Automating Manhole Inspections Using Cloud and Mobile Technology

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(OCSD) Service Area

463 Square Miles
2.6 Million Population
21 Cities, 2 Special Districts
207 Million Gallons per day
OCSD Collections System

• 579 Miles of Sewers
• 8,000+ Manholes
• 15 Pump Stations
• 2 Treatment Plants
• 5 Mile Ocean Outfall
OCSD's Manhole Inspection Program

Paper Inspections
Automating OCSD’s Manhole Inspection Program

Goals and Objectives

• Eliminate paper inspection process and forms
• Eliminate hand entry of inspection data
• Use mobile computing to enter inspection data
• Centralized database repository
• Eliminate delay of accessing current and historical inspection data
• Accurate, reliable and easy to use
• Create reports or dashboards
Selecting Trimble Navigation

Trimble Connect™

- Long relationship with Trimble
- Contacted by Trimble Water
- Initiated Proof of Concept
  - Adopted existing paper inspection form
  - Test Run including onsite training
  - Used variety of hardware and platforms
  - Gathered feedback to “fine tune”
- Created Manhole Inspection Application
- Included as part of the Trimble Connect Wastewater offering
Trimble Connect™

What is it?

- A powerful, integrated software platform for visualizing and managing your utility network maintenance and data collection activities.
- Leverages the power of Trimble GPS, Cloud and Esri’s mapping technologies.
- Offers core apps focused on Water, Wastewater and Stormwater specific workflow.
- Allows office users to log in from anywhere using a web browser to view latest GIS maps, dispatch work and manage field operations.
- Allows field users to leverage Trimble’s ruggedized high accuracy GPS handheld devices OR use their own devices.

For more information visit us at booth #1715
Trimble Connect™ - Manhole Inspector app

Key Features and Benefits
Log In

Secured communications using Standard Secure Socket Layer (SSL) technology
Trimble Connect™ - Manhole Inspector App
Interact with Map

- Identify GIS Features
- View Crew Location
- Toggle Layer Visibility
Create Work Orders - Select Manholes

Various selection tools

Plan for inspections
Select multiple assets and group them in a work order.
Create Work Orders - Search for Manholes

Plan for inspections. Search for and navigate to assets. Create Work Order from selected asset.
Group Manholes into Work Orders

Plan for inspections
Assets are grouped within the inspection work order
Login and View Work Orders

User Based Log-In

View List of Apps

View Work Order List

View Work Orders on Map
Mobile Workflows – Navigate to Work Order

1. Locate Work Order
   - Interact with Assets

2. Get Driving Directions

3. Progress Work Order Through Workflow

4. Locate Asset
Mobile Workflow – Manhole Inspection

1. View List of Assets with Progress
2. Perform Inspection
3. Take Pictures
4. Capture GPS
Supervisors Monitor Manhole Inspections Progress

Monitor asset maintenance and inspection progress
View Manhole Inspections Spatially
View Manhole Inspections Spatially
Working With Inspection Data

Leveraging ArcGIS Technology

- **File Export**
  - File Geodatabase format
  - Delta Changes or Date Range

- **ArcMap**
  - Connect to the cloud via secured services
  - View and interact with inspection data

- **ArcGIS Online**
  - Create Web Maps using Inspection data
  - Share with colleagues within your organization

Trimble Connect™

www.trimblewater.com
Benefits

Trimble Connect™ Manhole Inspector

- Streamlined inspection process
- Capture photos and GPS position
- Immediate access to the data
- Fewer Errors
- View sewer network and inspections spatially
- Better manage of inspection program
- Easier to manage updates to devices
- Staff by in
- Cost effective solution
Trimble Water

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