Integrating GIS and Asset Management

Sweetwater Authority

ESRI California / Hawaii / Nevada Regional User Group Conference
February 23-24, 2011
• Serves 183,000 Customers in National City, Chula Vista and Bonita (South San Diego County)

• Distribution system assets:
  – 391 miles of pipe
  – 32,592 services
  – 17 pump stations
  – 25 storage reservoirs
  – 8,202 valves
  – 2,636 fire hydrants
I.S. Strategic Plan

- Completed in 2002
- The two biggest needs:
  - An Enterprise Information Architecture at the technology level
    - Software Applications
    - Networks
    - Databases
  - An Enterprise Asset Management System
- An Enterprise Information Architecture will support systems integration and information sharing within the utility
Maximo Implementation

- Initial phase completed in 2007 – Treatment Facilities
- Distribution system facilities added in 2008
  - Assets and locations were loaded for valve and FH records
  - Routes were created
  - PM’s were created against the route
- Pumping and Storage facilities added in 2009
- Current project – Warehouse/Purchasing
Mobile GIS Technology

- In 2007, selected iWater’s infraMap software
  - GIS (ESRI) map based maintenance system
  - User friendly
  - Reporting capabilities
  - Asset Management link
  - Unidirectional flow capabilities
  - Utility Markout capabilities
  - Designed specifically for valve and fire hydrant inspection
- Panasonic Toughbook computers
GIS / Maximo Integration

- Staff and crews had one year of experience using InfraMap and Maximo
- Phase I (completed 2009)
  - Integrate InfraMap with Maximo for valve and FH maintenance (PMs, and CMs from a PM)
- Phase II (in progress)
  - Add capability to create new CM work orders directly, without a existing PM
Preparing GIS Data for InfraMap and Integration

• GIS was in shapefile format
• Converted existing shapefile data to geodatabase format (SQL Express)
• Used geodatabase design supplied by iWater (based on ESRI model)
• Converted existing maintenance data from access tables to tables in the geodatabase
• Created geometric network
Valve and Fire Hydrant Maintenance

- Includes two 2-man crews responsible for valve and fire hydrant maintenance
- 1 – 5 year maintenance cycles
- Prior to Access database, individual cards were used for each valve or fire hydrant to document various inspection or maintenance activities
Valve and Fire Hydrant Maintenance

- Began entering maintenance data into an Access database in 2000.
  - GIS staff would print paper forms based on quarter section areas
  - Crews would conduct maintenance and fill out paperwork
  - GIS or Distribution staff would enter data into Access

- Maintenance linked to GIS shapefile data based on unique FH/Valve ID
Maximo / InfraMap integration with the Maximo Enterprise Adapter (MEA) using interface tables

On creation of a new WO, MEA sends asset data to WO tables and transational data to output queue.

On 30 second polling, MEA checks for completed WOs from input queue and transfers WO and asset data.

On a sync, InfraMap will send closed WOs to the input queue and WO data table using ODBC connection.

On a sync, InfraMap will check the output queue and copy the WO data table to the Tablet, using an ODBC connection.

SQL 2000

Maximo 6.2.3

Input Queue

Work Order Data

Output Queue

InfraMap 6.1.2

Personal Geodatabase

SQL Express 2008
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Relationship of Interface Queue Table and Interface Table Records

Interface Tables

- **MXPR_IFACE**
  - TRANSID: PR RECORD (PRNUM, DESCRIPTION...)
  - 1001: PR RECORD (PR001, Test PR...)

- **MAITEM_IFACE**
  - TRANSID: ITEM RECORD (ITEMNUM, DESCRIPTION...)
  - 1002: ITEM RECORD (88000, Test Item...)
  - 2008: ITEM RECORD (T12-20, Test Item...)
  - 1054: ITEM RECORD (0565, Test Item...)

- **MXINVENTORY_IFACE**
  - TRANSID: INVENTORY RECORD (ITEMNUM, STORELOG...)
  - 1003: INVENTORY RECORD (900001, CENTRAL...)
  - 2008: INVENTORY RECORD (T12-20, CENTRAL...)

- **MXUP_IFACE**
  - TRANSID: PO RECORD (PRNUM, DESCRIPTION...)
  - 2007: PO RECORD (PO132, Test PO...)

- **MXWO_IFACE**
  - TRANSID: WORKORDER RECORD (WONUM, DESCRIPT...)
  - 1005: WORKORDER RECORD (87123, Replace...)
  - 2010: WORKORDER RECORD (87934, Repair...)

ODBC Copy of Workorder Data (Synchronize)

Mobile Tablet PC with infraMap

Synchronize changed workorder records (ODBC transfer of data)

Edit fields in the local copy of this workorder
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InfraMap Demo
Questions?