



# BWS Enterprise GIS

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Honolulu Board of Water Supply

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# Today's Topics

- HBWS Overview
- Systems And Technology
- Application Showcase
  - HONU, MANO, Redliner, Media Pack, GISMO, Hydraulic Modeling/Isolation, Document Management, GPS, Accelerator, XMF Alerter
- Work Flow Example – Leak in Road

# Established in 1929, HBWS is a Semi-Autonomous Agency Of City and County of Honolulu

- GIS Program established 1989
- Largest municipal water utility in the State
- Primary Function is to Provide Municipal Water and Fire Protection for Oahu
- Serves One Million Customers On Oahu, & Provides Support Services To Maui & Kauai

## Staff Of More Than 600 Employees

- Delivers 55 Billion Gallons of Water/ Year
- 164 Reservoirs and 104 Water Sources
- 2,000 Miles of Pipeline
- 171,000 Metered Connections





# External Agencies

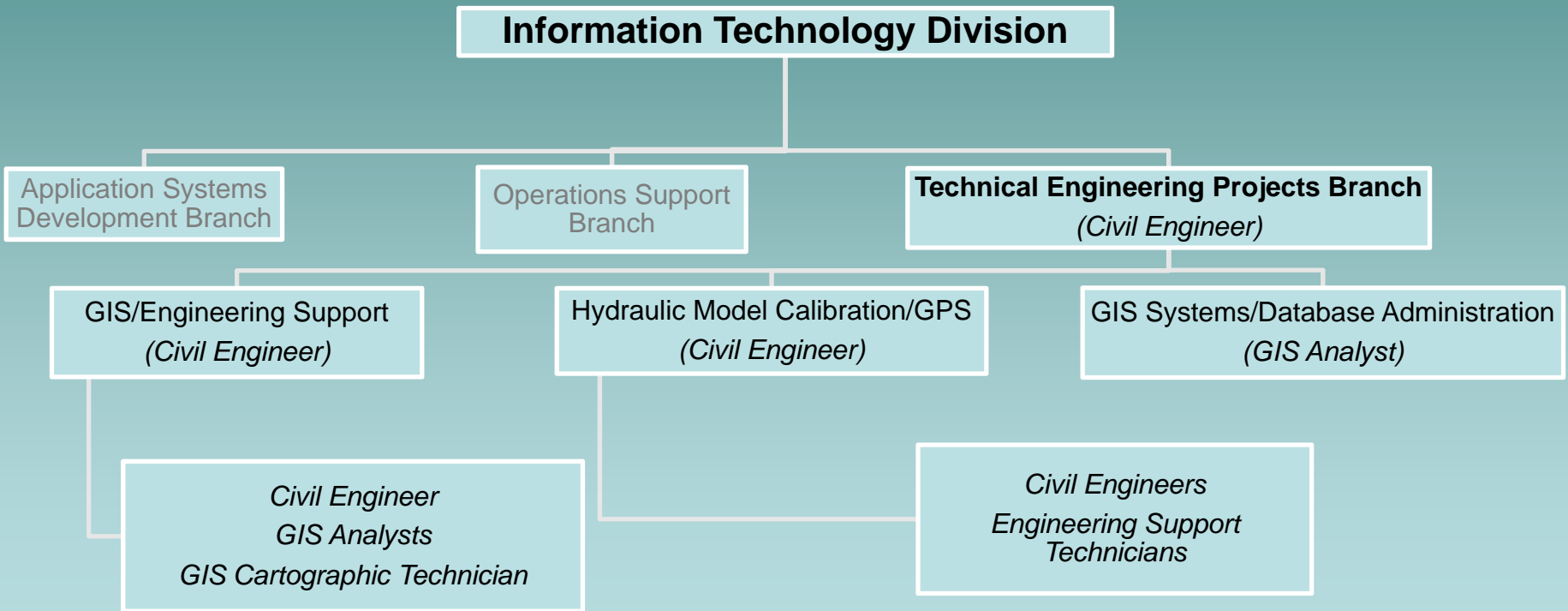
- Data sharing with City/County for common layers (parcels, street centerlines, landmarks, other utilities, zoning, disaster preparedness, political districts, etc.)
- City maintains relationships with other external agencies (state, federal, other utilities, etc.)



View of Downtown Honolulu area taken from the top of the Frank F. Fasi Municipal Building.



# Technical Engineering Branch



## GIS Team

- Data Editing, Hydraulic Modeling, Redlining, Analytics, WMS support, Mobile mapping
- 10 staff working in many roles





# Systems and Technology

Systems Environment  
Backup and Recovery  
Virtualization





# Systems Environment

*3 Full  
Environments  
DEV, PROD,  
PUBLISH*

ESRI Site License  
ArcSDE (SQL-Server),  
ArcGIS Server,  
ArcINFO, ArcEditor,  
ArcEngine, Flex, Silverlight  
Python, Model Builder  
SDE (batch scripts and API)  
XMF Alerter



# Backups

- SQL-Server backups for all databases
- Application backups



# Virtualization

- Executive-level decision to reduce hardware costs, save on power and centralize resources.
- Application and Database servers
- GIS team is hands-on with IT to make sure everything works well – database backups, performance, etc.



# Application Showcase

HONU

Media Pack

XMF Alerter

MANO

Document

Accelerator

GISMO

Manager

Hydraulic

Redliner

Isolation

Modeling

GPS



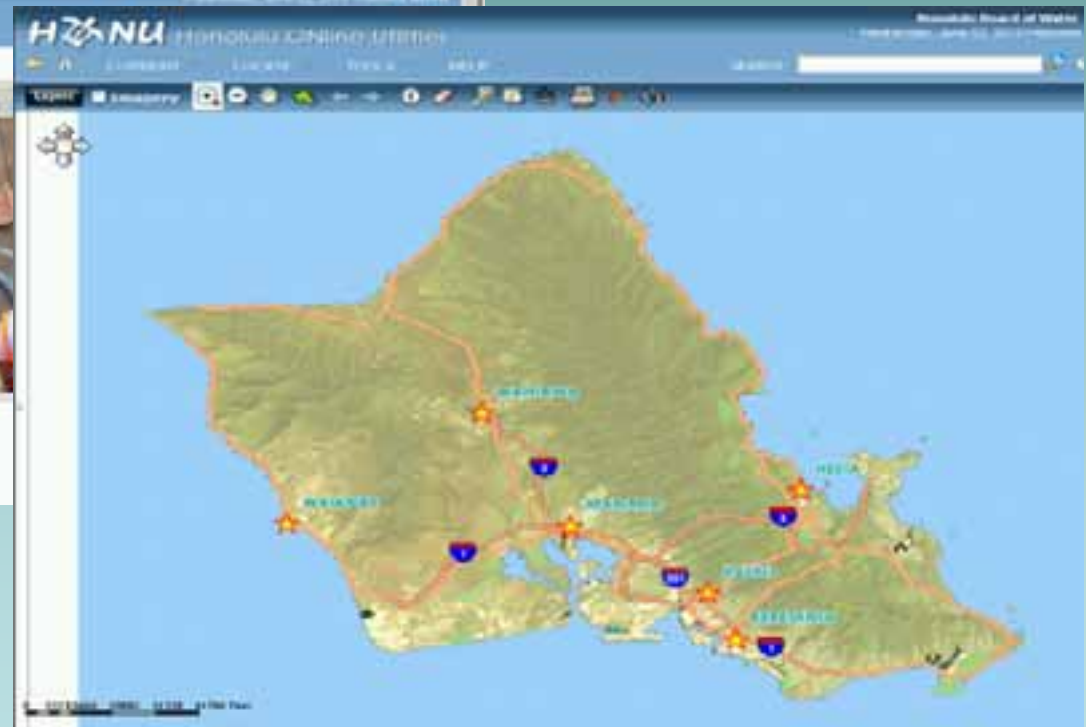
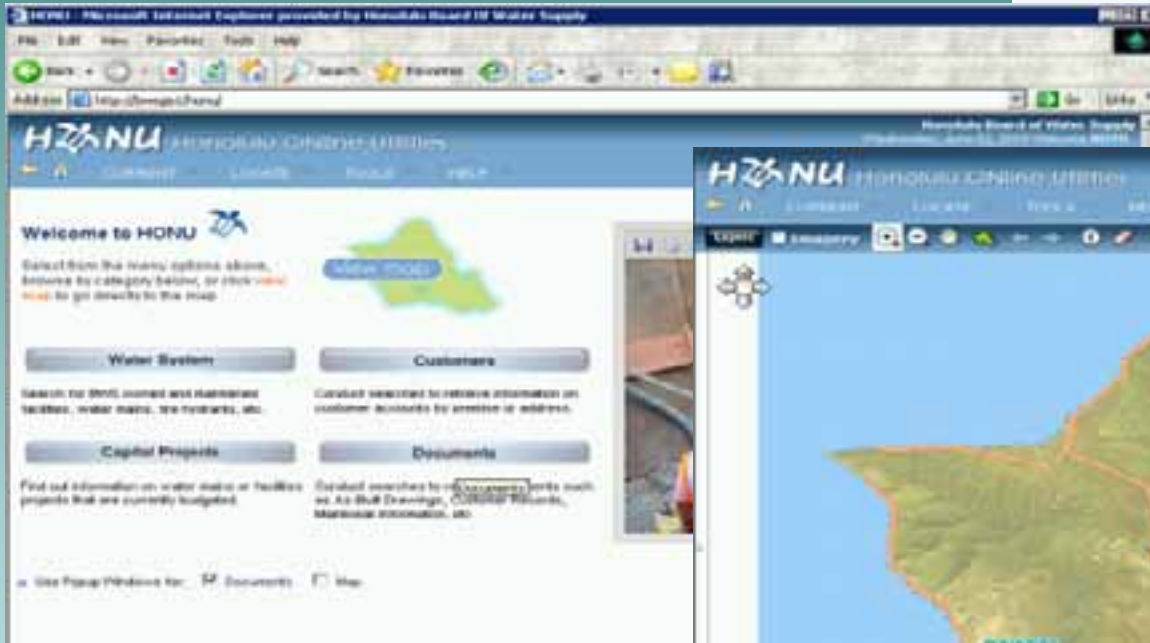


# HONU

Data-driven Enterprise web viewer

500+ users

ArcGIS Server – Silverlight

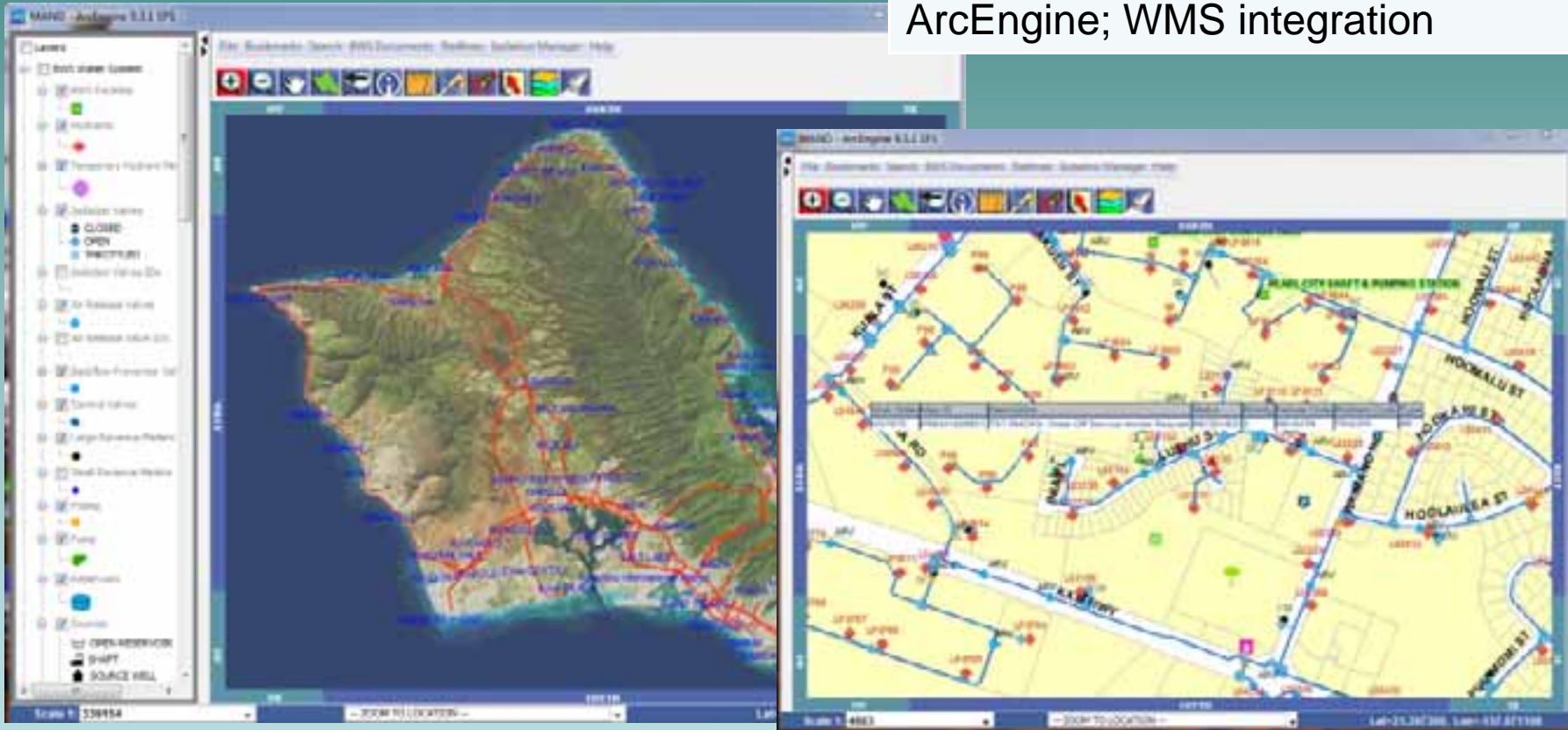


# MANO

Field - Mobile Asset Ntebook

100+ users

ArcEngine; WMS integration



Complete Extract and Sync Framework

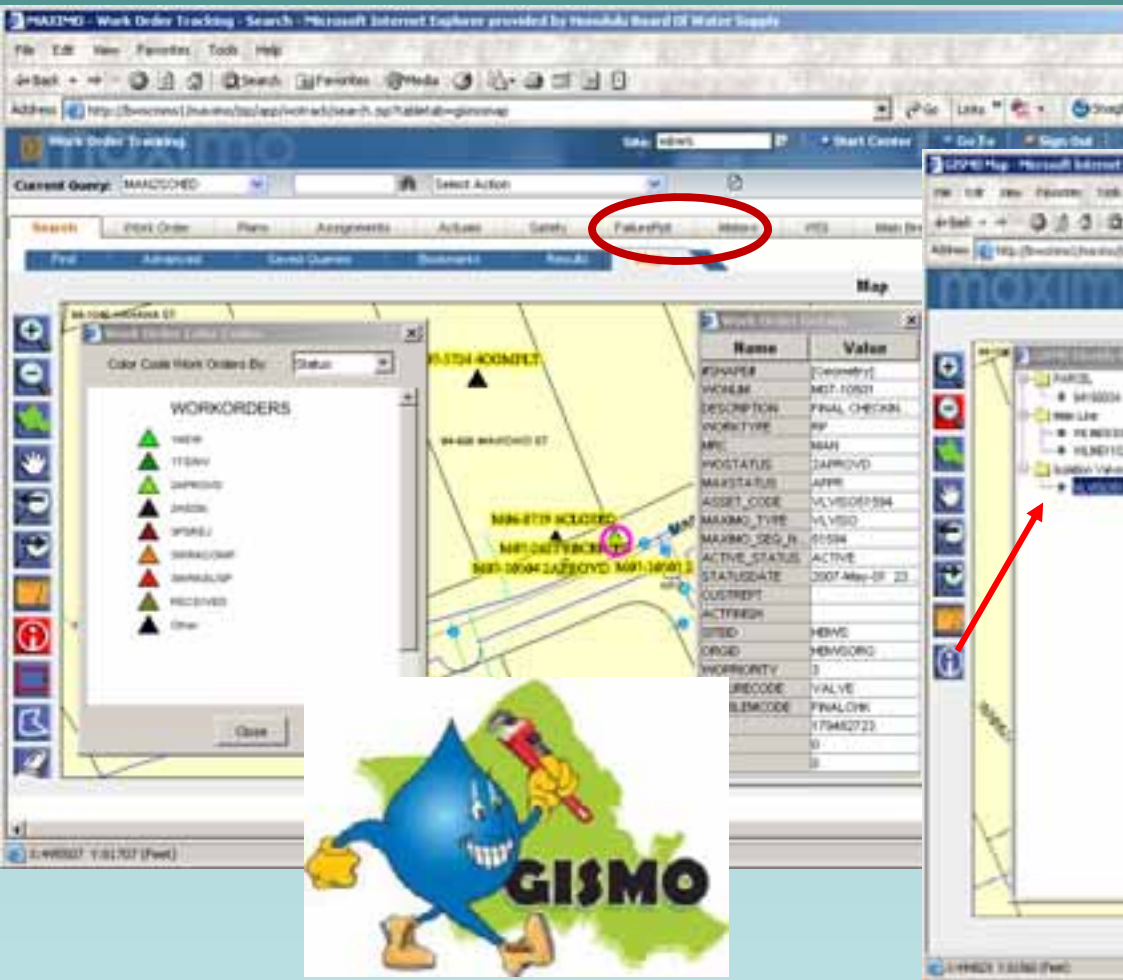


# GISMO

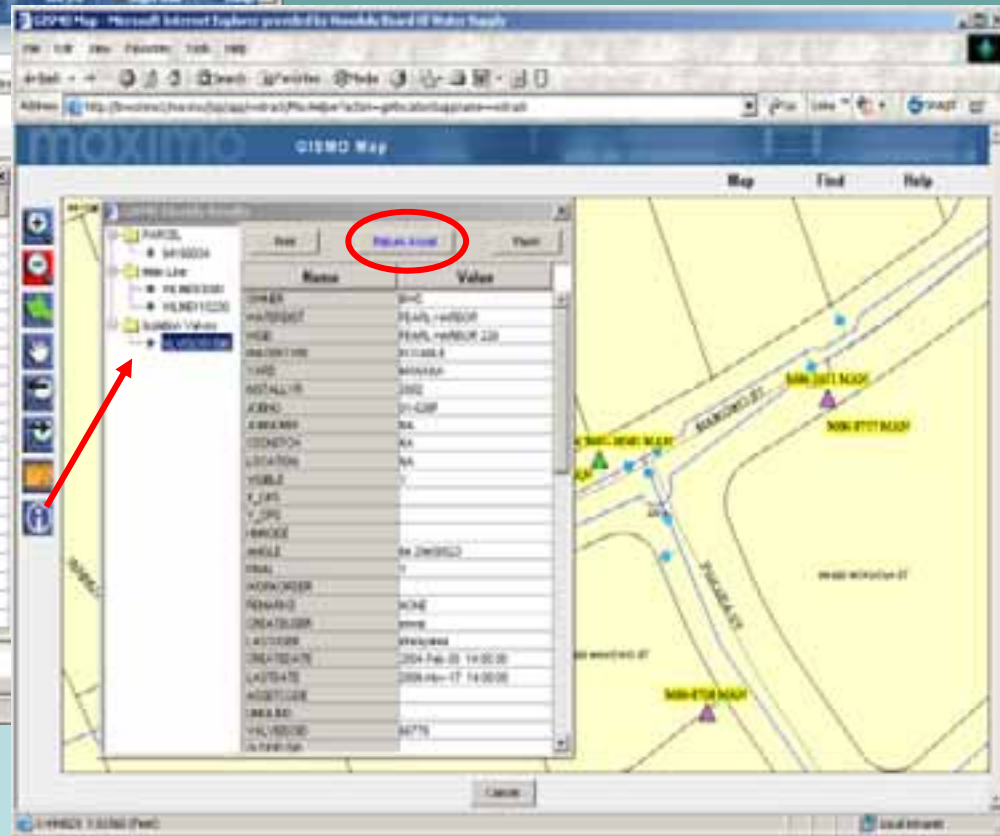
Desktop Work Management Viewer

50+ users

IBM-Maximo/ArcIMS integration



The screenshot shows the GISMO desktop application interface. At the top, it says "Work Order Tracking" and "Current Query: MAINTCND". Below this is a navigation menu with options like "Find", "Advanced", "Saved Queries", and "New". A "Map" window is open, displaying a map with several work order locations marked with colored triangles. A "Legend" window is also open, showing a list of "WORKORDERS" with corresponding symbols and colors. A table of data is visible on the right side of the map window, listing various attributes like "Name", "Value", "DESCRIPTION", "MFI", "MSTATUS", "MSTATUS", "ASSET\_CODE", "MAXMO\_TYPE", "MAXMO\_ORG\_ID", "ACTIVE\_STATUS", "STATUSDATE", "CUSTREF", "ACTFRSH", "SPID", "ORGO", "MORORITY", "RECODE", "VALVE", and "BLEMCODE". A red circle highlights the "Find" button in the top navigation menu.



The screenshot shows the GISMO desktop application interface. At the top, it says "GISMO Map" and "Current Query: MAINTCND". Below this is a navigation menu with options like "Find", "Advanced", "Saved Queries", and "New". A "Map" window is open, displaying a map with several work order locations marked with colored triangles. A "Legend" window is also open, showing a list of "WORKORDERS" with corresponding symbols and colors. A table of data is visible on the right side of the map window, listing various attributes like "Name", "Value", "DESCRIPTION", "MFI", "MSTATUS", "MSTATUS", "ASSET\_CODE", "MAXMO\_TYPE", "MAXMO\_ORG\_ID", "ACTIVE\_STATUS", "STATUSDATE", "CUSTREF", "ACTFRSH", "SPID", "ORGO", "MORORITY", "RECODE", "VALVE", and "BLEMCODE". A red circle highlights the "Find" button in the top navigation menu. A red arrow points from the "Find" button in this screenshot to the "Find" button in the previous screenshot.





# Redliner

Enterprise “Feedback Loop”

500+ users

Web, Mobile and Desktop integration

The screenshot shows the Redliner GIS application interface. The main map displays a network of water lines (ARV, KAMAHA PL, AIKOO PL, LUENU ST, LUENU PL) and various valves (L02132, L02133, L02131) and hydrants (L02132, L02133). A red valve symbol is highlighted with a callout box stating "Valve requires 1 1/4 turns". Another callout box states "Hydrant is in neighboring parcel". The interface includes a toolbar on the left with various GIS tools, a "Tools" menu, and a "Text" input field. At the bottom, there are buttons for "Submit", "eMail", "Print", "Locate", and "Save". On the right side, there is a "Hydrant List" panel with fields for "Title", "User Name", "Drawer", "Unit", and "Notes". A pop-up window titled "Attribute Editor" is open, showing a table of attributes for a valve.

Name	Original value	New value
MANO ID	54537	54537
Owner	PRIVATE	PRIVATE
Water District	PEARL HARBOR	ARMY
Install Year	1979	FEDERAL
Job No	79-0003	NAVY
Sketch No	881	OTHER
Valve Type	GATE	PRIVATE
Label		STATE
Status	OPEN	UNKNOWN
Material		UNKNOWN
Cover Size	UNKNOWN	UNKNOWN



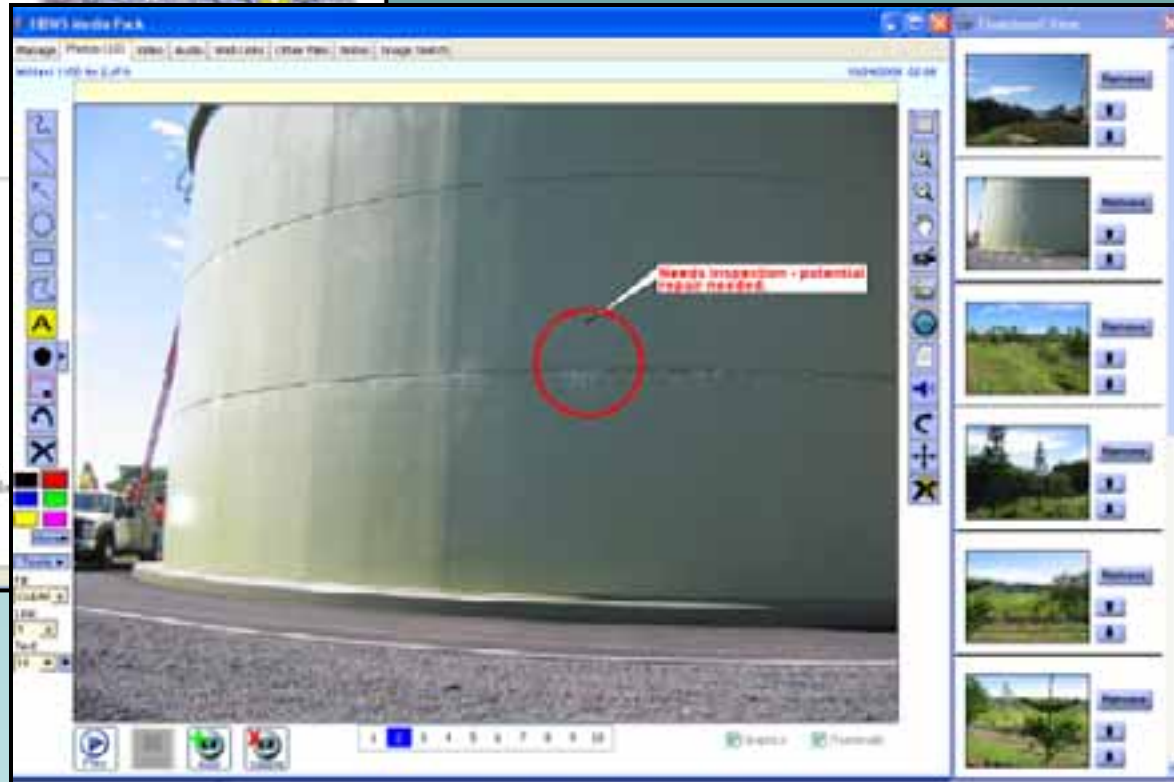
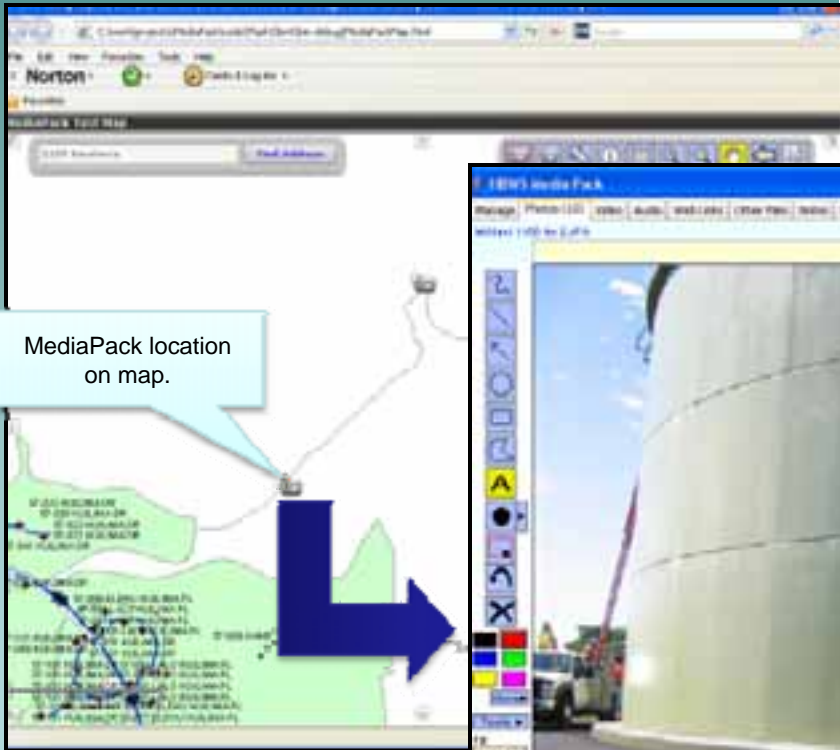


# Media Pack

Enterprise Geo-Referenced Multi-media

50+ users

Web integration – Desktop, Mobile to follow



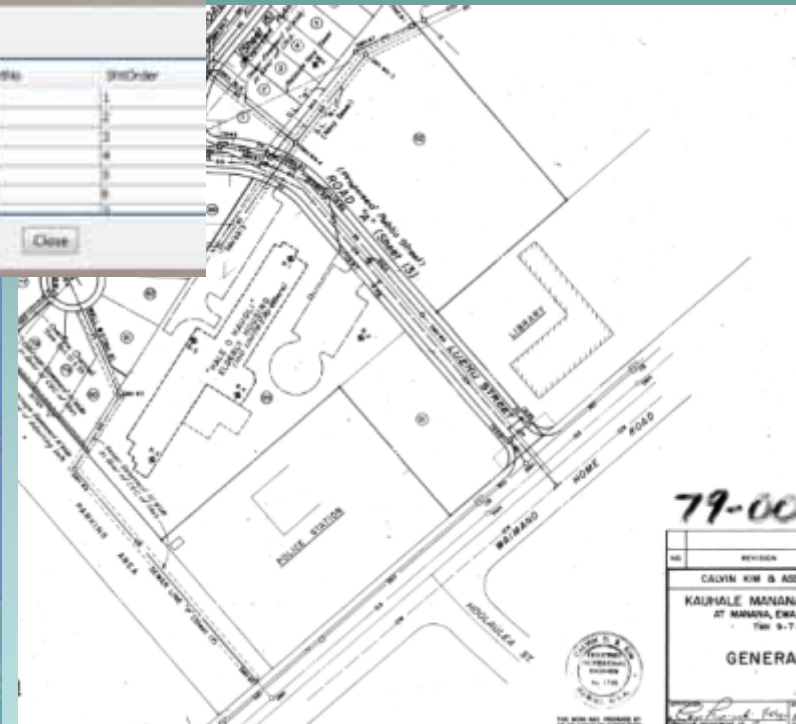
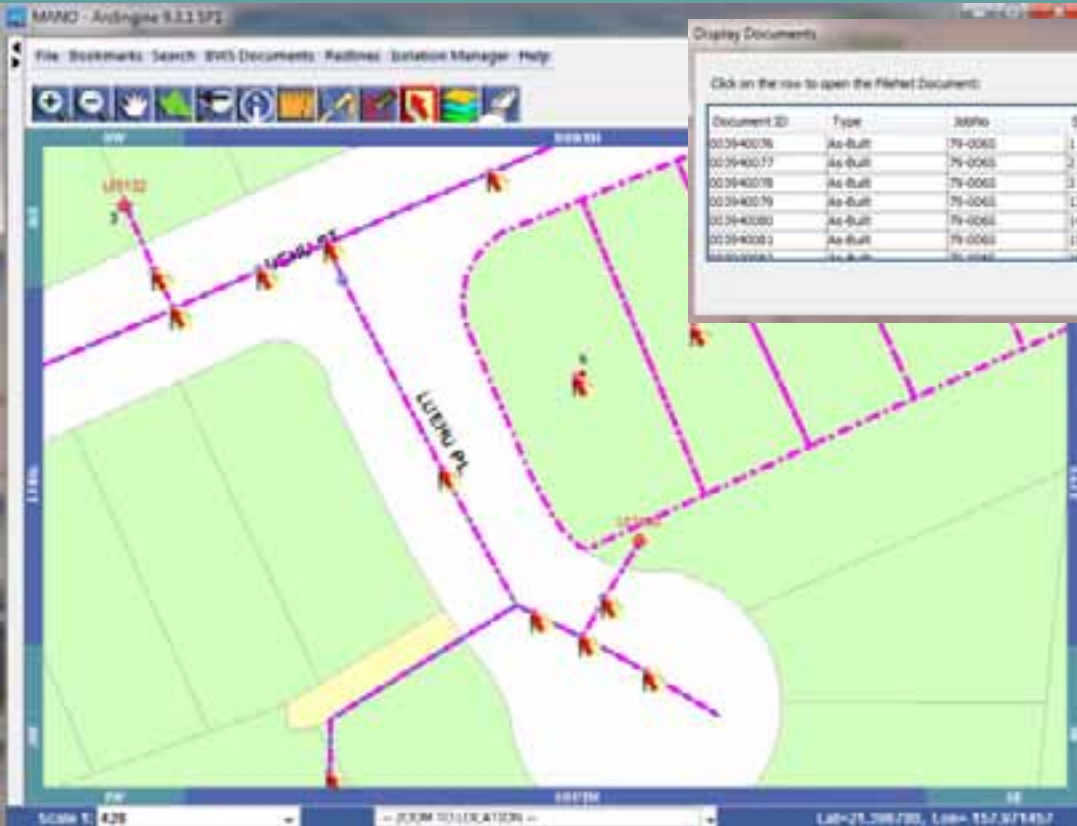


# Document Manager

Web-Service Document Query/Download

500+ users

FileNet and SharePoint integration





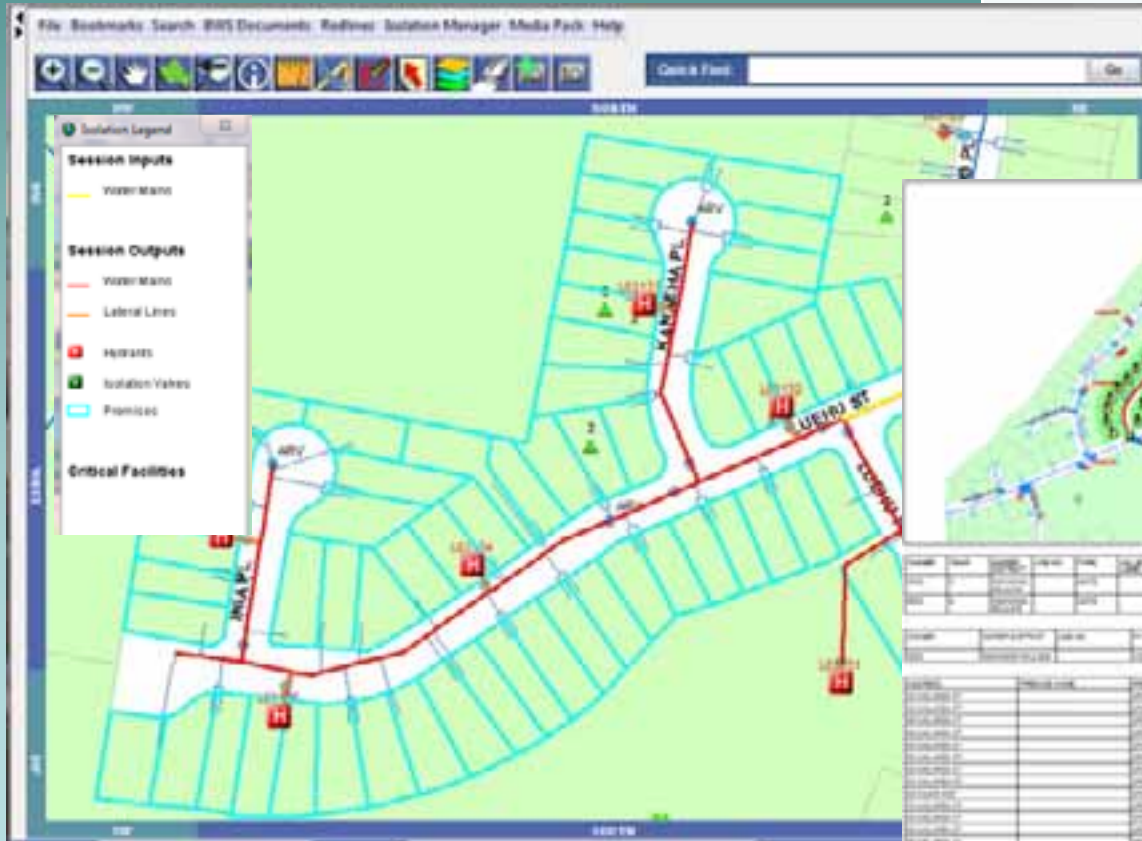


# Valve Isolation

Network-based Outage Support

50+ users

Mobile integration – Web to follow



ID	Name	Asset Type	Location	Status	Notes
1001	Valve 1	Valve	1001	Open	
1002	Valve 2	Valve	1002	Open	
1003	Valve 3	Valve	1003	Open	
1004	Valve 4	Valve	1004	Open	
1005	Valve 5	Valve	1005	Open	
1006	Valve 6	Valve	1006	Open	
1007	Valve 7	Valve	1007	Open	
1008	Valve 8	Valve	1008	Open	
1009	Valve 9	Valve	1009	Open	
1010	Valve 10	Valve	1010	Open	
1011	Valve 11	Valve	1011	Open	
1012	Valve 12	Valve	1012	Open	
1013	Valve 13	Valve	1013	Open	
1014	Valve 14	Valve	1014	Open	
1015	Valve 15	Valve	1015	Open	
1016	Valve 16	Valve	1016	Open	
1017	Valve 17	Valve	1017	Open	
1018	Valve 18	Valve	1018	Open	
1019	Valve 19	Valve	1019	Open	
1020	Valve 20	Valve	1020	Open	
1021	Valve 21	Valve	1021	Open	
1022	Valve 22	Valve	1022	Open	
1023	Valve 23	Valve	1023	Open	
1024	Valve 24	Valve	1024	Open	
1025	Valve 25	Valve	1025	Open	
1026	Valve 26	Valve	1026	Open	
1027	Valve 27	Valve	1027	Open	
1028	Valve 28	Valve	1028	Open	
1029	Valve 29	Valve	1029	Open	
1030	Valve 30	Valve	1030	Open	
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1036	Valve 36	Valve	1036	Open	
1037	Valve 37	Valve	1037	Open	
1038	Valve 38	Valve	1038	Open	
1039	Valve 39	Valve	1039	Open	
1040	Valve 40	Valve	1040	Open	
1041	Valve 41	Valve	1041	Open	
1042	Valve 42	Valve	1042	Open	
1043	Valve 43	Valve	1043	Open	
1044	Valve 44	Valve	1044	Open	
1045	Valve 45	Valve	1045	Open	
1046	Valve 46	Valve	1046	Open	
1047	Valve 47	Valve	1047	Open	
1048	Valve 48	Valve	1048	Open	
1049	Valve 49	Valve	1049	Open	
1050	Valve 50	Valve	1050	Open	

Valves

Hydrants

Customers

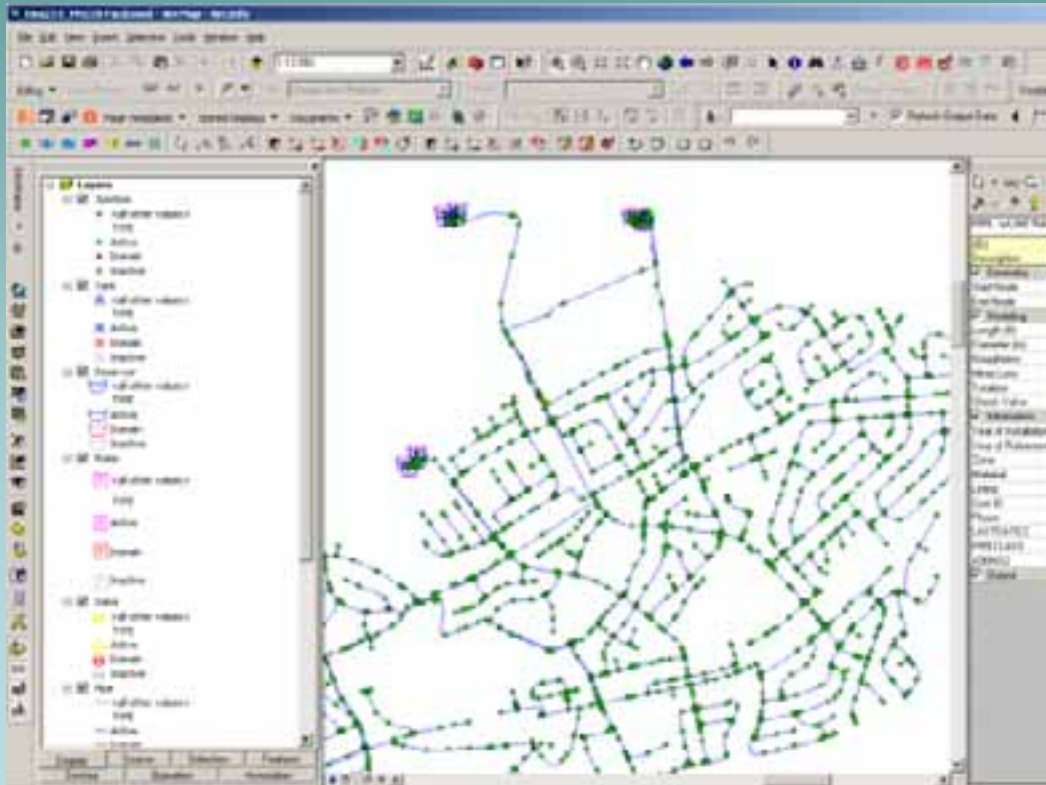


# Hydraulic Modeling

GIS-driven model creation,  
calibration and analysis

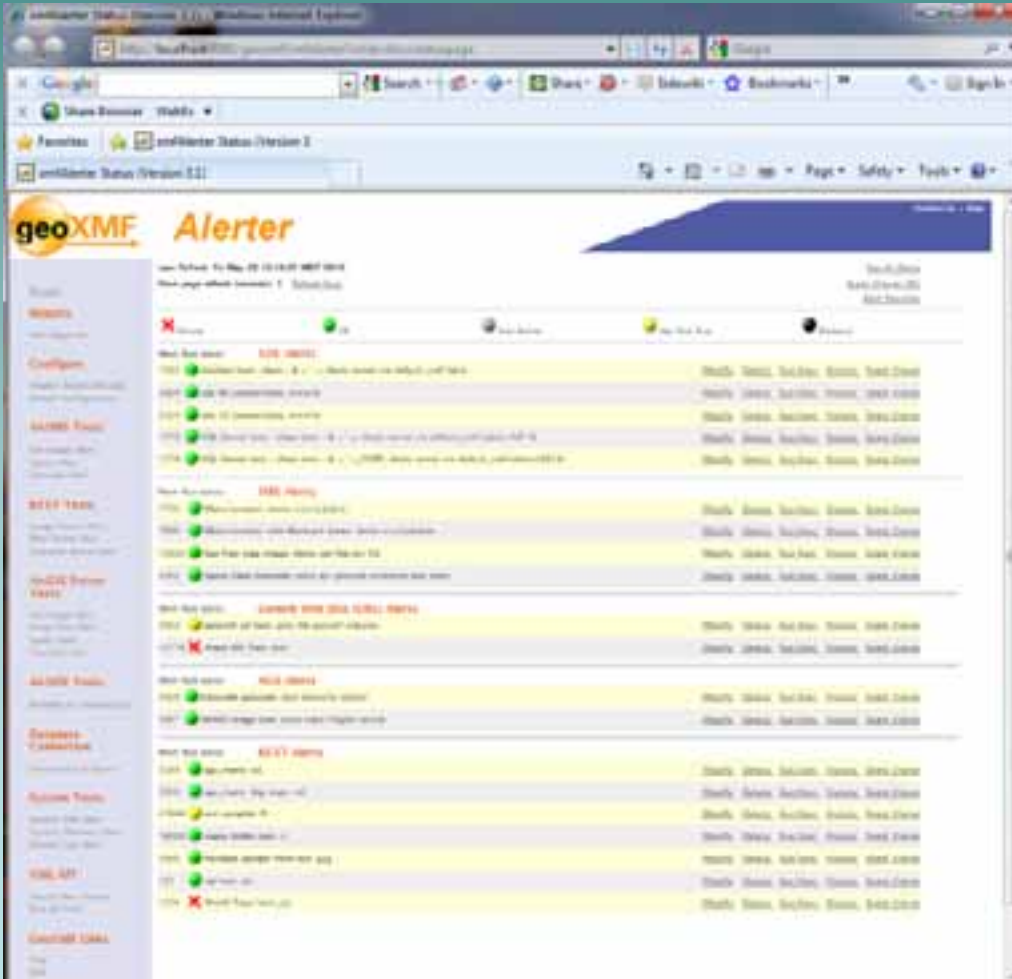
10+ Users

ArcGIS Model Builder, MWHSoft





# XMF Alerter



Enterprise Monitoring and Notification

10+ Users

Real-time monitoring for GIS stack



# XMF Accelerator

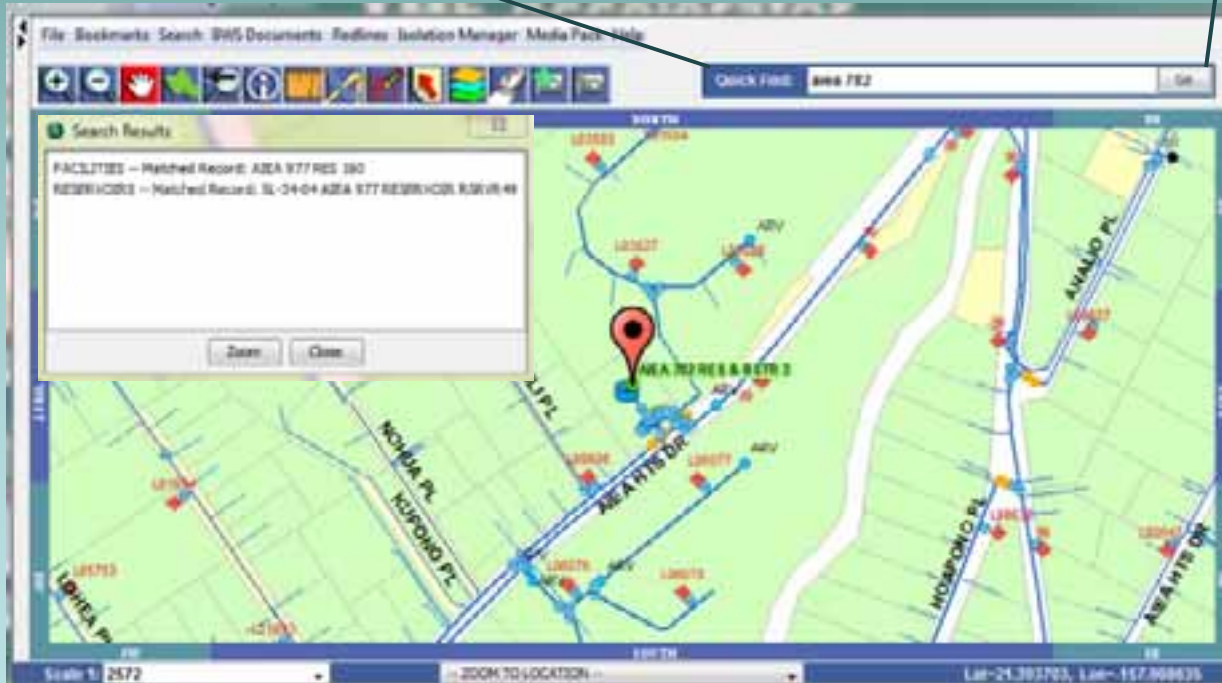
Quick Find: **aiea 782**

Go

Google-like Index and Search

2.5 million records

Crawls GIS data layers to support unstructured queries



# Workflow Example

- Show use of integrated GIS/Maximo/Hydraulic Model/CIS/SharePoint to perform work
- Example – Leak in Road
  - Call Center receives call from public about water on road
  - Maximo work order generated to investigate
  - Planner/Scheduler assigns WO to crew



# Workflow Example

- Example – Leak in Road (con't)
  - Crew Lead down loads WO to laptop
  - Crew Lead uses HONU/MANO/SharePoint to obtain as-builts and other pertinent information
  - MANO used to determine isolation valves
  - Redliner used to note valve closures, water wagon location, work to be done, etc. and emailed to Supervisors, Dispatch, Comx, etc.





# Workflow Example

- Example – Leak in Road
  - Valve found during work missing from GIS
  - Redliner used to note valve location and other asset information and sent to GIS editors
  - GIS updated with new valve
  - New valve AssetID and attribute information sent to Maximo





# Workflow Example

- Example – Leak in Road
  - MediaPack used to document asset information (mainbreak location, pipe condition, property damage)
  - Mainbreak information entered into GIS
  - Main replacement project generated based on mainbreak frequency



# Workflow Example

- Example – Leak in Road
  - Hydraulic model used to analyze proposed main replacement project
  - CIS/SCADA data used to calibrate model
  - Mainline upsized to meet water system standards
  - Main replacement project designed and constructed



# Workflow Example

- Example – Leak in Road
  - New assets GPS'd
  - New as-builts scanned and stored in SharePoint
  - New assets entered in GIS
  - New GIS assets information sent Maximo
  - New asset information in GIS used to update hydraulic model





## Questions?

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