, OSIsoft and Esri

- The PI System by **OSIsoft** provides the ability to collect, analyze, and visualize large amounts of high-fidelity, time-series data from multiple sources and share that information with people and systems across all operations
- **Esri** is the world's largest maker of geographic information systems (GIS) software that allows users to combine mapping and analytics to reveal deeper insight into their data.
- **Critigen** is a GIS systems integrator. As an OSIsoft Integration Partner and an Esri Platinum Partner, Critigen is uniquely positioned to help organizations integrate their operational and spatial data to make better decisions, faster.

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How PI System and GIS Solve Business Challenges

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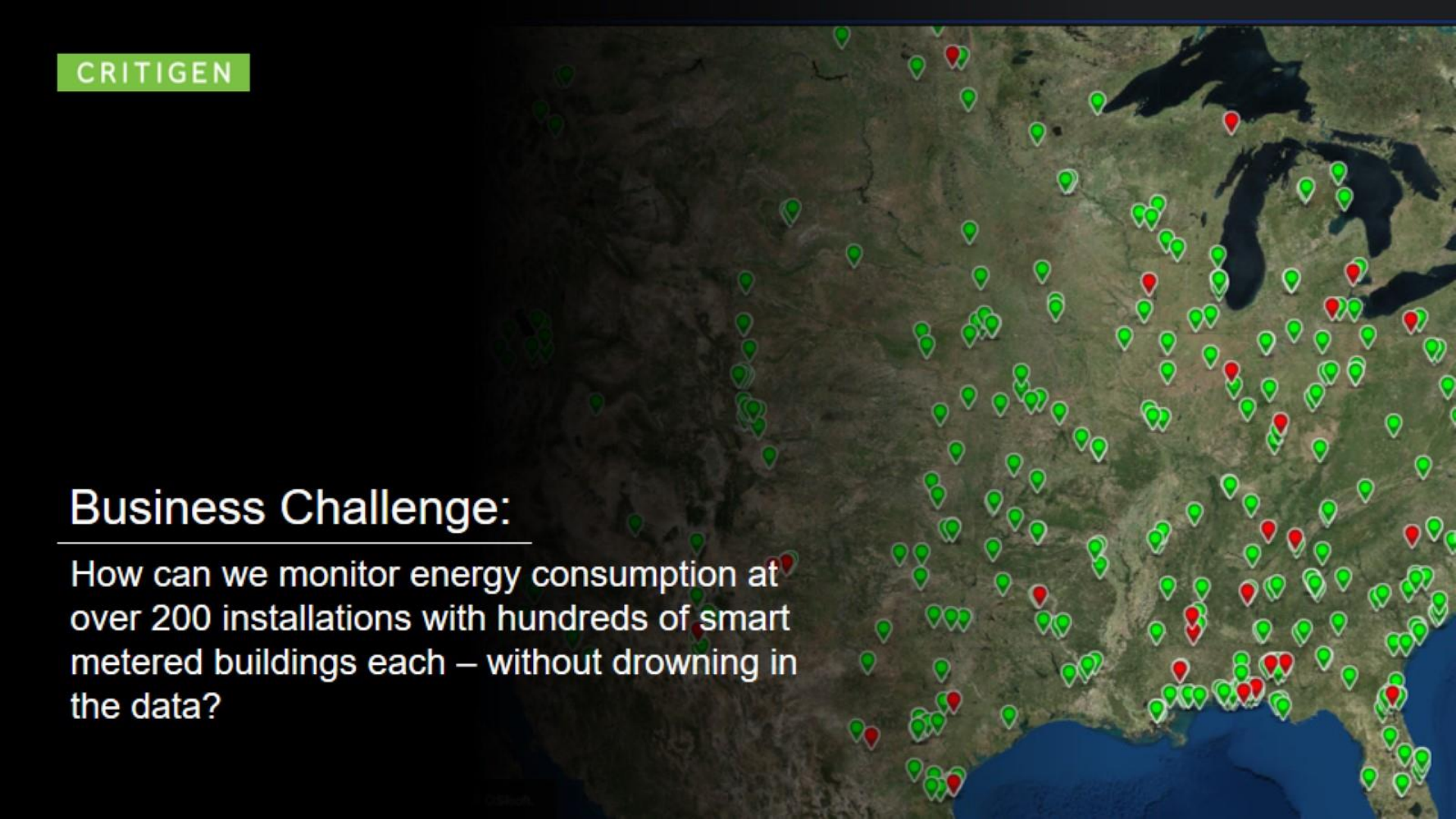
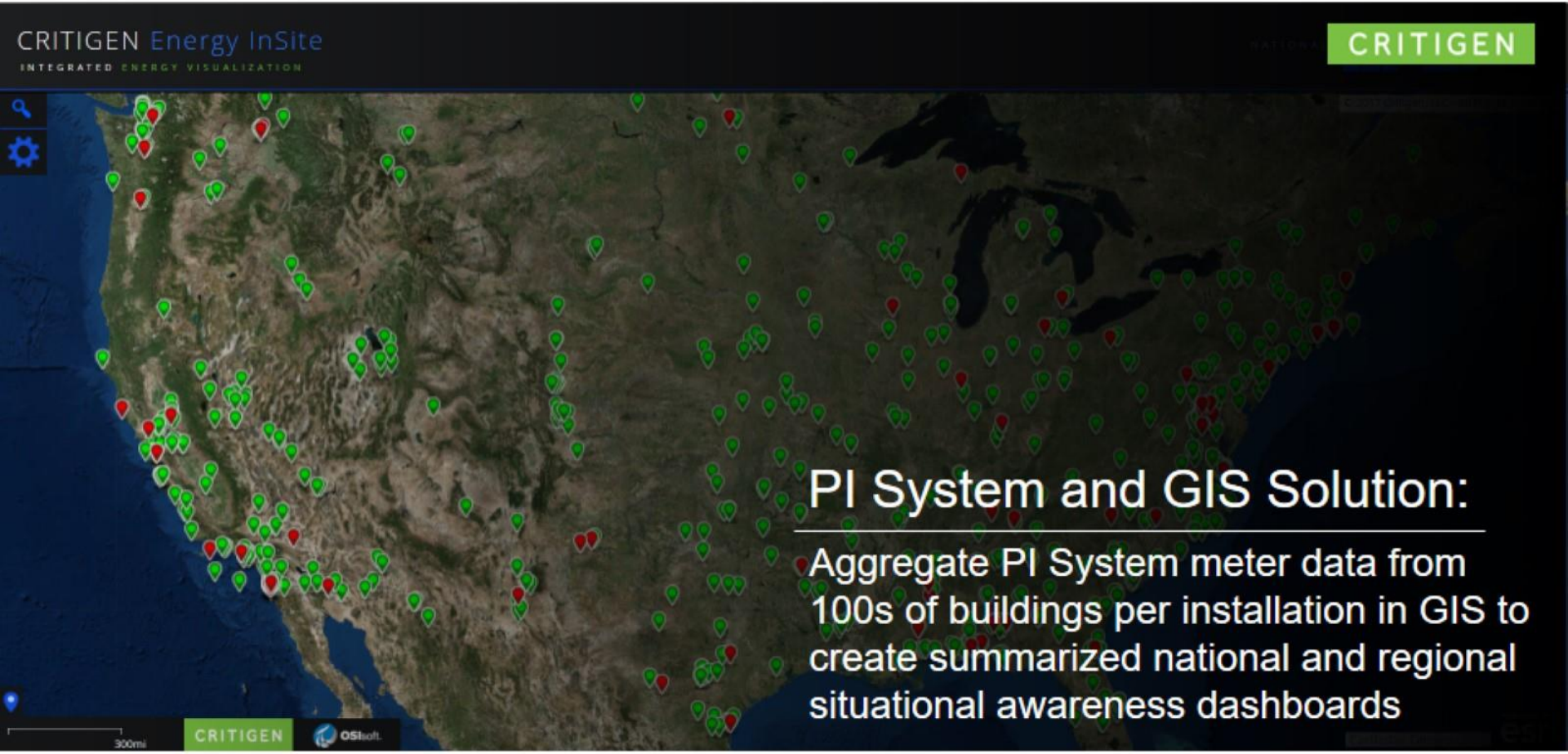


Business Challenge:

How can we monitor energy consumption at over 200 installations with hundreds of smart metered buildings each – without drowning in the data?



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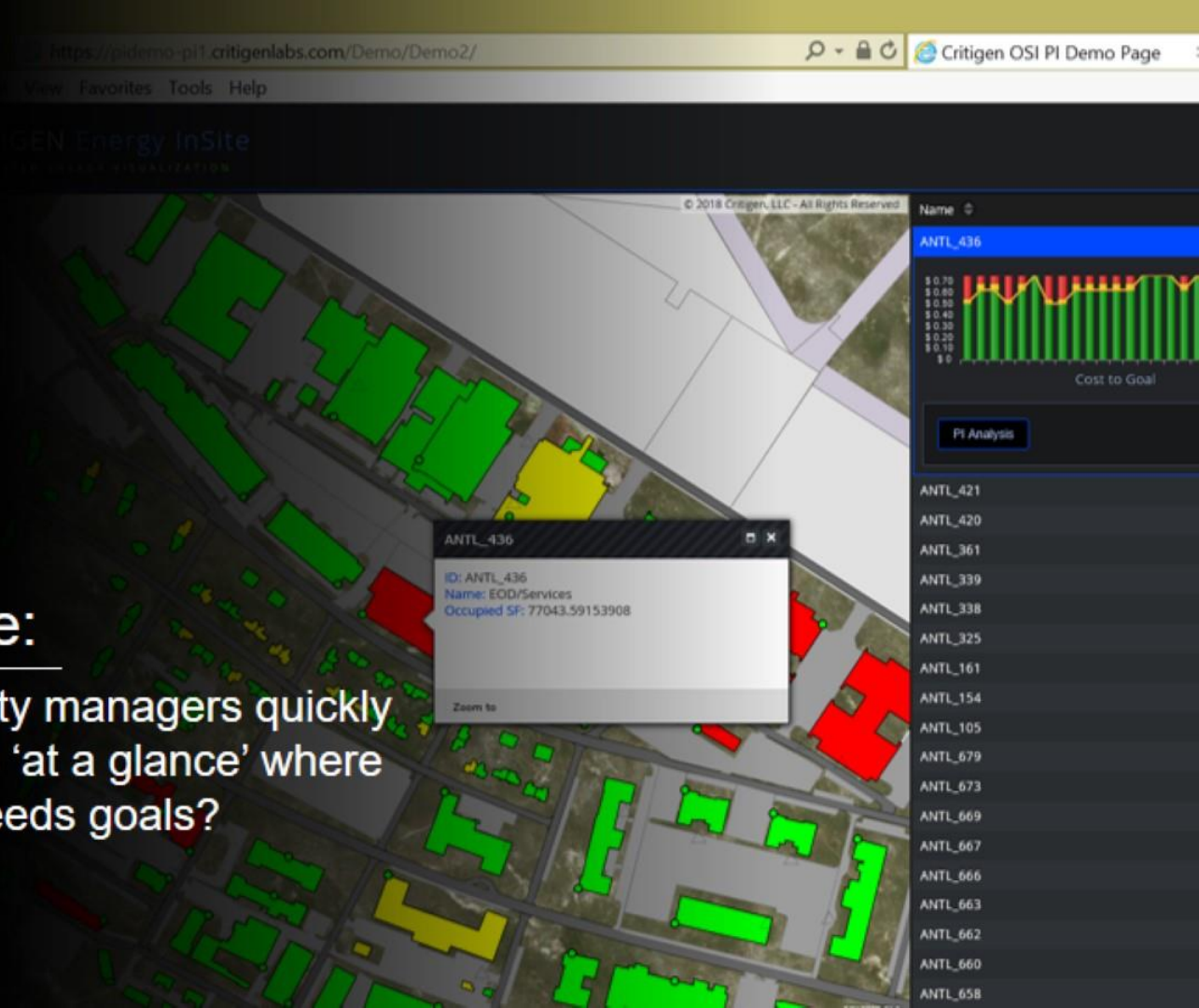
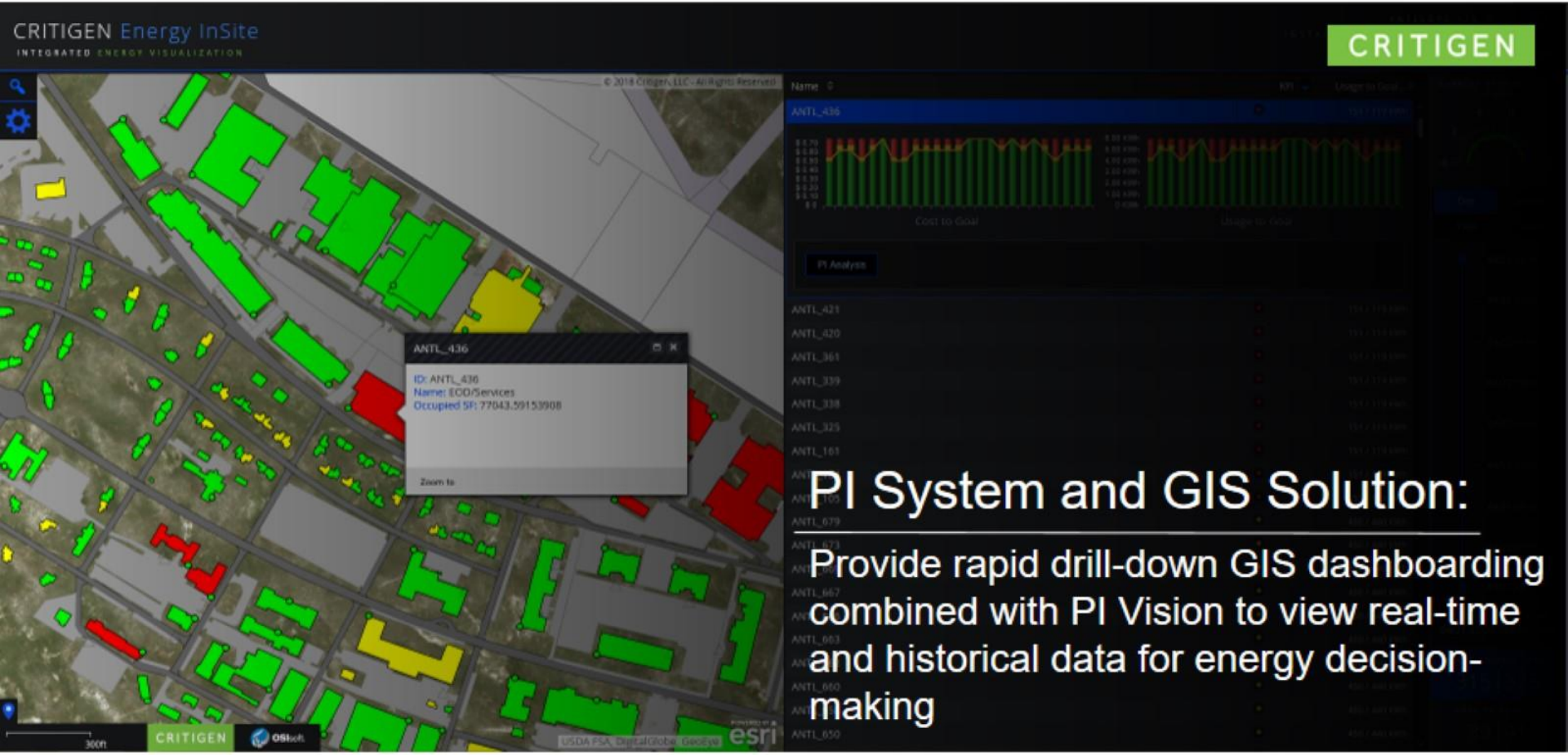


Business Challenge:

How can our energy/facility managers quickly identify problem buildings ‘at a glance’ where energy consumption exceeds goals?



PI System and GIS Solution:

Provide rapid drill-down GIS dashboarding combined with PI Vision to view real-time and historical data for energy decision-making

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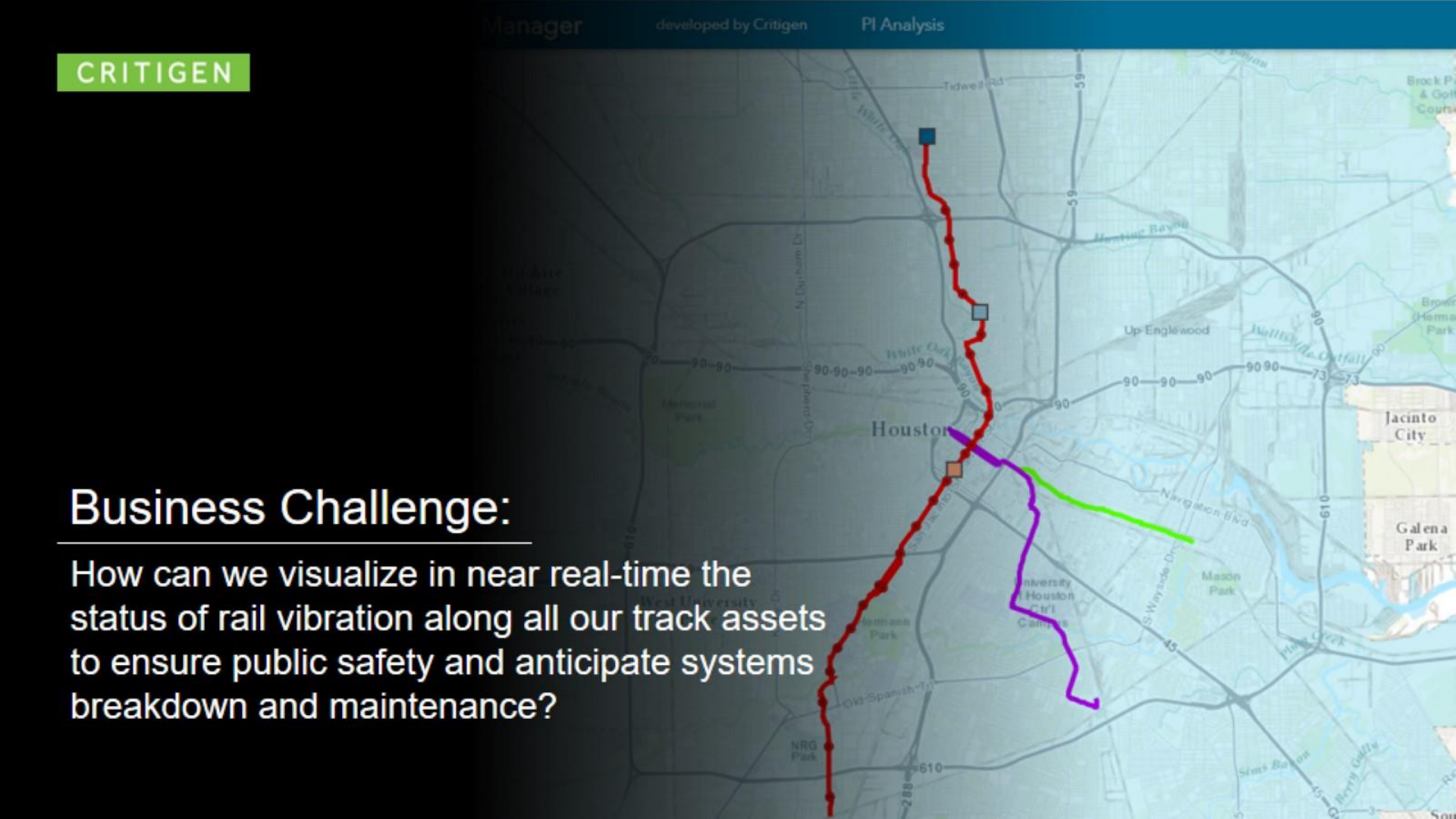
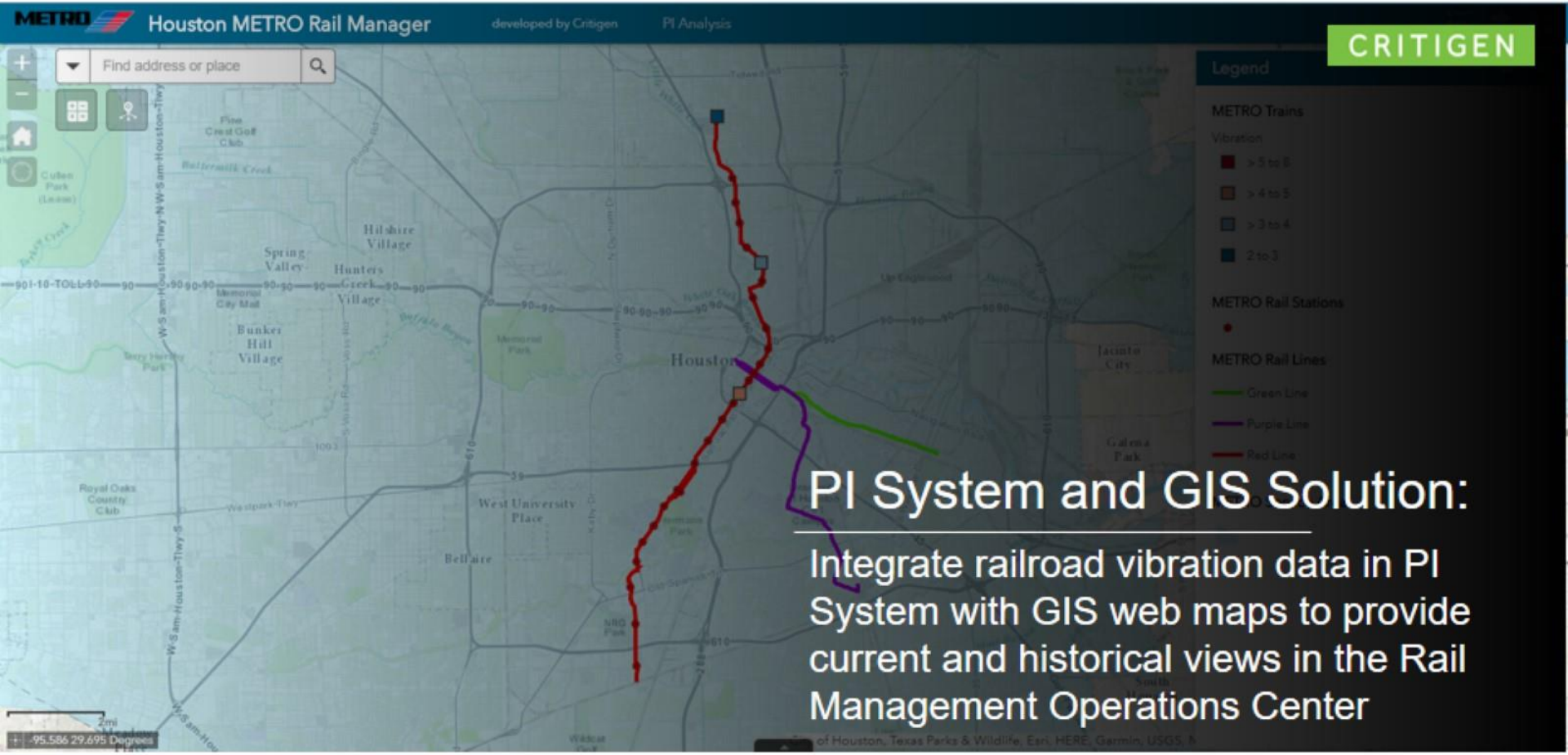


Business Challenge:

How can we visualize in near real-time the status of rail vibration along all our track assets to ensure public safety and anticipate systems breakdown and maintenance?



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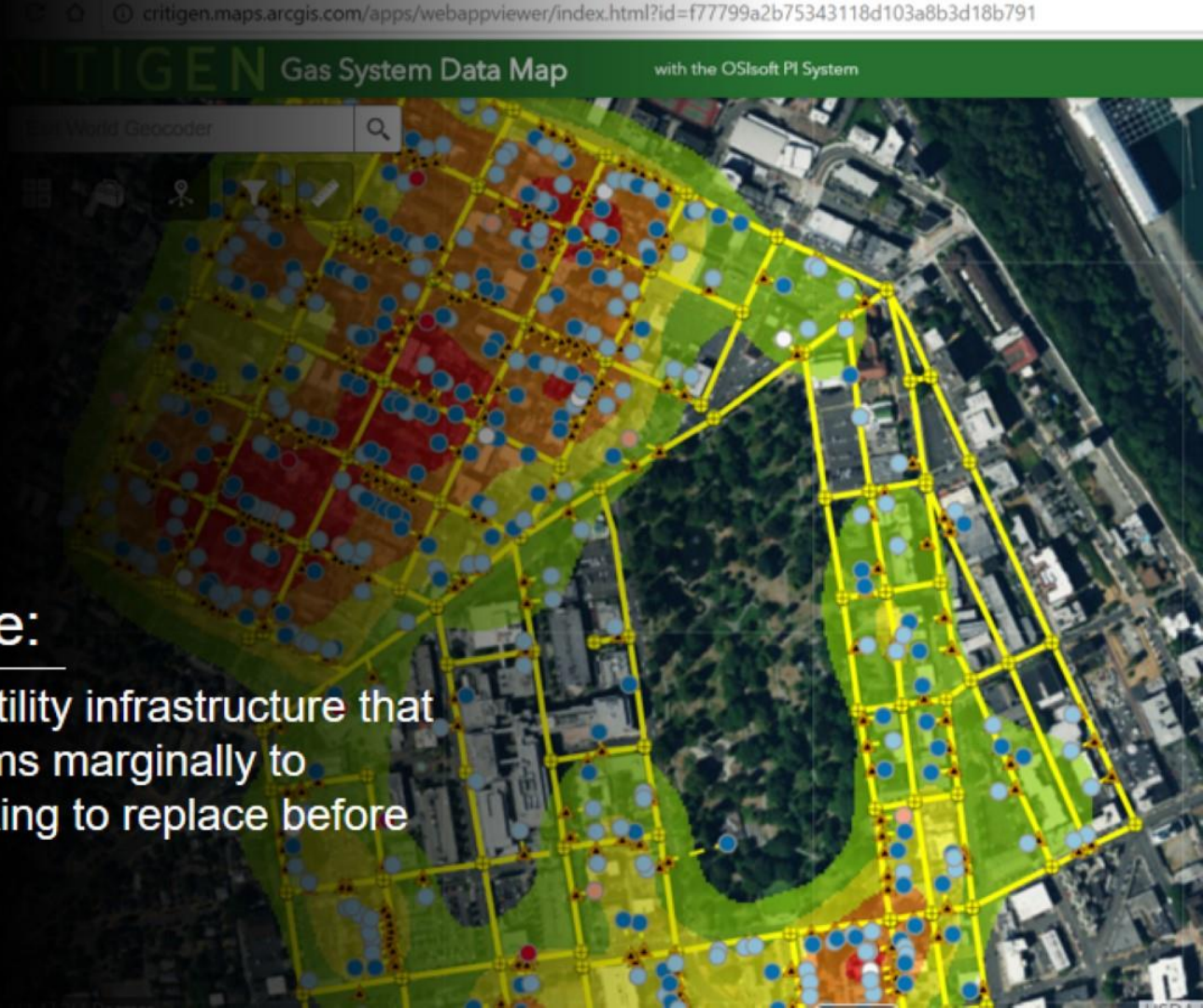
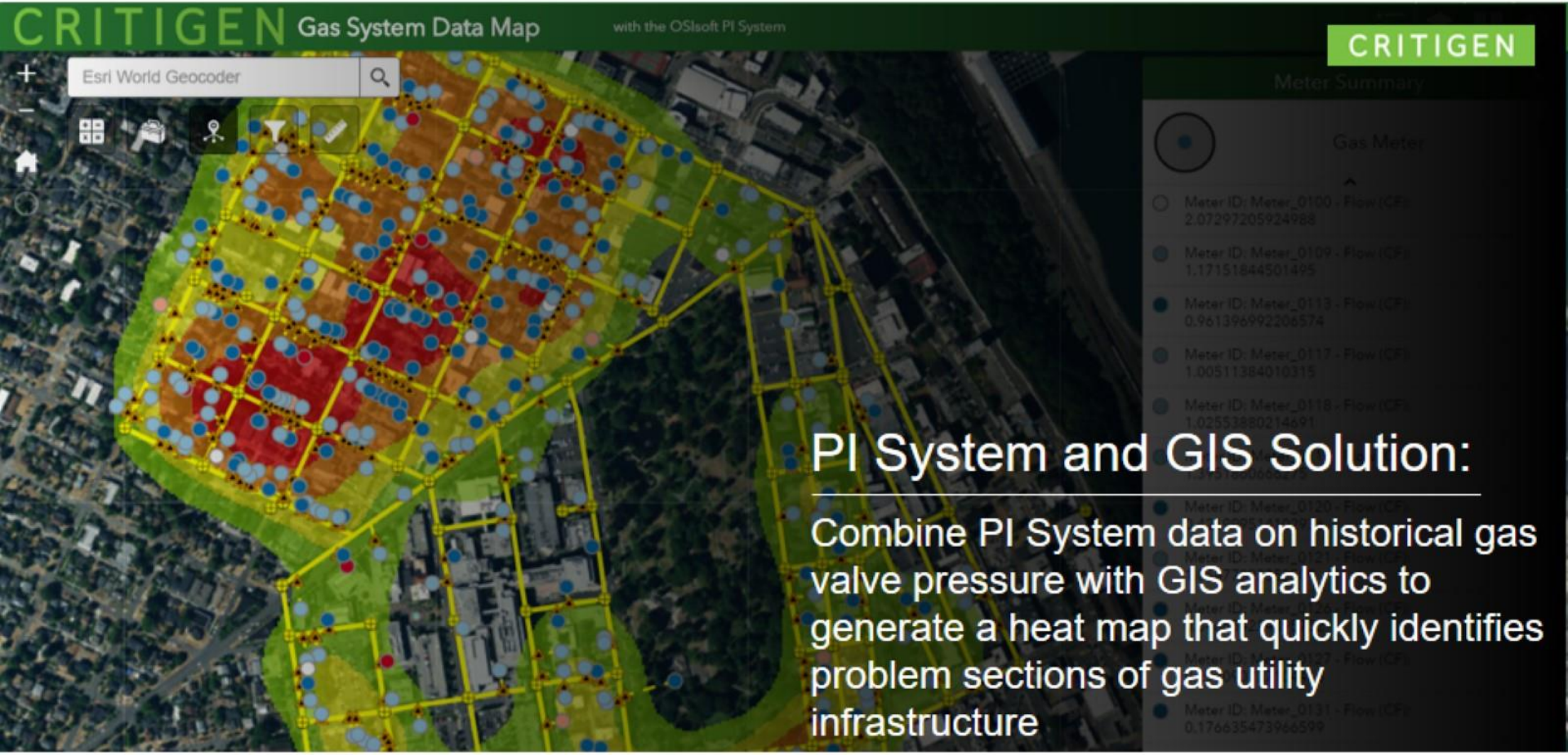


Business Challenge:

How do we identify gas utility infrastructure that historically fails or performs marginally to support our decision-making to replace before failure?



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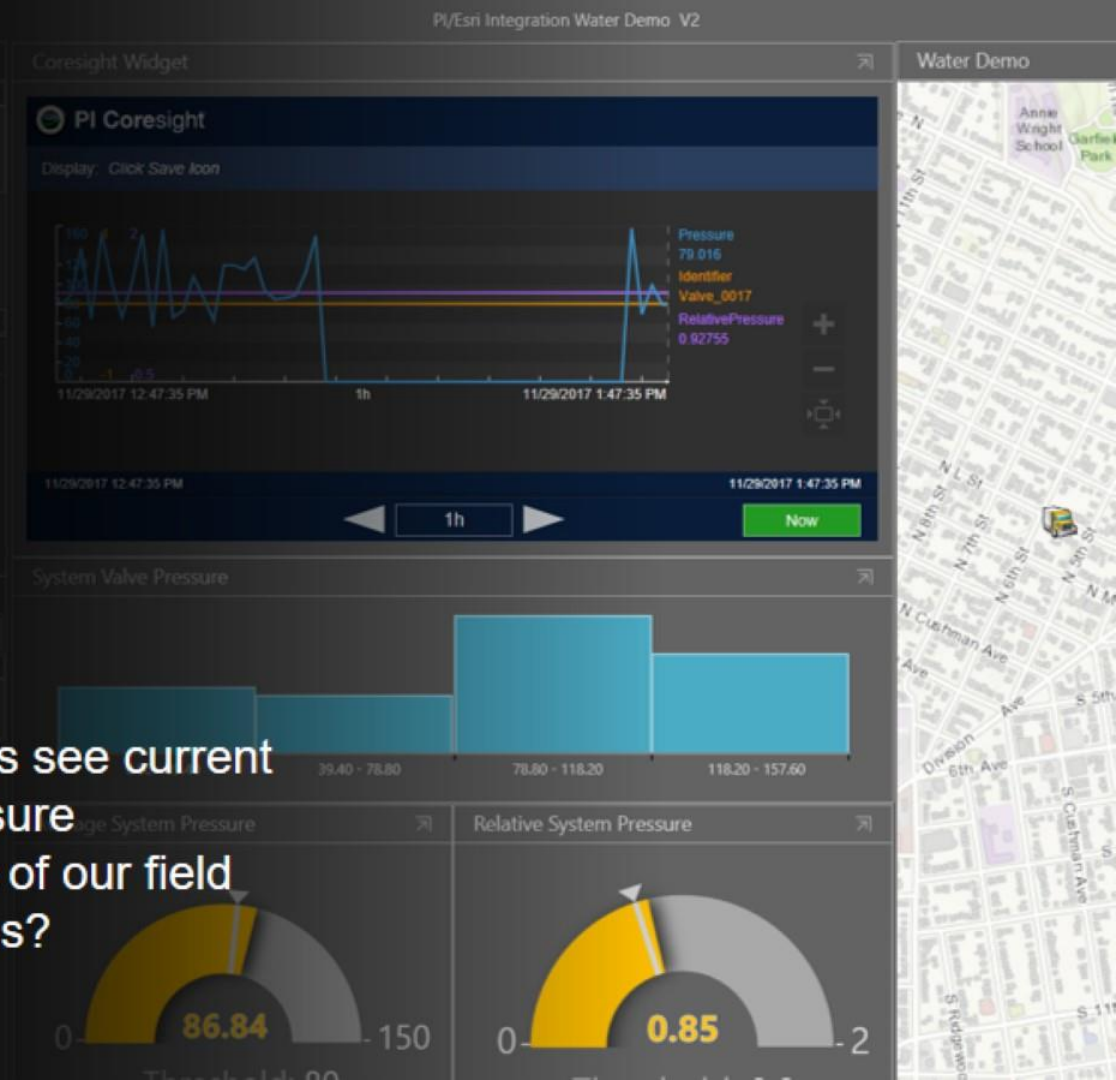
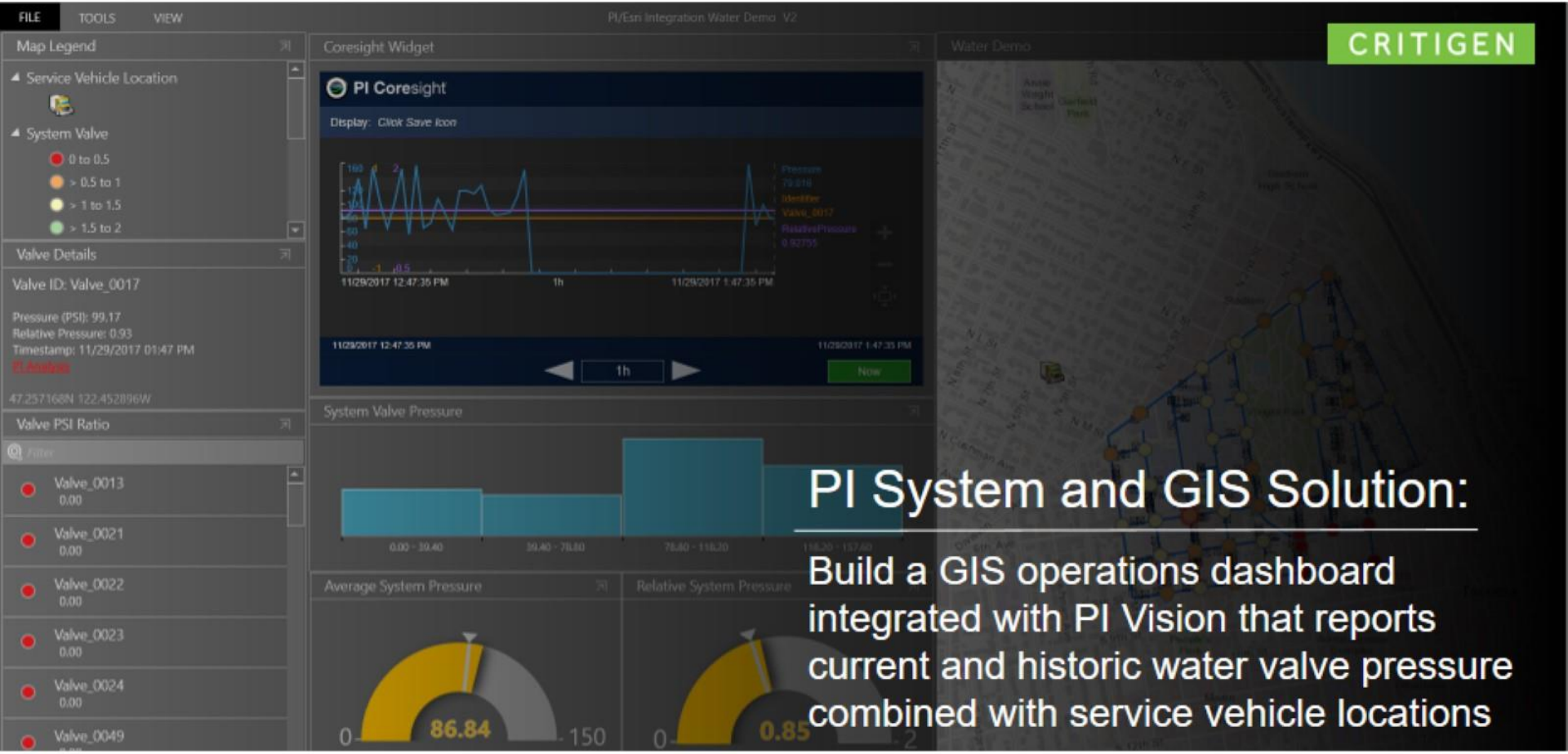


Business Challenge:

How can our operations engineers see current and historical data on water pressure combined with the location status of our field crews on repair/replace operations?



PI System and GIS Solution:

Build a GIS operations dashboard integrated with PI Vision that reports current and historic water valve pressure combined with service vehicle locations

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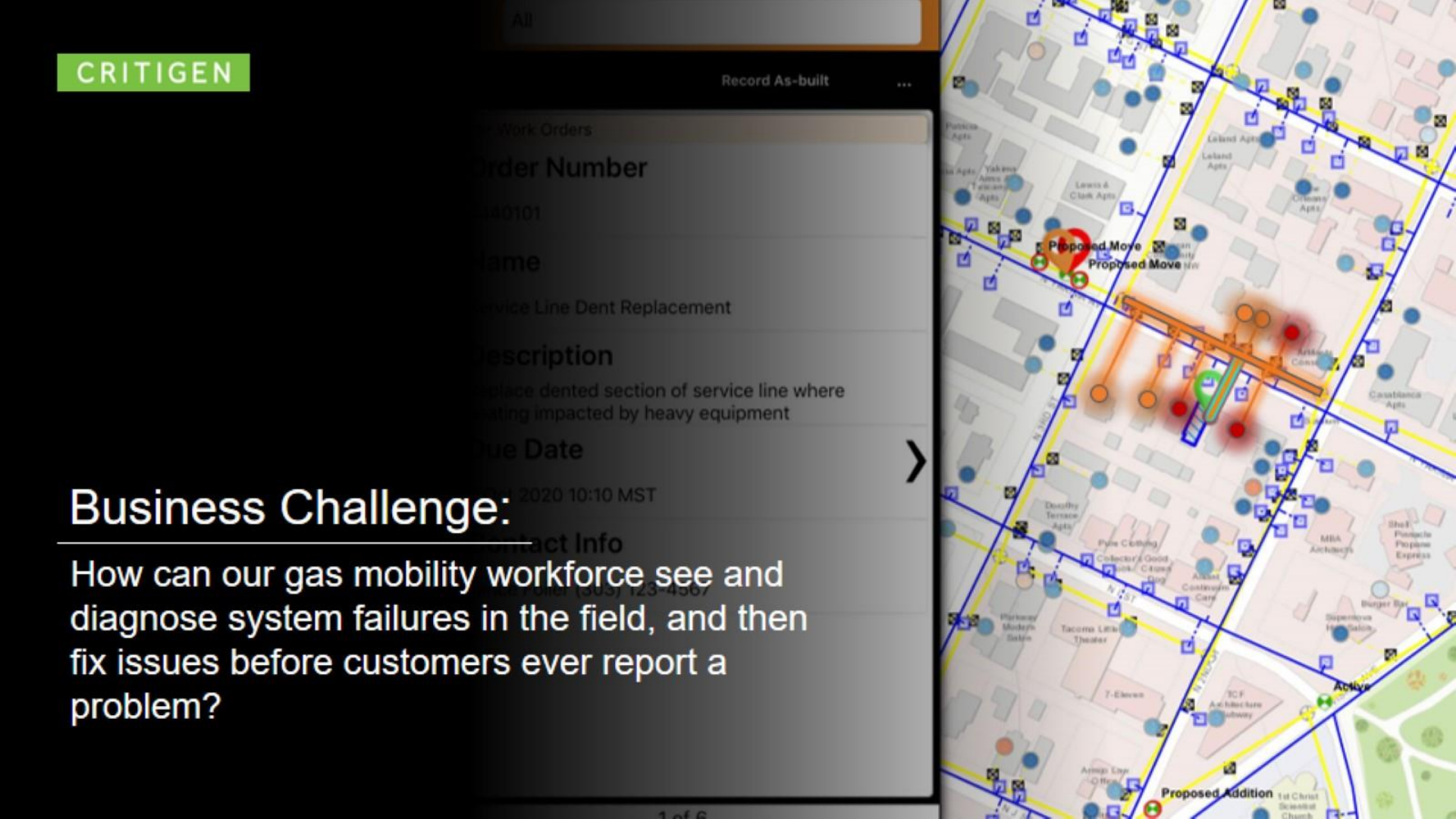
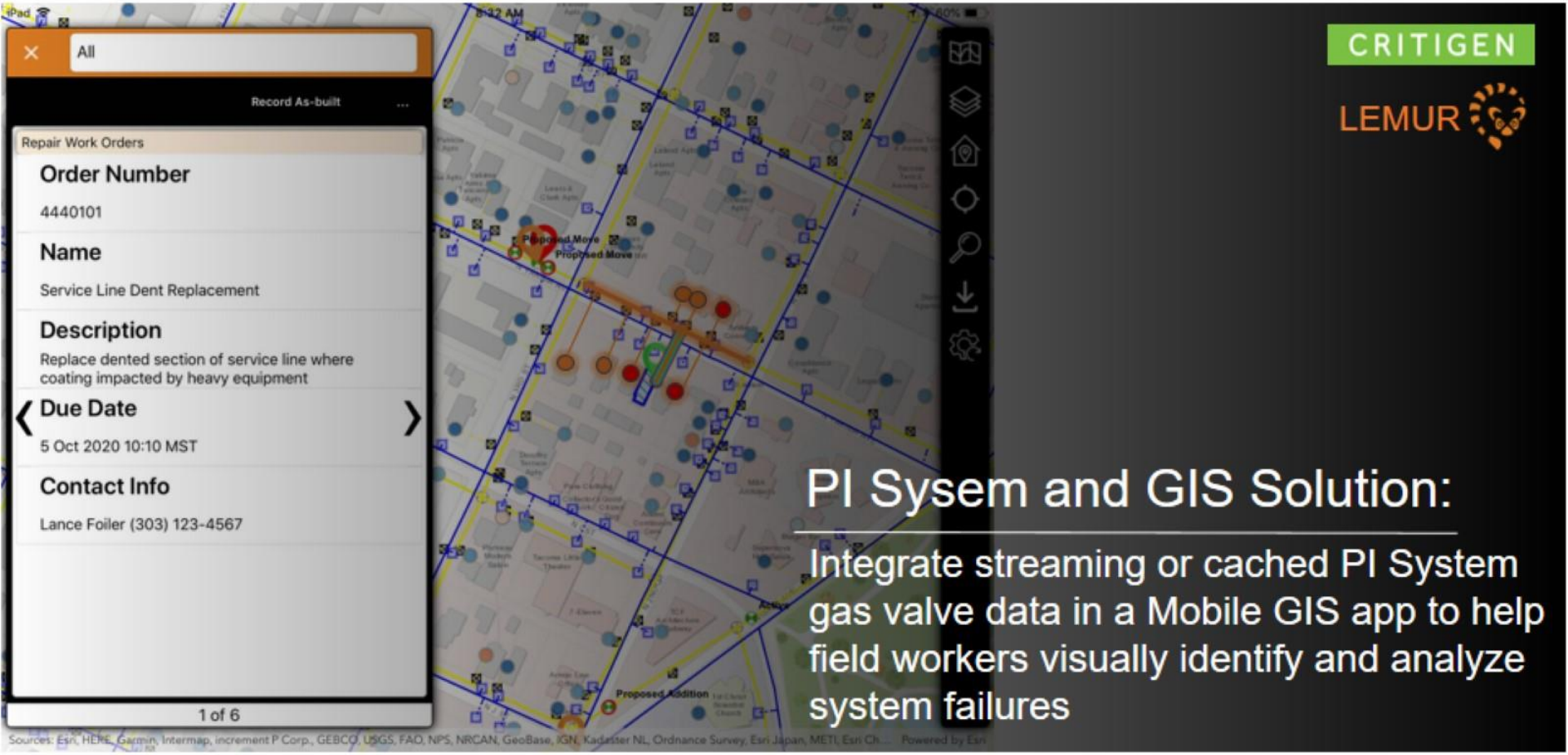


Business Challenge:

How can our gas mobility workforce see and diagnose system failures in the field, and then fix issues before customers ever report a problem?



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PI Sysem and GIS Solution:

Integrate streaming or cached PI System gas valve data in a Mobile GIS app to help field workers visually identify and analyze system failures

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Example Client Solutions

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Example Client Solutions

- Client: US military service
- Challenge: Reduce facilities energy consumption
- Region and Installation level GIS dashboards for monitoring Building, Meter and Utility data
  - Deploying in secure enclaves at 10 regions worldwide
  - Specialized users and display environments
  - Uniform solution across all deployments utilizing GIS and PI System

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Example Client Solutions

- Client: US military service
- Challenge: Support predictive-based maintenance and monitor facilities energy consumption
- Installation and Building level GIS dashboards for monitoring Building and Equipment data
  - Pilot project
  - Limited enterprise network access
  - Equipment and Building Space metrics
  - Maximo work order integration
  - Diverse set of users and use cases

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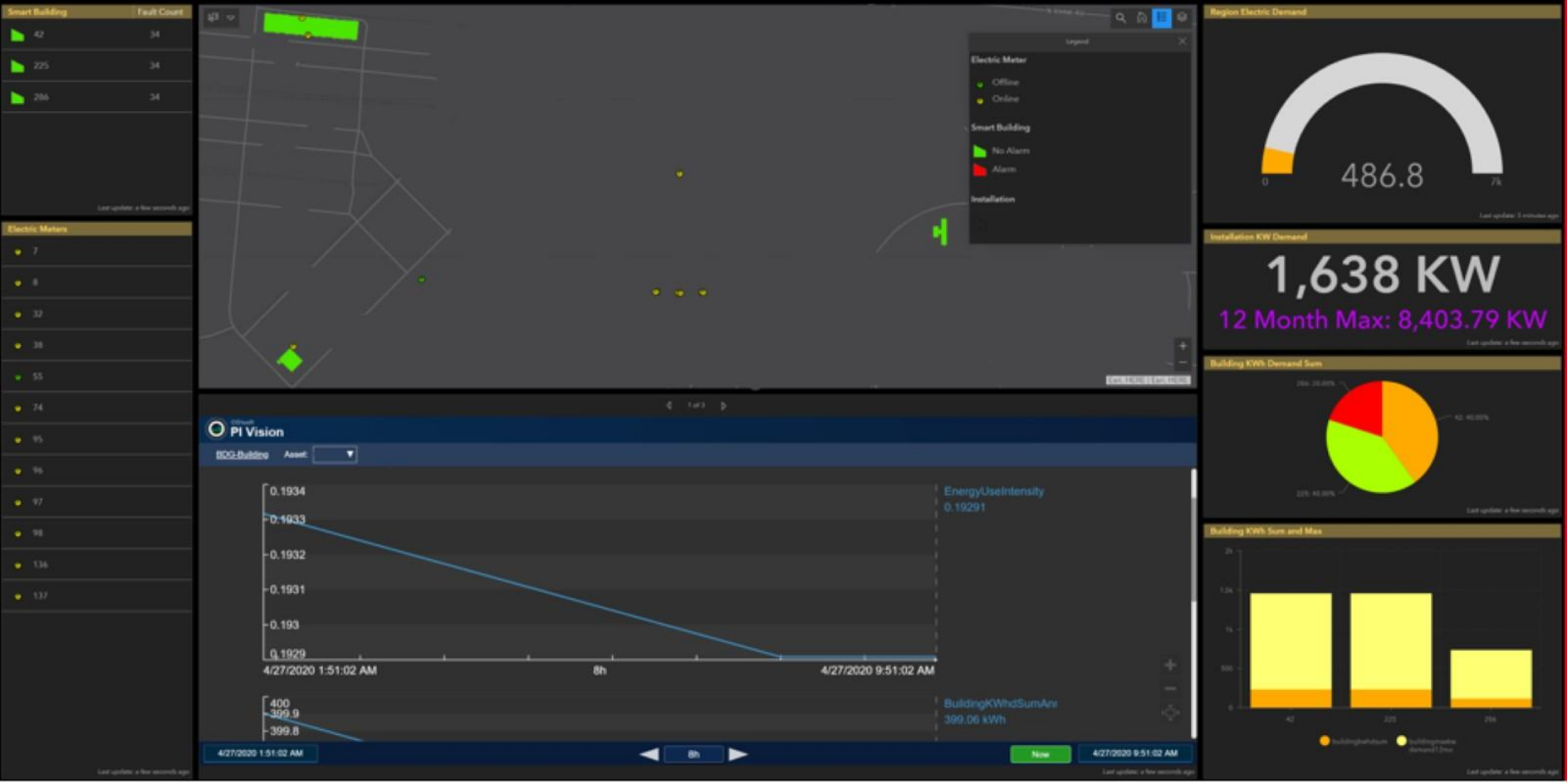

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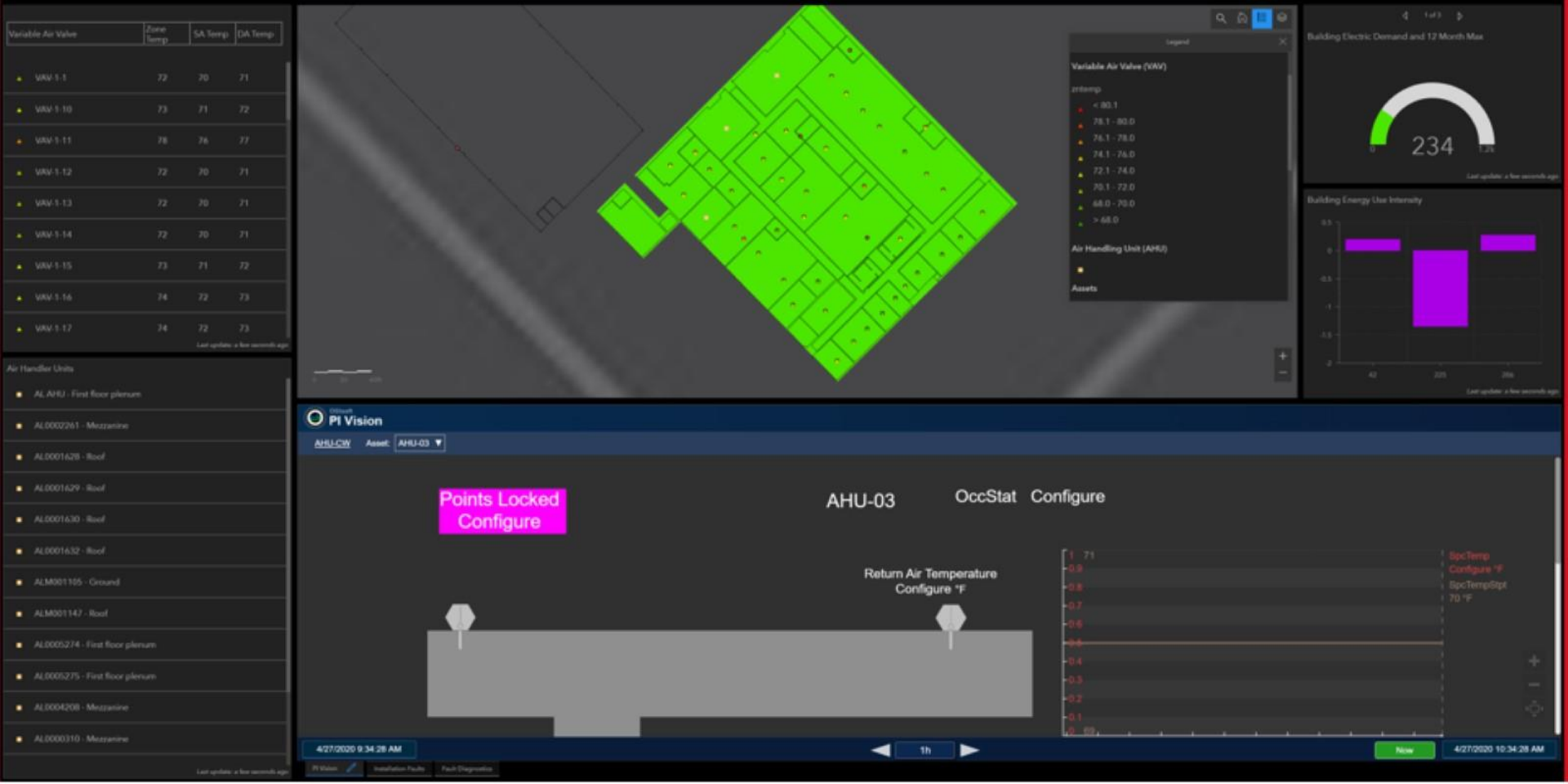

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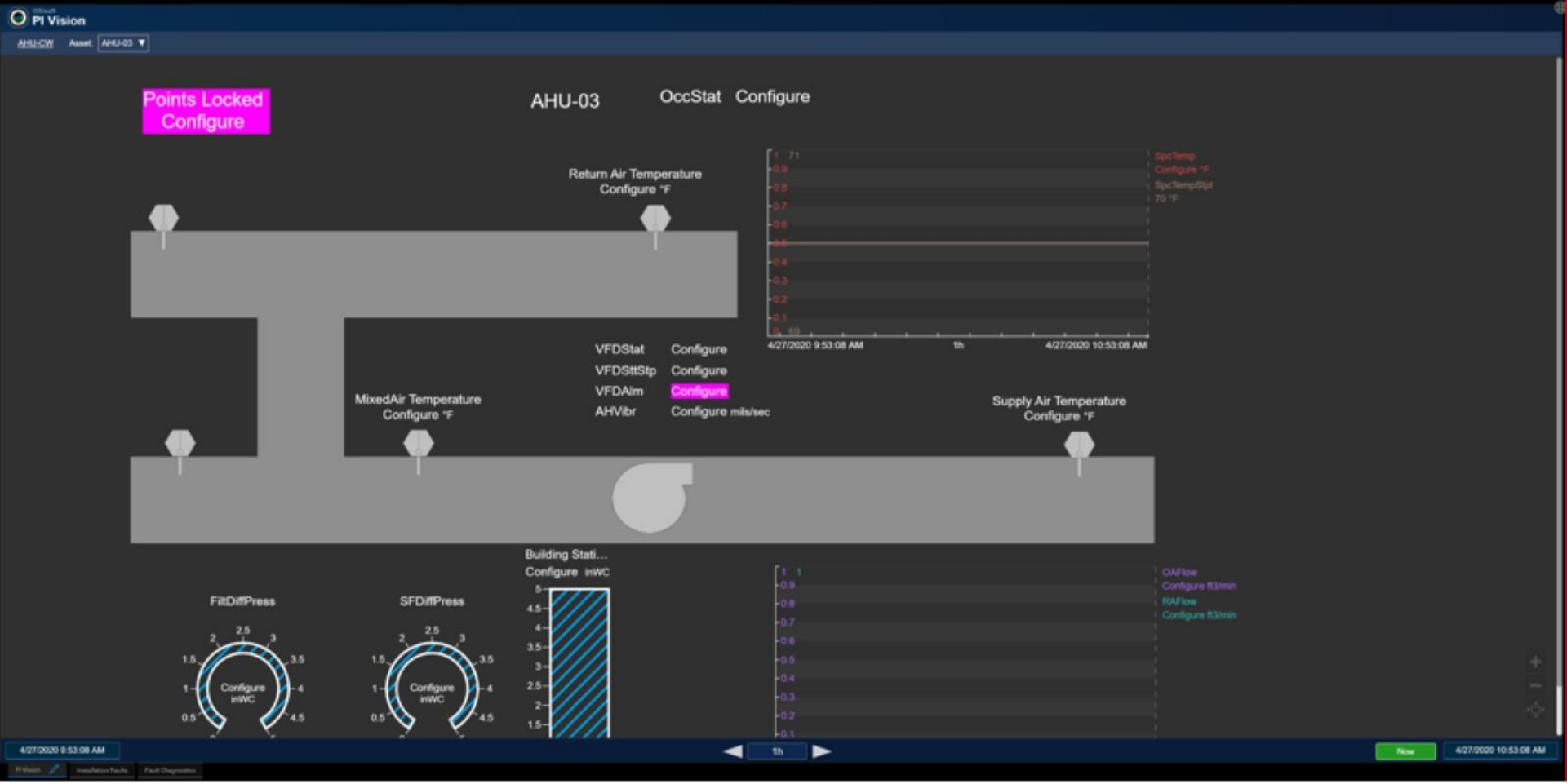

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Key Processes for Successful GIS for PI System Deployments

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Key Processes for Successful GIS for PI System Deployments

- Data acquisition and evaluation
  - Identify the available data within GIS and PI System
  - Assess data quality and reliability
  - Determine connectivity between GIS and PI System (ID's)
- Use Cases and User Stories
  - Work with owners to identify value
  - Work with users to write stories and use cases
- Display environment
  - Where will the dashboards be shown? (Ops Ctr walls, large monitors, laptops, mobile)
  - Decide on user groups (public, enterprise, managers, skilled technicians)

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Key Processes for Successful GIS for PI System Deployments

- Technical Limitations
  - Internet and internal network access
  - User rights on workstations
  - User access to GIS data and embedded applications (PI Vision, Maximo, SkySpark, others)
- Development Testing and Deployment
  - Licensing
  - Development and Test environments
  - Deployment to the Production environment

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Technology Improvements and Lessons Learned

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New Technology

- Upgraded capabilities at ArcGIS 10.7.1
  - Web-based Operations Dashboard
  - More flexible data architecture
  - More stability in GeoEvent Server and Portal
  - More support for High Availability
  - Unlimited viewer licenses (dependent on client license)
- Upgraded version of PI Integrator for Esri ArcGIS
  - Data Relay and PI Integrator on the same server

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Lessons Learned

- Architecture
  - Isolate the live data from the GIS
  - Clear the live data on a regular basis
  - Browser-based GIS dashboards are much easier to deploy
- Interface
  - Embedded PI Vision provides a much more unified experience
  - Dark themes are better for wall mount displays
  - GIS dashboard integration of a data table and the map enables quick, at-a-glance viewing
  - Value of asset location data within buildings

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Benefits of PI System and GIS Together

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Benefits of PI System and GIS Together

- We can connect real-time sensor status to time and location
- We can provide situational awareness of performance of fixed and mobile assets
- We can perform location-based analyses not possible without GIS
- We can provide access to real-time data for mobile workforces while in the field
- From a single feature location, we can dig deeper into PI System historical data

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Benefits of PI System and GIS Together

- Aggregated PI System data can be used to create multi-level GIS dashboards
- PI Vision integrated in GIS dashboards enables accelerated decision-making
- PI System and GIS provide new ways to monitor and quickly respond to assets
- It can provide location-based visibility of progress towards operational goals
- Predicting performance can be modeled using geospatial analytics like heat maps

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