Mobile Field Construction Inspections for Water Utilities

Ming Zhao     Otay Water District
Leonel Torres  Otay Water District
Peter King     iWater Inc
Introduction

• Background of Otay Water District
• GIS at Otay
• Traditional construction inspection process at Otay
• Otay’s need
• The innovated GIS way
Otay Water District

- South California
- Special Water Agency
- Service Area: 125 square miles
- Serve population: 215,000
- Potable
- Recycle
- Sewer
Otay GIS Development Timeline

- **2001**: User Needs Analysis
- **2003**: Conversion From Paper/CAD
- **2005**: Data Model Geodatabase Design
- **2007**: Business Analysis for Mobile GIS
- **2009**: As-built Viewer
- **2011**: Permit Integration
- **2013**: AVL GPS Insight
- **2015**: Dig-Alert Dig Smart

**Applications**

- Atlas Book
- Mobile GIS
- Hydraulic Modeling InfoWater InfoSewer
- E-facility book
- As-built Viewer
- Dashboard Viewer
- Dig-Alert Dig Smart

**Data**

- Conversion From Paper/CAD
- Data Model Geodatabase Design
- Cluster Server ArcSDE Storage
- New Facilities Update and Redline
- Asset Management data

**Process**

- User Needs Analysis
- System Architecture Design
- Business Analysis for Mobile GIS
- Business Analysis for Data Update
- Asset Management interview

**Format**

- CAD
- Shapefile
- Personal Geodatabase
- Enterprise Geodatabase
User Requirements

- Daily Inspection work need the following info:
  - Project ID, Project Number;
  - Travel and on-site visit time
  - Weather
  - Description of the visit
  - List of contractors on site
  - Equipment on site
Previous web version

- VPN
- Remote desktop
- Launch the application
Field Staff’s Frustration

- Hard to make VPN connection
- Lost connection during the data entry
- Lost data
- Multiple interfaces for one task
- No geospatial info
- Simple form
Otay’s Needs

- GIS in the field
- Needed to be Esri based
- Efficient collection of construction assets in the field
- Eliminate paperwork in the field
- Simplified management of construction inspections
Field Solution

- infraMAP was selected as field data collection solution
- Eliminated paperwork in the field
- Eliminated duplication of effort
- GIS maps and functions in the field
- Fully disconnected – no need for Wi-Fi or VPN in the field
Implementation

- Esri ArcEngine based application - InfraMap as the platform
**Implementation**

- Enterprise data structure for inspection form
- All the inspection information stored in GIS SDE
- Check in/ check out replica to synch the network feature data
Implementation

- Customized form - flexible to edit, add and remove
Implementation

- Toughbook Batch file - to copy ixl file, landbase data, As-builts, photos and permit information to local machine.
Implementation

- Server batch file - to select and copy the engineering front counter data into the specific folder for synchronization
Before / After (Lost connection while data entry)
Before / After - New project on the site
Before / After (Attached the photos to dailies)
Inspection Form on InfraMap
Live Demo!
Questions?
Thank You!