Implementing GIS for Enterprise Mobile Workflows

City of Oceanside, California
Water Utilities Department

Talli Carey, GISP
TCarey@ci.oceanside.ca.us

Saeid Noori Bushehri, GISP
SNooriBushehri@ci.oceanside.ca.us

Oceanside, CA

Area of City: 42 sq. miles

Location: San Diego County - Coastal,
35 miles north of San Diego
83 miles south of Los Angeles

Population: 179,681

Public Beaches: 3.5 miles

City of Oceanside

Year of Incorporation: **1888**

Type of Government: **Council/Manager**

Number of Employees: **900**

Number of Departments: **16**

Water Utilities Department

Water Utilities Department has 136 employees.

- **Water:**
  - >550 miles of pipelines, 13 reservoirs,
  - 26 pump stations, >15000 system valves,
  - >5800 fire hydrants
- **Sewer:**
  - > 450 miles of pipelines,
  - 2 wastewater treatment plants ,
  - 34 sewer lift stations, 11000 manholes

GIS Division

- GIS Division is under Water Administration.
- It serves all Water Utilities Department's employees as well as other departments and divisions in the City.
- **Up until the late 80's we used hand drafted base maps for our water and sewer lines.**
- **In 1988 the water and sewer base maps were put into AutoCAD.**
- The GIS Program was approved in 2000

Enterprise GIS Servers

Database and Application Servers

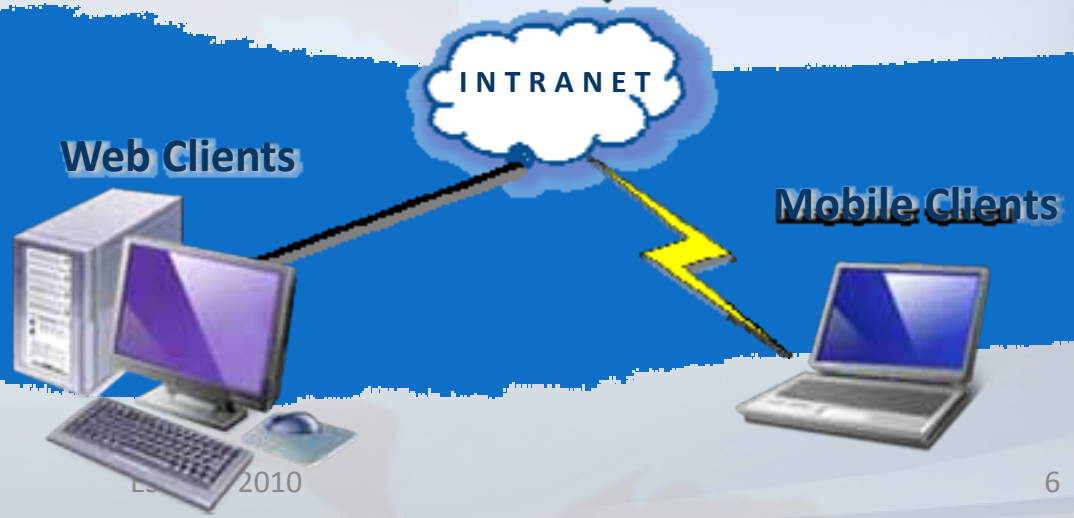
- SQL 2005
- GBA 6.75

- SQL 2005
- ArcSDE 9.3
- ArcGIS Server 9.3

- Mapplet.NET 4.1
- ArcIMS 9.3
- Field Mapplet 2.0

File Server

- GIS FILES
- LiDAR Data
- CAD Drawings
- Field Photos



GIS User Levels

- All city employees
- Water Utilities Department employees
- **Field crew – mobile GIS**

The Challenges

- Become more efficient in Field Operations while utilizing GIS
- Budget Constraints & Limited Resources
- Implementing Mobile GIS with multiple groups involved
- Integration with existing programs
- Getting everyone to buy in
- Keeping it Simple

Approach

- Go After the quickest ROI “Low Hanging Fruit”
- Adopt a COTS mobile solution (no time or $ to reinvent the wheel)
- Bring the parties involved together and keep everyone in the loop
  - Operations
  - GIS
  - IT

Approach

- Understand the end user and try to satisfy their needs
- Find the champion
- Implement a solution that supports the work and doesn't create more work for the end user
- Sometimes less is more

Solution

- Adopted Field Mapplet for operations
- Reinforce a strong GIS team in a supportive role
- Creation of a committee with representatives from each division
- Implement Spatial Wave Redlines extension for field verification and GIS data correction

Solution

Deploy Field Mapplet and train water and sewer field crew for the following mobile extensions:

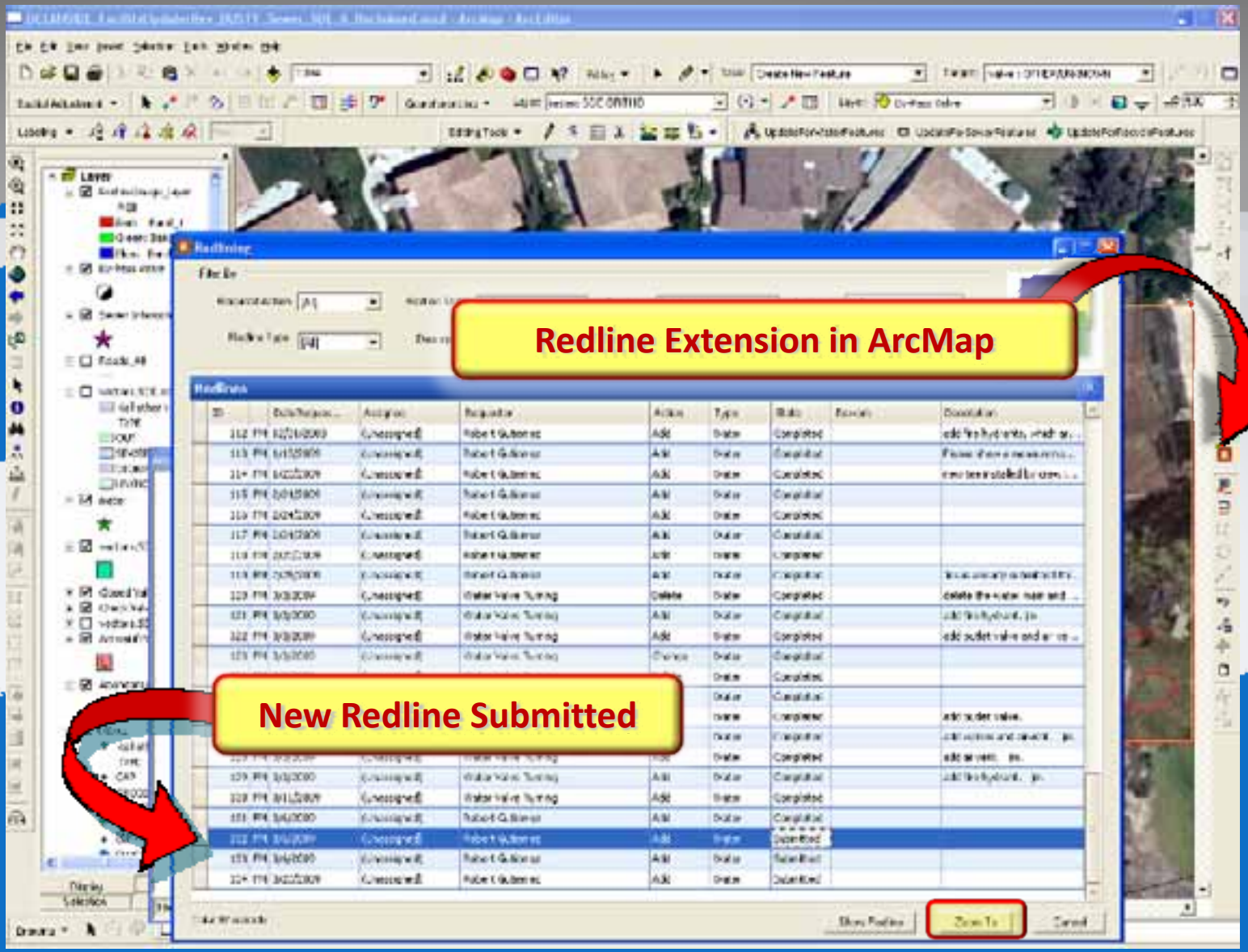
- USA Tickets (“Call Before you Dig”)
- Valve Turning
- Hydrant Flushing
- Work Requests
- Redlines

GPS-enabled Tracking

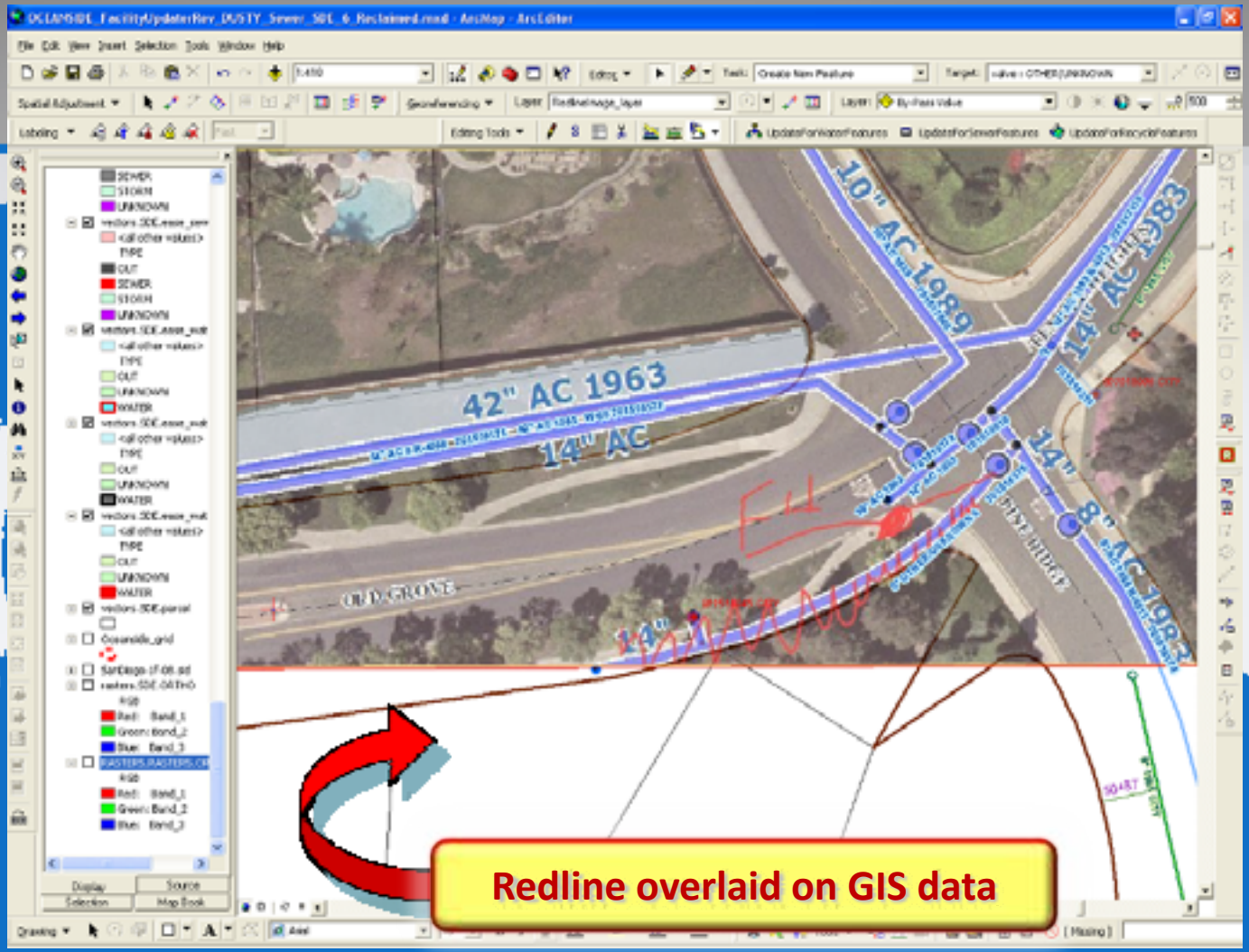
GPS-enabled Tracking is available through the Field Mapplet and it can navigate the crew to their assignment locations

Field Mapplet Redlines Extension

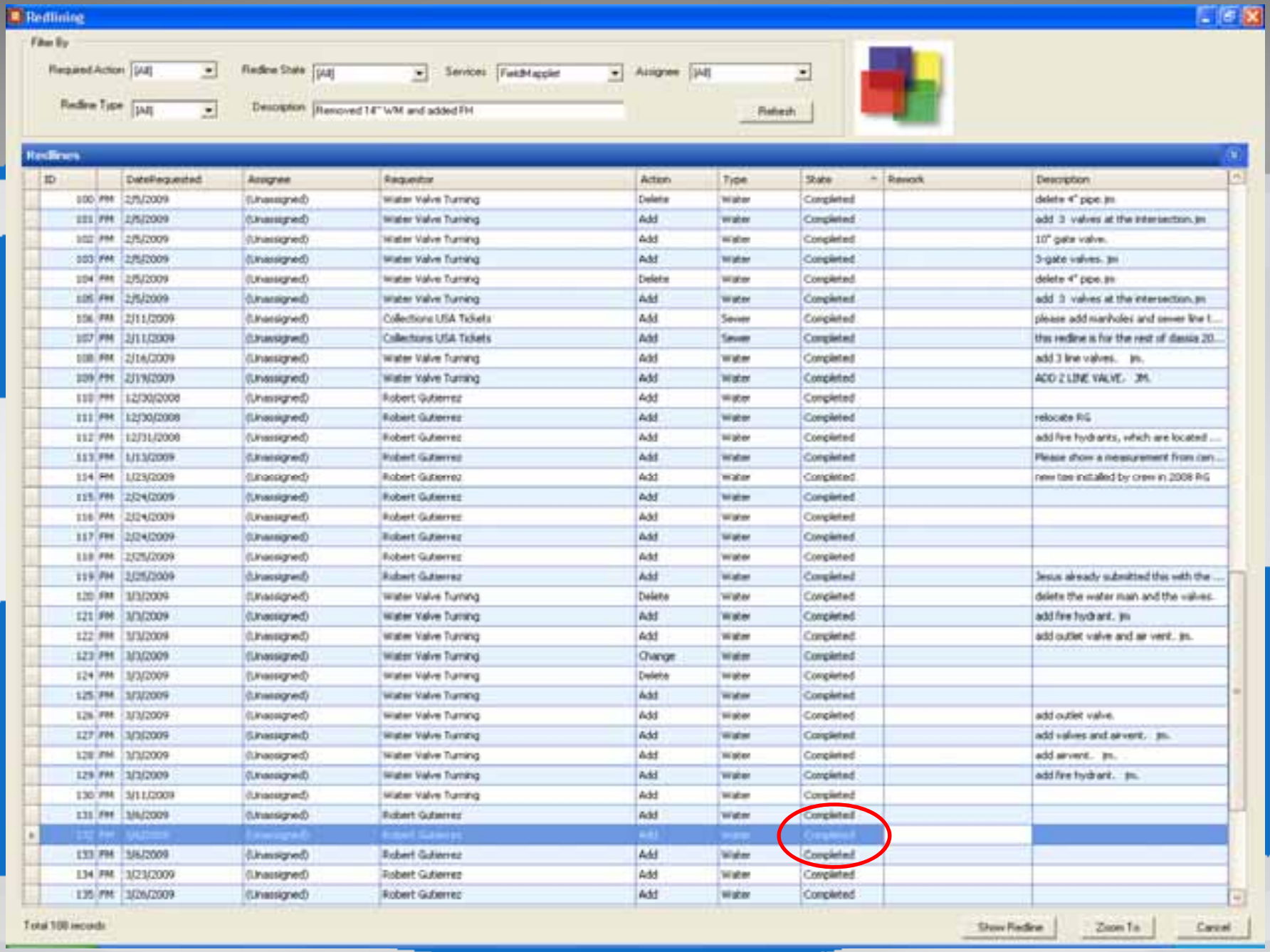
Enables the field crew to send changes to GIS data in a convenient manner for both field crew and GIS team. It is simply a map markup tool to create geo-referenced sketch overlay.



Once the redline is saved in the field, the Redline tool can be viewed and opened in ArcMap. It Brings up the Redline window showing all submitted redlines.



Can toggle on and off the Redline overlay.


Redlining
Filter By
Request Action [All]
Redline State [All]
Services FieldMapper
Assignee [All]
Redline Type [All]
Description Removed 14" WM and added FH
Refresh
Redlines
ID
DateRequested
Assignee
Requestor
Action
Type
State
Rework
Description
100 PM 2/5/2009 (Unassigned) Water Valve Turning Delete Water Completed delete 4" pipe. jm
101 PM 2/5/2009 (Unassigned) Water Valve Turning Add Water Completed add 3 valves at the intersection. jm
102 PM 2/5/2009 (Unassigned) Water Valve Turning Add Water Completed 10" gate valve.
103 PM 2/5/2009 (Unassigned) Water Valve Turning Add Water Completed 3-gate valves. jm
104 PM 2/5/2009 (Unassigned) Water Valve Turning Delete Water Completed delete 4" pipe. jm
105 PM 2/5/2009 (Unassigned) Water Valve Turning Add Water Completed add 3 valves at the intersection. jm
106 PM 2/11/2009 (Unassigned) Collections USA Tickets Add Sewer Completed please add manholes and sewer line t...
107 PM 2/11/2009 (Unassigned) Collections USA Tickets Add Sewer Completed this redline is for the rest of dassia 20...
108 PM 2/14/2009 (Unassigned) Water Valve Turning Add Water Completed add 3 line valves. jm.
109 PM 2/19/2009 (Unassigned) Water Valve Turning Add Water Completed ADD 2 LINE VALVE. JM.
110 PM 12/30/2008 (Unassigned) Robert Gutierrez Add Water Completed
111 PM 12/30/2008 (Unassigned) Robert Gutierrez Add Water Completed relocate RG
112 PM 12/31/2008 (Unassigned) Robert Gutierrez Add Water Completed add fire hydrants, which are located ....
113 PM 1/13/2009 (Unassigned) Robert Gutierrez Add Water Completed Please show a measurement from cen...
114 PM 1/23/2009 (Unassigned) Robert Gutierrez Add Water Completed new tee installed by crew in 2008 RG
115 PM 2/24/2009 (Unassigned) Robert Gutierrez Add Water Completed
116 PM 2/24/2009 (Unassigned) Robert Gutierrez Add Water Completed
117 PM 2/24/2009 (Unassigned) Robert Gutierrez Add Water Completed
118 PM 2/25/2009 (Unassigned) Robert Gutierrez Add Water Completed
119 PM 2/25/2009 (Unassigned) Robert Gutierrez Add Water Completed Jesus already submitted this with the ...
120 PM 3/3/2009 (Unassigned) Water Valve Turning Delete Water Completed delete the water main and the valves.
121 PM 3/3/2009 (Unassigned) Water Valve Turning Add Water Completed add fire hydrant. jm
122 PM 3/3/2009 (Unassigned) Water Valve Turning Add Water Completed add outlet valve and air vent. jm.
123 PM 3/3/2009 (Unassigned) Water Valve Turning Change Water Completed
124 PM 3/3/2009 (Unassigned) Water Valve Turning Delete Water Completed
125 PM 3/3/2009 (Unassigned) Water Valve Turning Add Water Completed
126 PM 3/3/2009 (Unassigned) Water Valve Turning Add Water Completed add outlet valve.
127 PM 3/3/2009 (Unassigned) Water Valve Turning Add Water Completed add valves and airvent. jm.
128 PM 3/3/2009 (Unassigned) Water Valve Turning Add Water Completed add airvent. jm.
129 PM 3/3/2009 (Unassigned) Water Valve Turning Add Water Completed add fire hydrant. jm.
130 PM 3/11/2009 (Unassigned) Water Valve Turning Add Water Completed
131 PM 3/6/2009 (Unassigned) Robert Gutierrez Add Water Completed
133 PM 3/6/2009 (Unassigned) Robert Gutierrez Add Water Completed
134 PM 3/23/2009 (Unassigned) Robert Gutierrez Add Water Completed
135 PM 3/26/2009 (Unassigned) Robert Gutierrez Add Water Completed
Total 100 records
Show Redline
Zoom To
Cancel

Efficiency Improvement

- Cost savings
- Workflow streamlining and automation
- Central data management
- Reducing the flow of paper documents/forms and redundant data entry
- Meeting required government reporting mandates more efficiently

Lessons Learned

- There needs to be a person to drive the communication
- Train the user, follow up, then train some more
- Strong GIS Team/IT support
- Make sure your hardware is in order
- Realize and present the benefits (ROI is what will help justify future funding)
- Customization helps the crew to use it more extensively and efficiently

The Future

- Deploy digital as-builts to the field
- Complete work order/work requests & Field Mapplet integration
- Upgrade field hardware
- Create GIS Web Portals in Mapplet to display past work performed for analysis
- Continuing training