

# Enabling Intelligent Infrastructure



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# Intelligent Infrastructure

Today's society is a complex system of systems; it is a combination of economic development, public safety, healthcare, energy and utilities, transportation, education, environment and various other systems.

The function of intelligent infrastructure is to model as well as manage these complex interconnected systems based on a greater understanding of the interconnectivity and utilization of the latest developments in ICT.

Intelligent infrastructure involves the combination of

- Sensors
- Network connectivity
- Software to monitor and analyze the inputs for more efficient operations.
- Geospatial technology



# Intelligent Infrastructure Enablers

Multiple technology enablers are driving the current push for making Infrastructure intelligent. And since the price of these technologies has been constantly falling, it has revolutionized the way we think of Infrastructure.

- CLOUD – bringing down cost of ownership of GIS
- Inexpensive Wireless Sensors and Networks, Nanoscale Sensors
- Big Data Analytics and the ability to analyze 24X7 continuous data
- Widespread adoption of GPS
- Powerful Tablet PC's at affordable prices
- Advances in Geospatial technology and ability to combine inputs from the above and increasing use of GIS as a visualization platform which integrates data from above.



# Intelligent Infrastructure Applications

- **Intelligent Energy and Water Management Systems**
- **Emergency response and disaster management**
- **Intelligent Transportation Systems**
- **Precision Agriculture**
- **Intelligent Manufacturing,**
- **Intelligent Healthcare Systems**
- **Intelligent Building Automation Systems**
- **...Many more**



# Nobel Enables Intelligent Infrastructure

## Primary Focus : Water and Waste Water Management

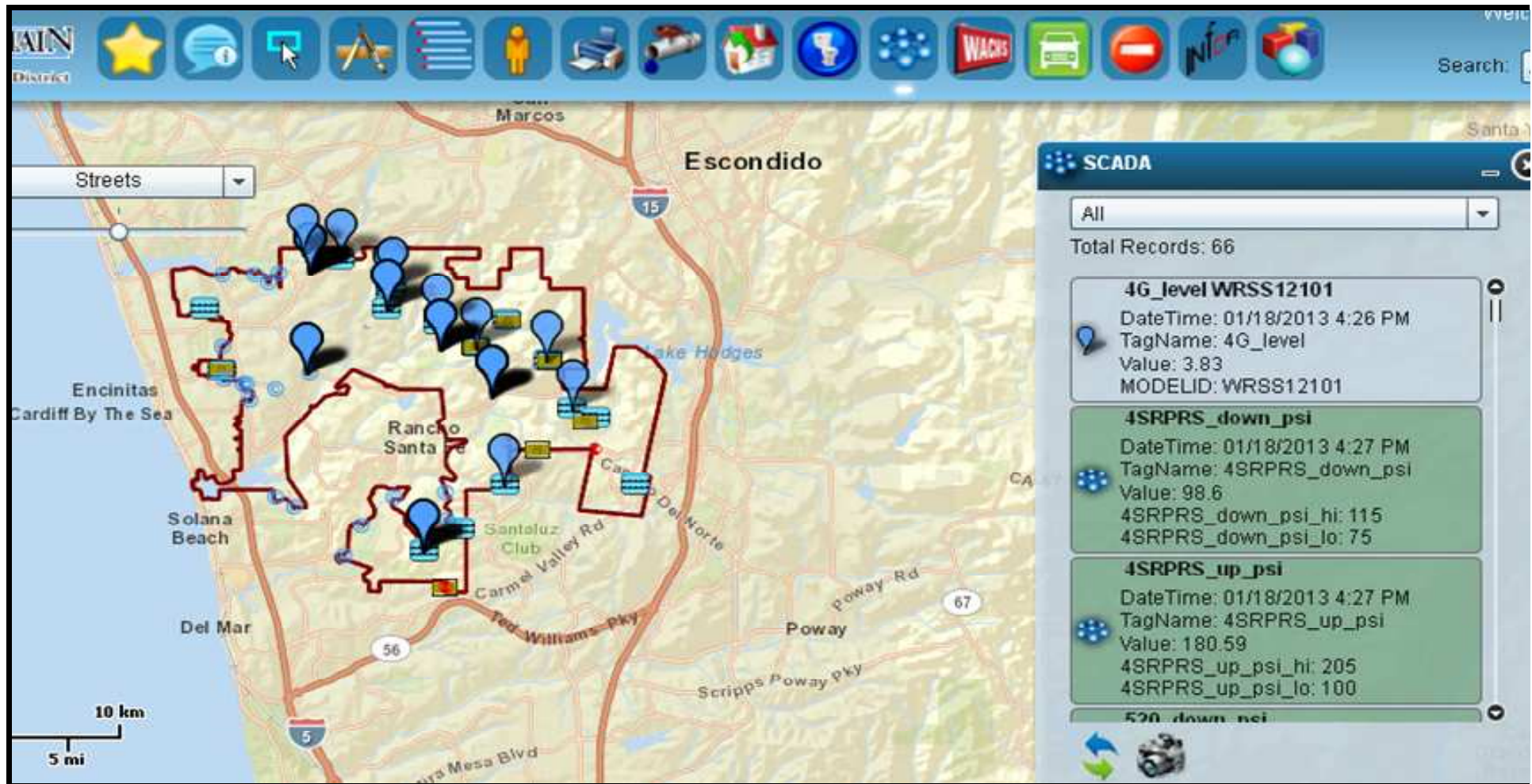
- Cloud based GIS solution – We get municipalities quickly up and running with feature rich high end utility GIS at a very low total cost of ownership.
- Geo-Viewer, a proprietary web based tool, allows instant access to GIS information from anywhere in the world, in real time. It integrates in Real time to other systems such as
  - **Supervisory controls SCADA**
  - **Hydraulic modeling**
  - **Vehicle tracking,**
  - **Asset management, Billing etc.**
- Mobile iPad solution revolutionizes field work by pushing GIS Maps onto Tablets and enabling people to work with maps even when there is no connectivity
- Combined SaaS/Mobile Solution provides operational intelligence allowing the water company to solve major problems in real time



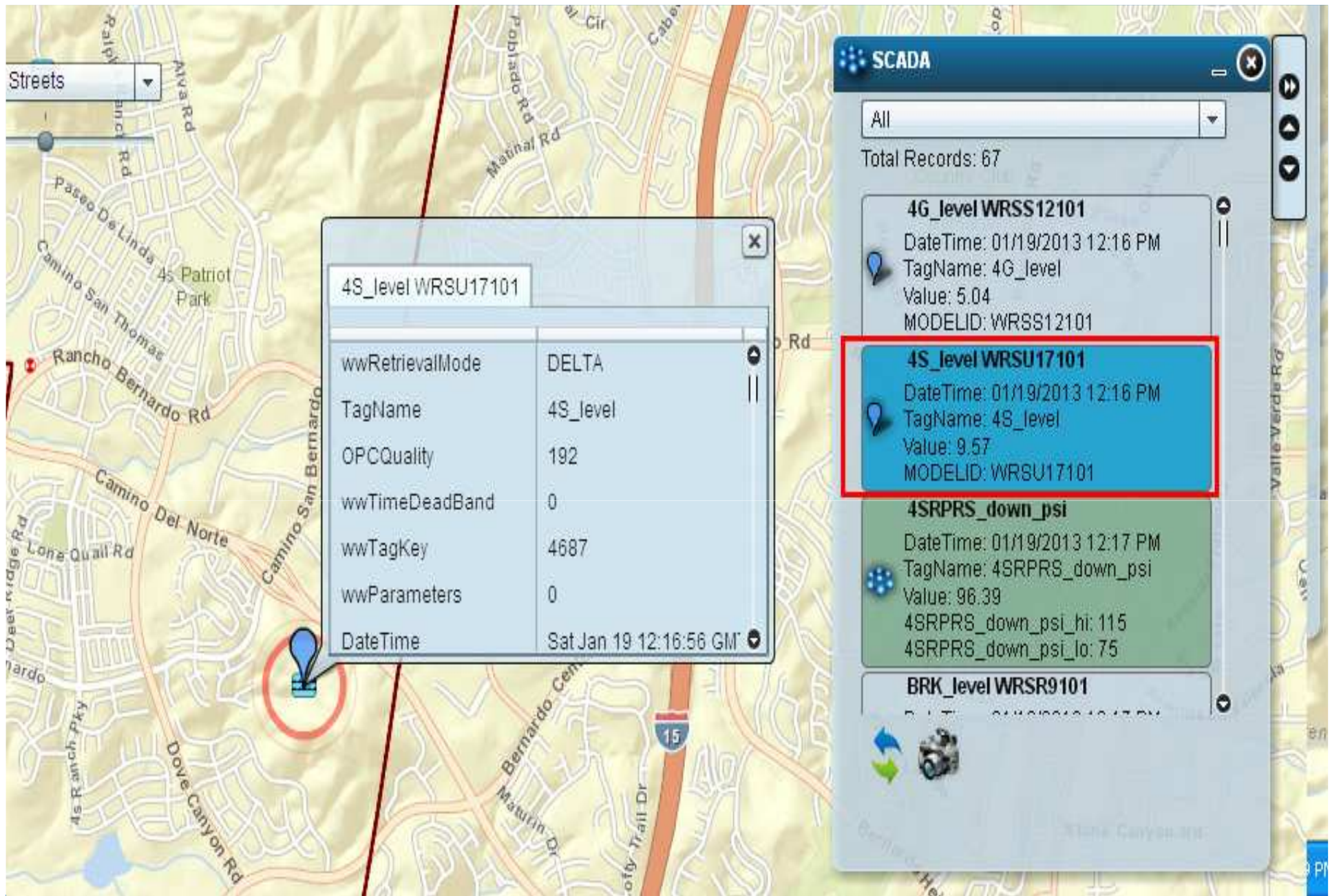


# SCADA

The term SCADA(**supervisory control and data acquisition**) usually refers to centralized systems which monitor and control entire sites, or complexes of systems spread out over large areas







### SCADA



4S\_level Past 48 Hours Trend Data

Show Chart Download Chart

Total Records: 46

- 4G\_level
- 4S\_level
- 4SRPRS\_down\_psi
- 4SRPRS\_up\_psi
- 520\_down\_psi
- 520\_up\_psi
- BRK\_level
- CAMB\_DOWN\_PSI

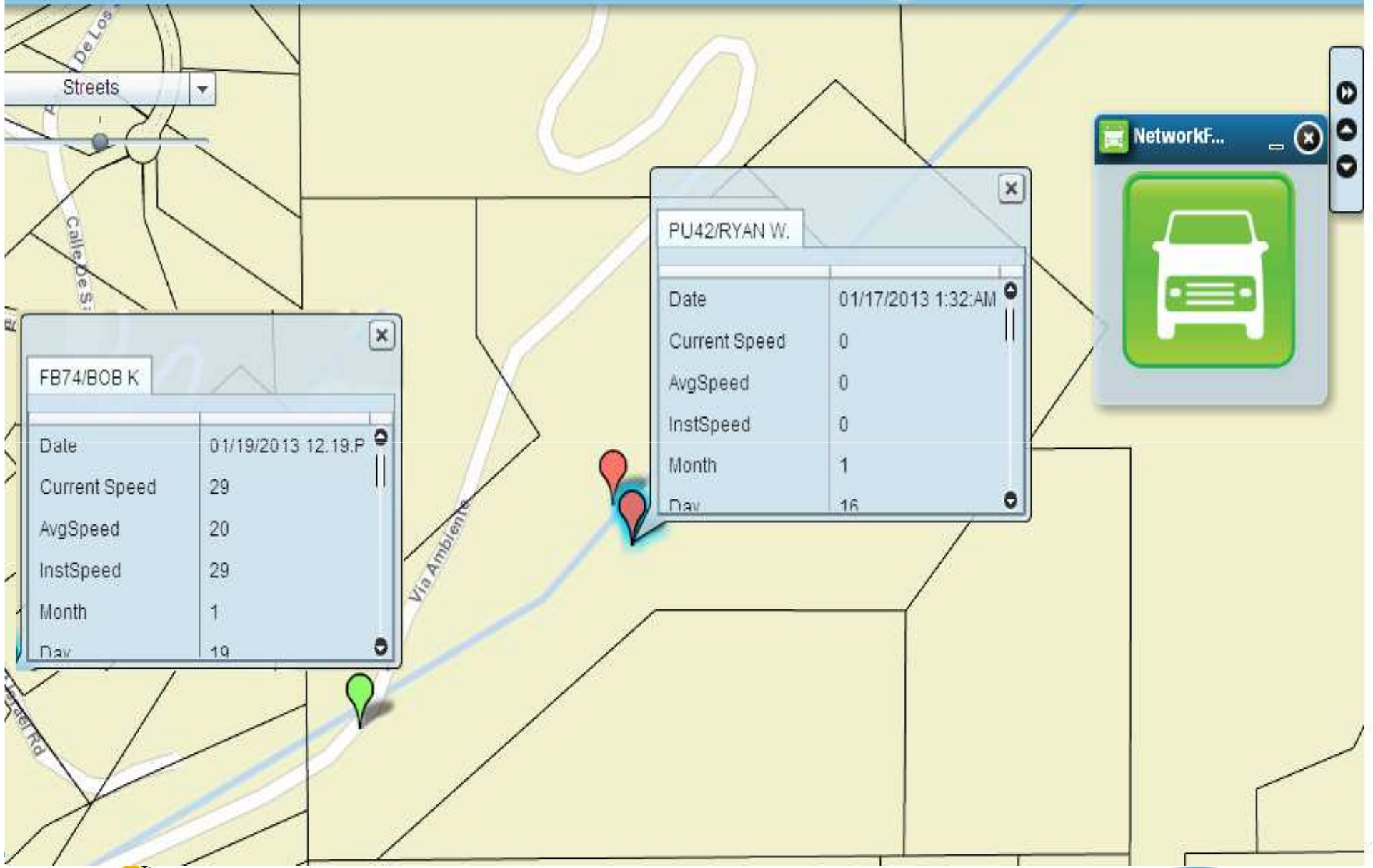






Search





FB74/BOB K

Date	01/19/2013 12:19:P
Current Speed	29
AvgSpeed	20
InstSpeed	29
Month	1
Day	19

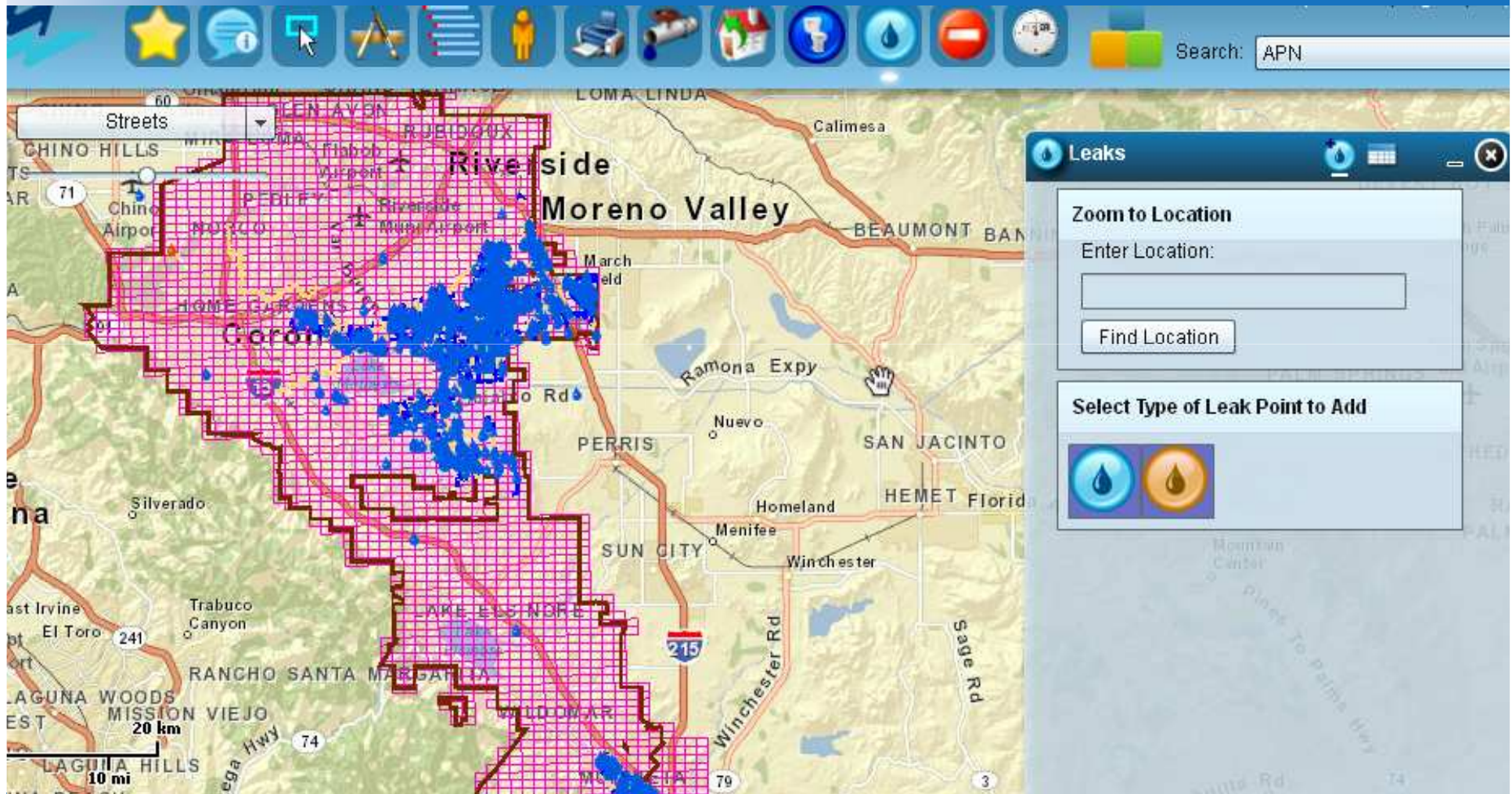
PU42/Ryan W.

Date	01/17/2013 1:32:AM
Current Speed	0
AvgSpeed	0
InstSpeed	0
Month	1
Day	16





**LEAKS** : By selecting the tool **Leaks**, water pipes which have leaks are displayed in blue color on the map





# LEAK DETAILS

Streets

**LK0473**

LK0473

Lat	33.92067
Long	-117.32569
Address	
Pipe Size	6
Pipe Type	STEEL

View

**Leaks**

Select: Leak Water Points

Field: No of Days Leaki...

Value: 12

Search

**LK0473**

No of Days Leaking: 12  
Work Order Number: 221-54-200-LK0473  
Leak Number: LK0473  
Repair Date: 04/06/2004 5:30:AM  
Pipe Type: STEEL

100 m



# LEAK DETAILS

Welcome, archana | Log out

Search: APN

Daily Labor/Equipment Details | Repair Record Details | Attach Images

Leak Point Number: LK0938    OES Number:

Leak Point Description | Leak Point Repair Information

Repair Date: 01/19/2009 5:30 AM

Water Shut Off Time: 01/18/2013 2:42 PM

Water Turn On Time: 01/18/2013 2:42 PM

USA Notification     USA Ticket No.

Anodes Installed     Soil Sample Taken

Captured     Test Station Installed

Test Wires Installed     Status

Action Taken: Crew excavated for leak and found a 6" Cast Iron spool buried inside an abandoned vault. Crew found a 4" lateral split in the Cast Iron Pipe. They installed a 6" Stainless Steel repair band for a temporary repair. Staff has to figure out how to isolate that portion of pipeline.

Leaks

Select: Leak Water Points

Field: No of Days Leaki...

Value: 12

Search

**LK0938**

No of Days Leaking: 28  
Work Order Number: 225-54-050-LK0938  
Leak Number: LK0938  
Repair Date: 01/19/2009 5:30:AM  
Pipe Type: CAST IRON



# Sewer Tracing – Upstream Trace

The screenshot displays a GIS application interface for sewer tracing. At the top, a blue header contains the title "Sewer Tracing – Upstream Trace". Below the header is a toolbar with various icons for navigation and analysis. A search bar on the right shows "Search: APN". The main map area shows a network of sewer pipes with a red box highlighting a specific section. A "Sewer Tracing" dialog box is open, prompting the user to "Select a Pipe to start Trace." with three options: an upward arrow, a downward arrow, and a pipe icon. The map also features a "Streets" dropdown menu and a zoom slider.





# Sewer Tracing – Upstream Trace

Streets

**Sewer Tracing**

Select a Pipe to start Trace.

↑ ↓

**CleanOuts**

MODELID: SCOR9101  
ASBUILT\_NO: 620943.23  
Status: I  
Owner: OMWD

**CleanOuts**

MODELID: SCOR9102  
ASBUILT\_NO: 620943.23  
Status: I  
Owner: OMWD

**CleanOuts**

MODELID: SCOQ9101  
ASBUILT\_NO: None  
Status: I



# Sewer Tracing – Downstream Trace

The screenshot shows a GIS application interface for sewer tracing. At the top left, the logo for 'OLIVENHAIN Municipal Water District' is visible. A toolbar contains various icons for navigation and analysis. The main map area shows a network of pipes and fittings, with a 'Streets' layer selected. A 'Zoom In' button is located on the left side of the map. On the right, a 'Sewer Tracing' panel is open, displaying the following information:

**Sewer Tracing**  
Select a Pipe to start Trace.

↑ ↓ ↻

**Fittings**  
MODELID: SFIQ9142  
ASBUILT\_NO: None  
Status: I  
Owner: OMWD

**Fittings**  
MODELID: SFIQ9143  
ASBUILT\_NO: None  
Status: I  
Owner: OMWD

**Fittings**  
MODELID: SFIQ9155  
ASBUILT\_NO: None  
Status: I





# Valve Isolation tool

The screenshot displays a GIS application interface for a 'Valve Isolation' tool. At the top, a blue header contains the title 'Valve Isolation tool'. Below the header is a toolbar with various icons for navigation and analysis. The main map area shows a network of pipes and valves. A red box highlights a specific pipe labeled '10" PVC -14289'. A 'Valve Isolation' dialog box is open on the right, with the text 'Select a Pipe to simulate a Pipeline Break and start analysis.' and three icons for selection. The map also shows other pipes like '8" PVC -14257' and '12" PVC -14288', and a 'Streets' dropdown menu. The location is identified as '4S RANCH'.





# Valve Isolation tool makes it easy to identify the valves controlling a section of pipeline



# Valve Isolation tool – Impacted properties are highlighted and can be automatically notified

The screenshot displays a GIS application interface for pipeline management. A map shows a network of pipes and valves. One valve is highlighted with a red circle. A context menu is open over this valve, with the 'Mark Inoperable' option highlighted in red. A 'Valve Isolation' dialog box is also open, displaying instructions and a list of impacted valves.

Property	Value
OBJECTID	9782
ANCILLARYROLE	0
Enabled	1
Facility ID	U16101
Model ID	WSV16101
Grid Number	U16101
Subtype	1

**Valve Isolation**

Select a Pipe to simulate a Pipeline Break and start analysis.

Run Analysis Again

**Valves**

- Facility ID: U16162  
Subtype: 1  
Status: I  
Diameter: 10
- Facility ID: U16101  
Subtype: 1  
Status: I  
Diameter: 10

**Parcels**



# HYDRAULIC MODELING

The screenshot displays a hydraulic modeling software interface. At the top, a blue banner contains the title "HYDRAULIC MODELING". Below this, a map shows a street network with a blue circle indicating a meter location. The map includes a "Streets" dropdown menu and a scale bar for 200 meters. Several areas of the map are labeled "Map data not yet available".

Overlaid on the map is a "Meter" data table with the following structure:

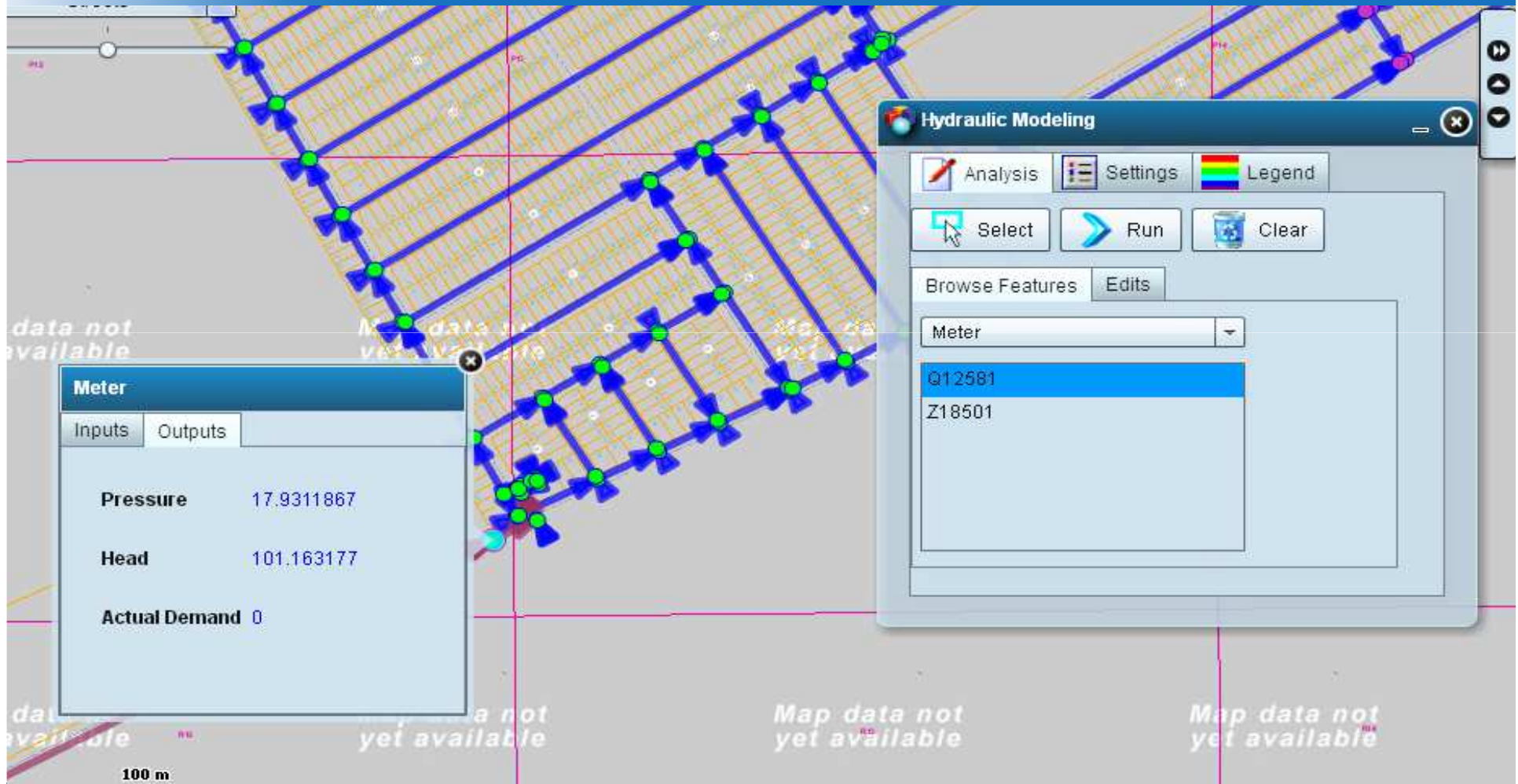
Meter	
Inputs	Outputs
Pressure	
Head	
Actual Demand	

To the right of the map is a "Hydraulic Modeling" control panel. It features a toolbar with "Analysis", "Settings", and "Legend" buttons. Below the toolbar are "Select", "Run", and "Clear" buttons. The panel also has "Browse Features" and "Edits" tabs. Under "Browse Features", a dropdown menu is set to "Meter", and a list shows two items: "Q12581" (highlighted in blue) and "Z18501".





# HYDRAULIC MODELING

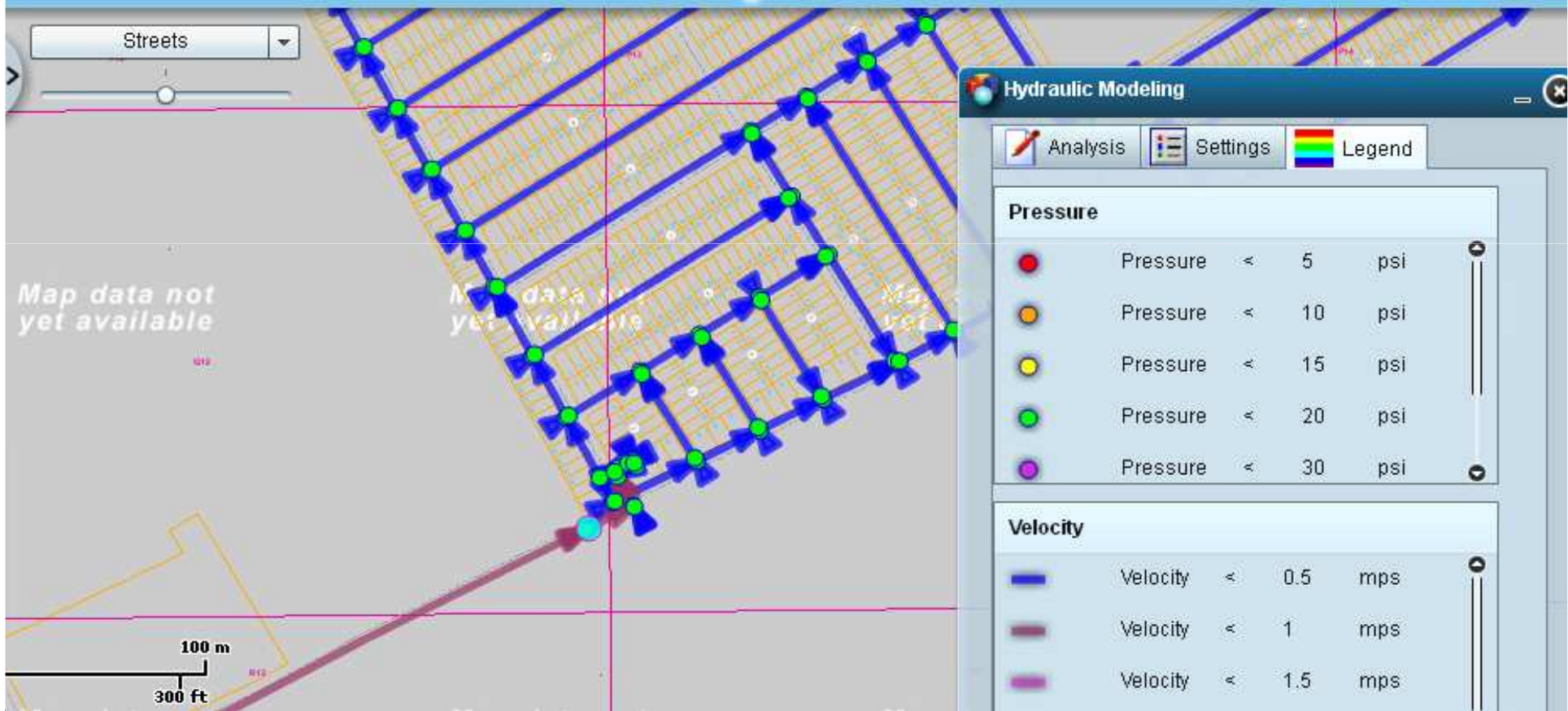


# HYDRAULIC MODELING

Welcome, archana | Logout | Help |



Search: Account Number







# GeoViewer Mobile



## Designed exclusively for iPad

*Put your GIS data to work for you in ways you never imagined*

in the field | on the front lines | when and where you need it | online or offline

Municipalities, water, and other utility districts can now harness the power of GIS mapping and the intuitive user experience of the iPad for instant access to critical business data, all at the touch of a fingertip

### Connected:

*Access GIS data anywhere*

Mobile access to comprehensive distribution network renderings, field documents, work order history, and more, with or without internet access, along with the tools to link field crews and office staff to GIS data in a seamless experience

### Integrated:

*Streamline workflow, reports and communication*

Built-in, process-driven design puts GIS data in the hands of the field crews and managers who need it to save time, improve communication and aid decision making

### Customized:

*Create a solution for your specific needs*

GeoViewer Mobile is fully scalable for agencies of all sizes, with customized modules to match the wide-ranging and complex needs of municipalities and utilities



### Powerful: *Enhance the capability and connectivity of your GIS team*

Designed with the end user in mind, GeoViewer functionality supports

- Inspections
- Pipeline network tracing
- Work orders
- Parcel identification and notes
- Valve isolation analysis
- Dig alerts



# GeoViewer Mobile



## Customizable Solutions, Unlimited Possibilities

*Get more out of your GIS data every day, in the office and the field*



### Asset Info

Provides for quick identification of asset locations, and easy access to all relevant data.



### Work Orders

Integrates seamlessly with your work order management system to update both field and office crews on open, pending, and completed work orders.



### Leaks

Allows field crews to isolate the right valve to shut off in the event of pipe and main leaks, even displaying which parcels will be affected by the shutoff.



### Dig Alerts

Displays location of dig alert coordinates, making asset marking and documentation fast, accurate and easy.



### Valve Exercising

Syncs with equipment to record turns & torque required, displaying historical data to guide assessment of maintenance, repair or replacement needs.



### Flushing

Gauges water lost during mandated hydrant flushing, allows for data input & reporting, and offers franchise access to historical data.



### Enterprise Systems

Custom modules for enterprise system integration and support, including SCADA, CMMS, GIS, AVL, LIMS and more.

mobilegis.com

NIBEL

# GeoViewer Mobile

**Powerful. Portable. Practical.**  
*An application designed to transform the way field crews interact with GIS technology*

**Snapshots**  
Snap images of assets in need of repair or maintenance, areas flagged and marked before digging, or even meter reads

**Video**  
Record incidents such as leaks or breaks to help determine water lost and prioritize repair or replacement

**Voice to Text**  
Voice to text capability allows crews to speak their notes, creating more comprehensive digital archives

**Searching made easy**  
*Find what you need by:*

Owner Name | Parcel Number | Address | Account Number | Hydrant or Valve Number | And More

**Historical Data**  
View customer data, work history, service calls, utility design drawings, SOP manuals and more

**Field Notes**  
Intuitive recording of location specific data provides for easy documentation of institutional knowledge

**Document Finder**  
Access relevant documents in your vicinity with the touch of a finger

# Intelligent Infrastructure – A Game Changer

In the coming days, success and failure of nations will be determined by how well they plan and manage the rapid urbanization, optimize the Utility Infrastructure, manage their natural resources – all in an environmental friendly and sustainable way. Some steps to get there

- Break the Silo's of Information
- Integrate and analyze Geo-spatial data from different sources and come up with solutions to pressing and complex problems of infrastructure, inclusive growth & sustainability.
- Embrace technologies and innovate so that the poorest of poor can benefit
- Push GIS enabled applications to smartphones and tablets making it omnipresent
- Bring down the cost of ownership





# Thank You

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