Embracing GIS:
## Denton Deploys a GIS-based Outage Management System

Trey Price, GISP
Electric Engineering Technical GIS Analyst

DENTON
MUNICIPAL ELECTRIC
Energizing tomorrow's community today!

ENGINEERING

Agenda

- About Denton & DME
- Business Need
- Design, Development & Configuration
- Integrations
- Project Challenges
- Project Successes
- Questions

Denton, Texas
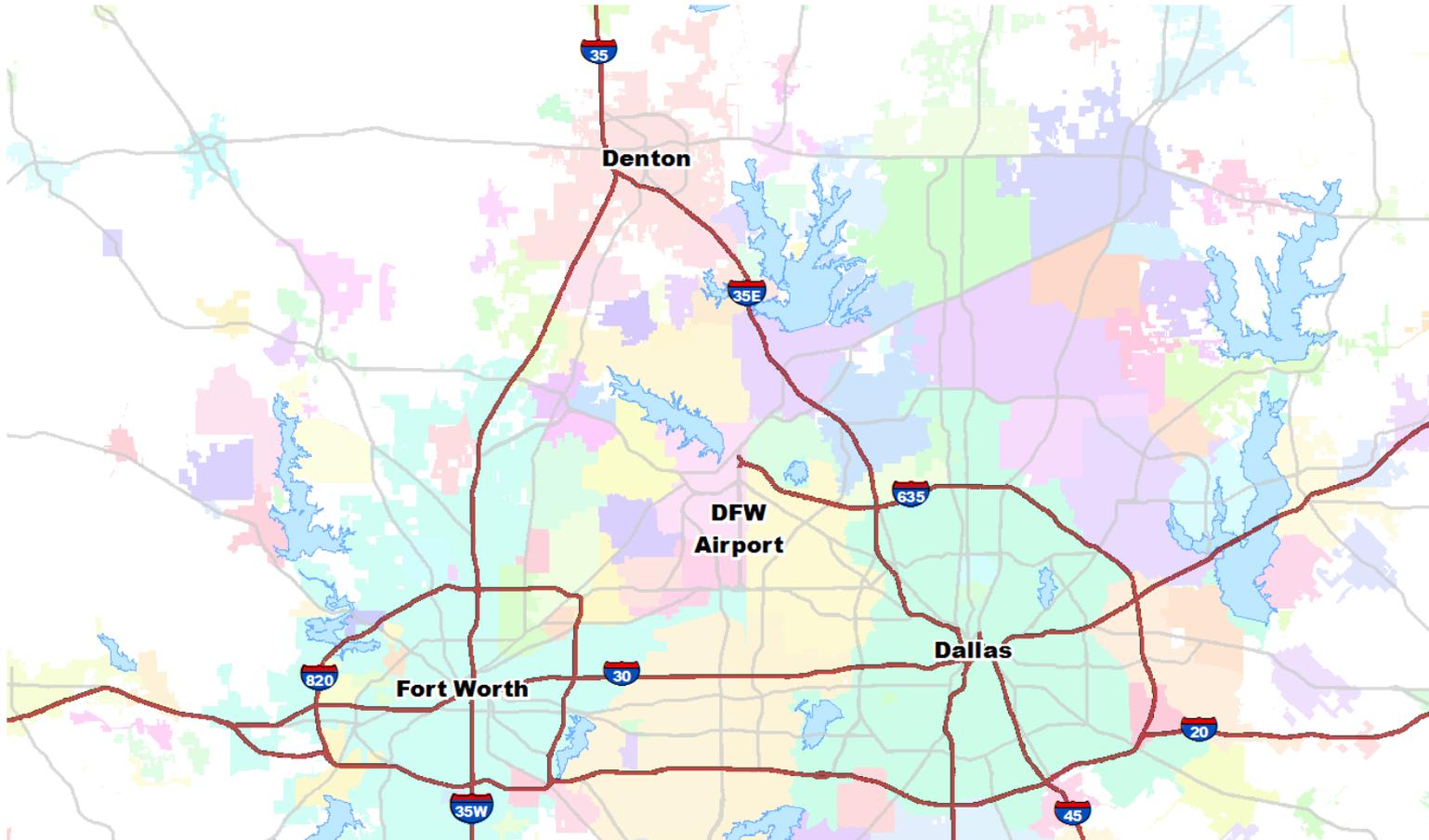
Denton, Texas

Denton, Texas

Denton, Texas

Denton, Texas

- University of North Texas
- Texas Woman's University
- Denton Arts & Jazz Festival
- 35 Denton
- Thinline Film Festival

Denton Municipal Electric

- Denton is a full service city
  - Electric (Transmission & Distribution), Water, Wastewater, Landfill & Fiber (City only)
- 50,000 Customers
- Founded in 1905
- Power Distribution:
  - 50% Gibbon Creek coal plant
  - 40% Wolf Ridge Wind Facility in Muenster, TX
  - Small percentage from landfill gas to energy project
  - Remainder through new power purchasing group
- More wind power per capita than any other city in the nation

What is an OMS?

- Outage Management System
- A way for system operators & dispatchers to track outages
- Can also track archived events
- Useful tool for utilities
- Vendors:
  ◦ Schneider Electric Responder
 ◦ Milsoft DisSpatch
  ◦ ABB
  ◦ GE, etc

ENGINEERING

Why Responder?

- Milsoft DisSPatch OMS
- Infrequent updates (roughly 2-4 weeks)
- Unreliable model
- No SCADA integration
- Frequent problems, little support
- Three maps
 ◦ OMS, Enterprise & Mobile GIS

ENGINEERING

Why Responder?

- GIS central to business
- Better functionality
- Better integrations
- Better support internally
 - Staff has experience with product

Milsoft DisSPatch OMS to..
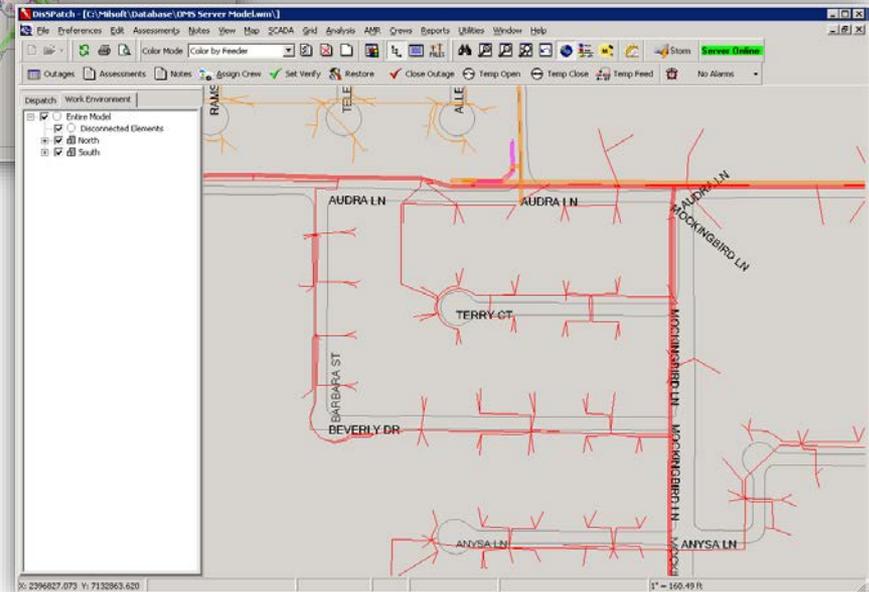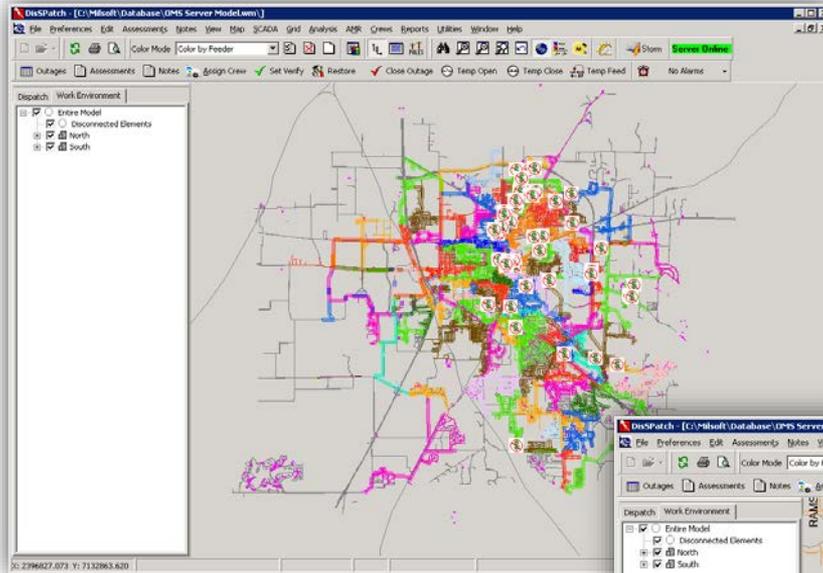
…ArcMap + Responder OMS
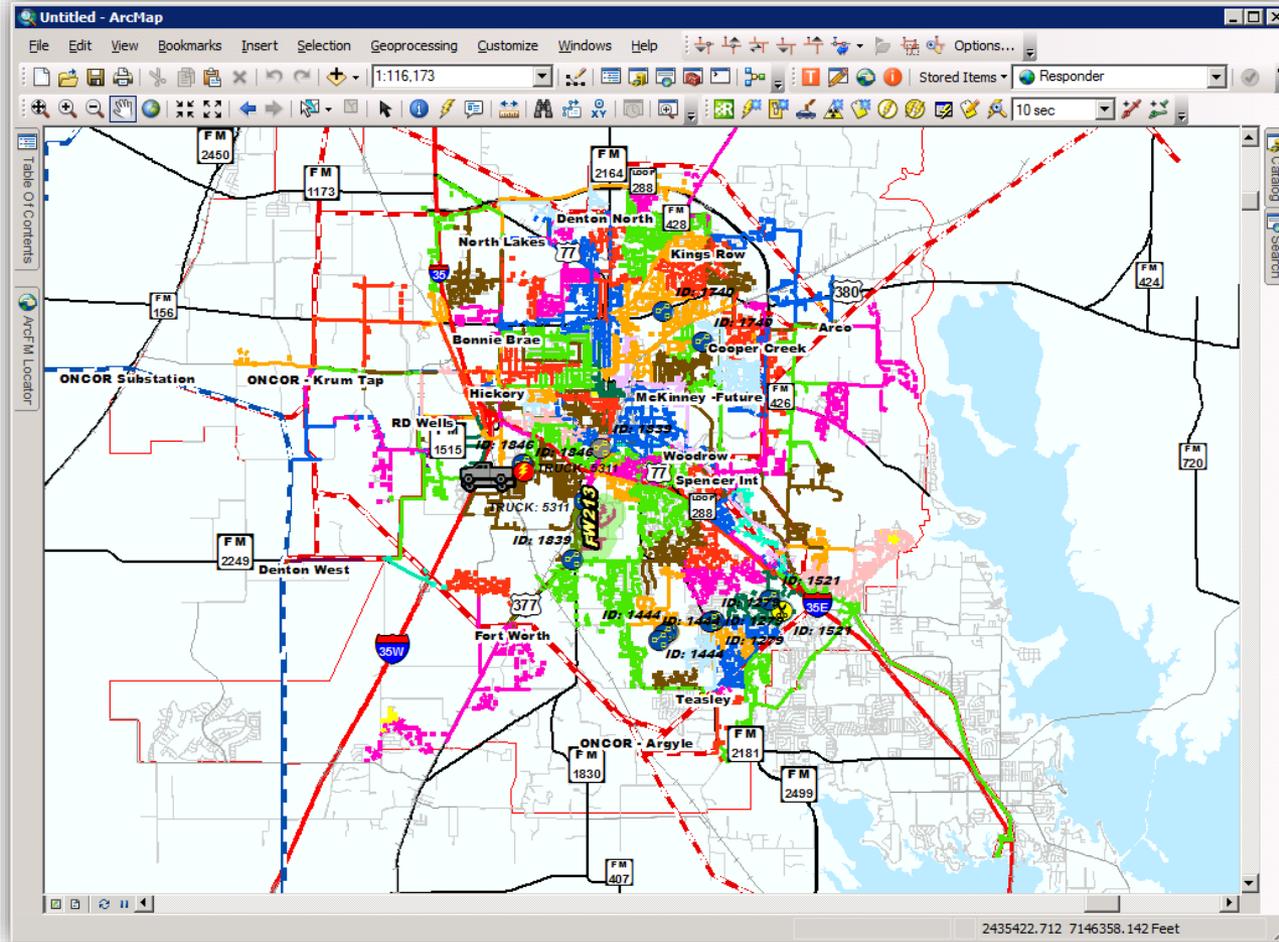
ArcMap + Responder OMS
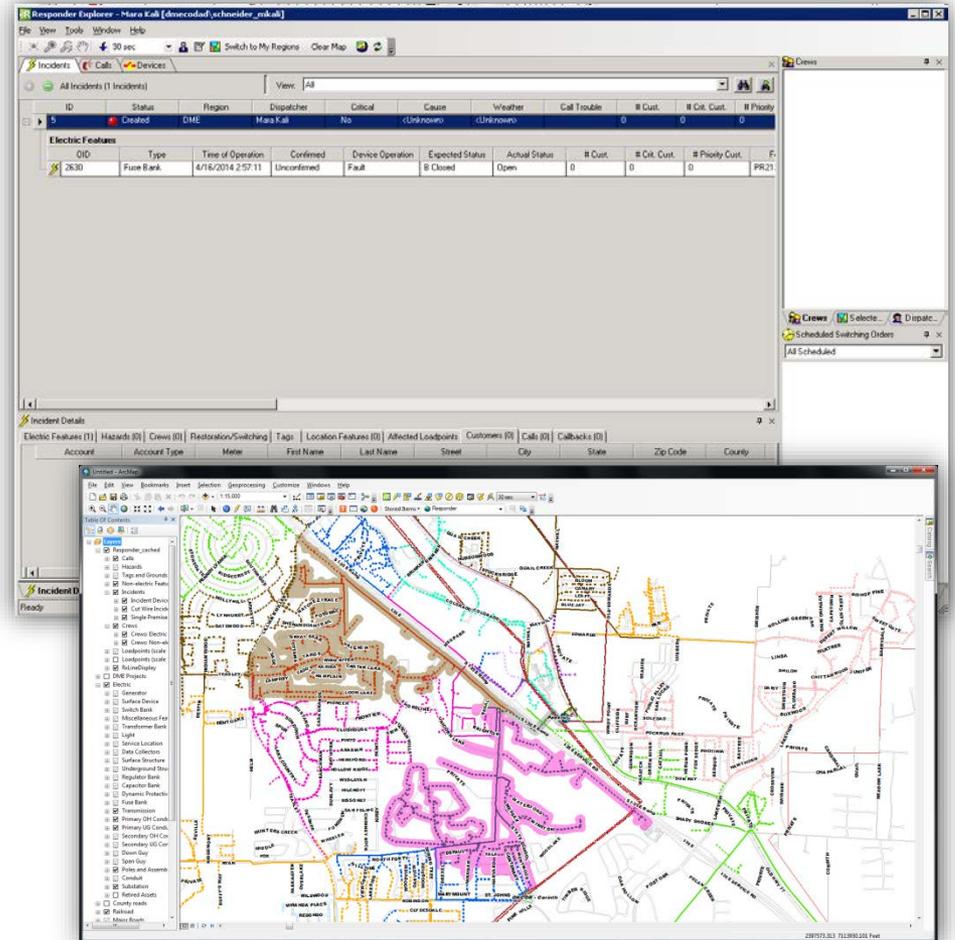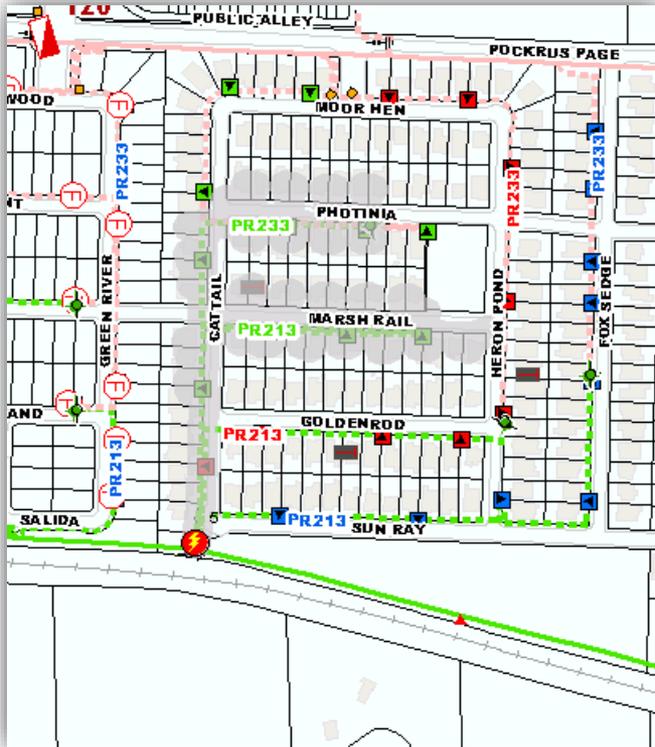
Field GIS
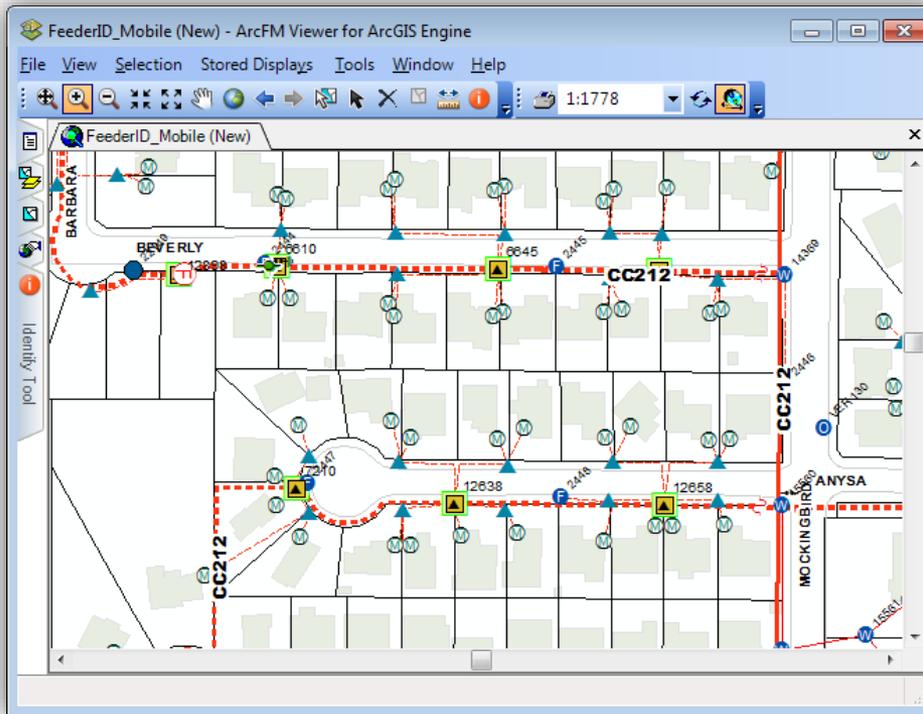
Responder OMS Implementation

- Upgrade ArcMap & ArcFM GIS to 10.1
  - September 2013
- Project Kick Off
 - October 24, 2013
- Data Review

Electric Utility Tools

- SCADA
  - Supervisory Control And Data Acquisition
- IVR
  - Interactive Voice Recognition
- CIS
  - Customer Information System
- AMI
  - Advanced Metering Infrastructure

ENGINEERING

Responder OMS Implementation

- Design
  - IVR
  - SCADA
  - CIS
  - AMI
- Integration Development
- Configuration
- Deployment

Integration Design

- Utilizing GIS Web Server
- IVR
- SCADA
- AMI (Design Only)
- CIS
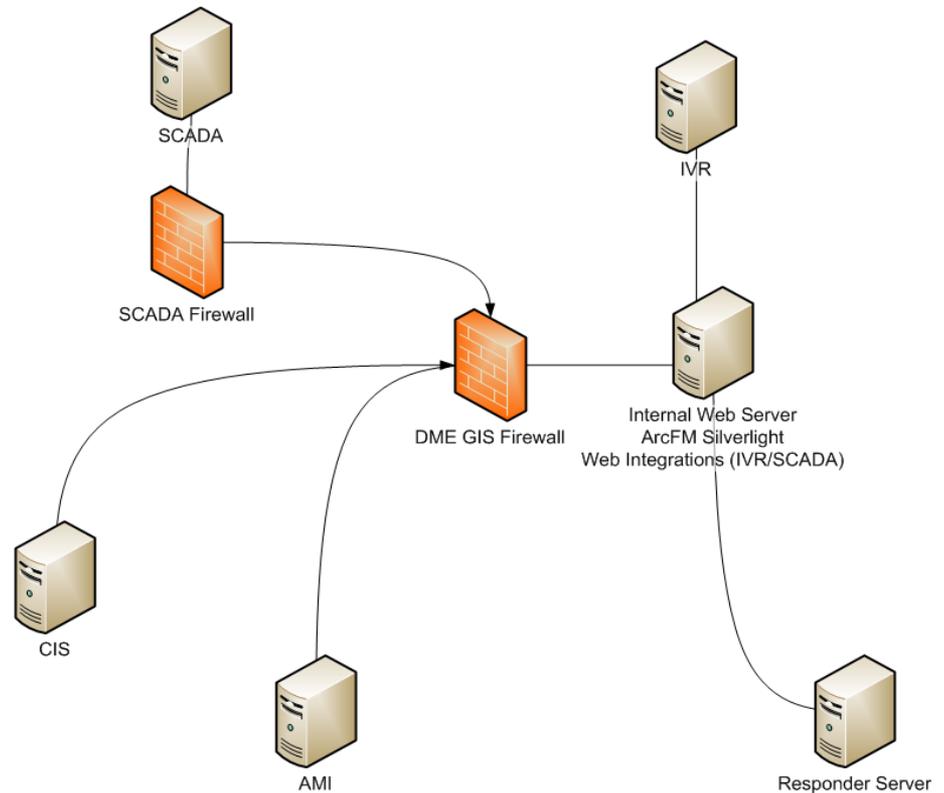
Integration Design

- ▶ **MultiSpeak used for SCADA and IVR Integration**
  - ◦ Standard that addresses needs of utilities
  - ◦ Minimized time spent developing interfaces
  - ◦ Offers true interoperability in COTS products
    - • Facilitates the adoption of new applications
    - • Enables better tech support from vendors

ENGINEERING

IVR Integration

- Milsoft PORCHE
- Multispeak 3.0AB
- Customer Calls
- Callbacks
- Revised Call Scripts
- Upgraded Hardware in 2014
  - Moved to GIS Network
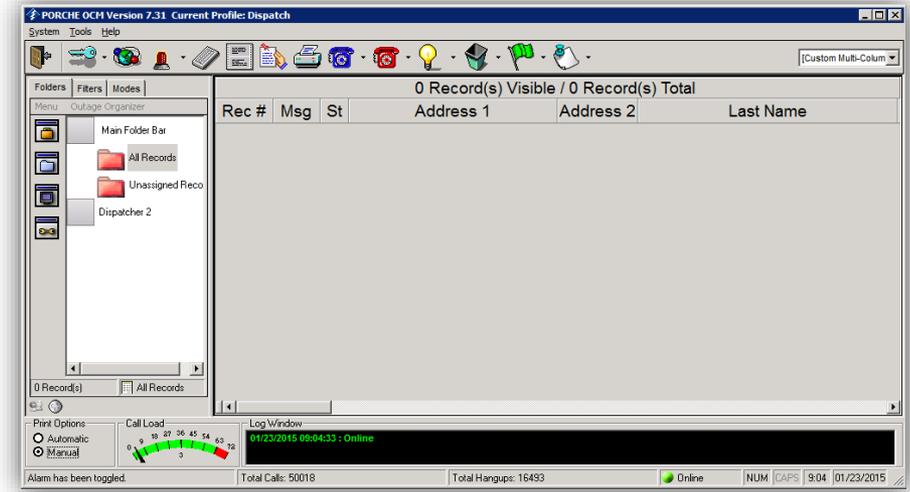
SCADA Integration

- OSI
- OSI OpenDMA Platform
- Multispeak v4.1.3
- Inbound/Outbound Verification
- 60 second threshold
  - Circuit Breaker Recloser
  - Opens/Closes 3 times to "Lock Out"

ENGINEERING

CIS Integration

- Daily .csv Export
- Single/Bulk Meters
- Location -> Account -> Meter Relationship
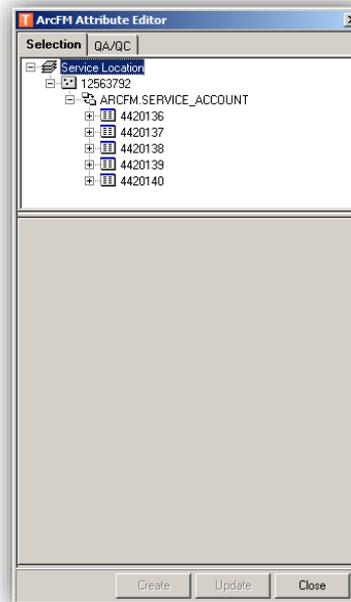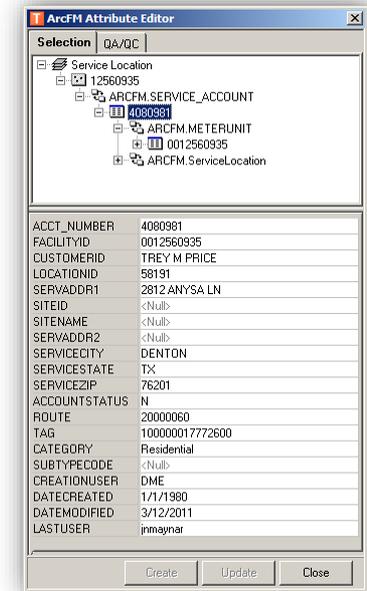
AMI Integration

- Trilliant
- Did Not Deploy
  - At development stage – 80% of meters were AMI
  - 97% now
- Multispeak v4.1.6
  - New version of Trilliant software
- Receive Power Up/Power Down
- Meter Pings
 - Yes or No?
  - vs. IVR Callbacks?

ENGINEERING

Challenges & Solutions

- Multicasting on City of Denton Network
- Two Domains: City of Denton & DME GIS
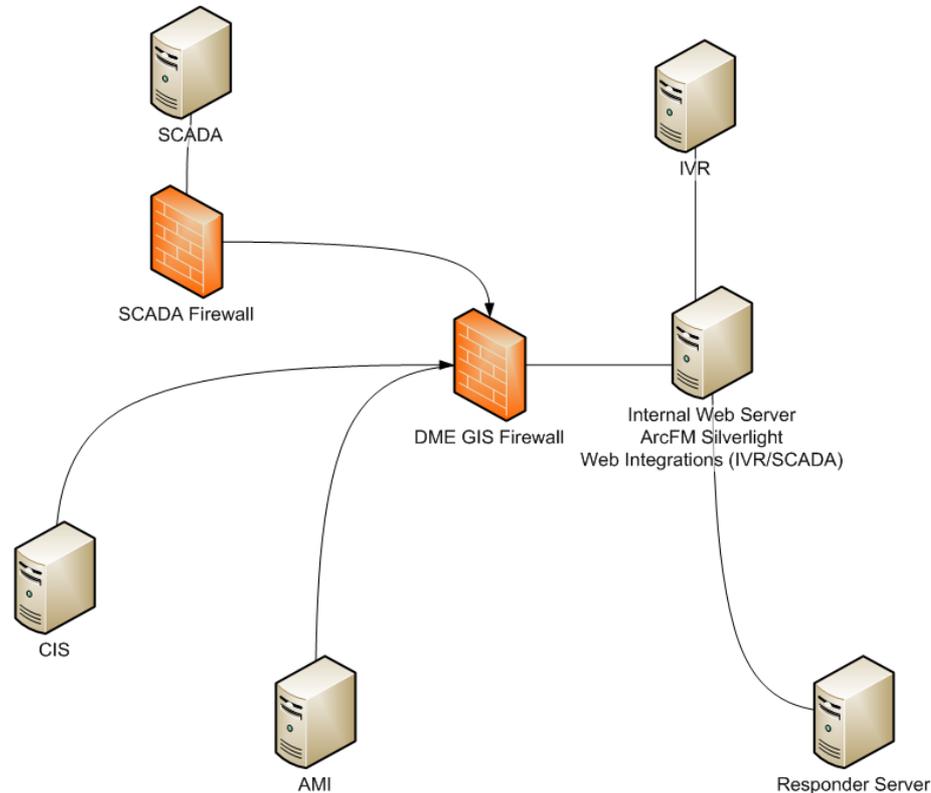
Challenges & Solutions

- Responder Clustering
  - Did not cluster
- Depending on Vendors for IVR, SCADA & AMI support
- No AMI/MDMS in-house knowledge

Challenges & Solutions

- Backup Server Rack with License Manager, Database, OMS & Domain Controller Servers
- Fiber link between DME GIS Switches
- Two network gateways, in case one failed
  - VRRP
- Two backup control center clients
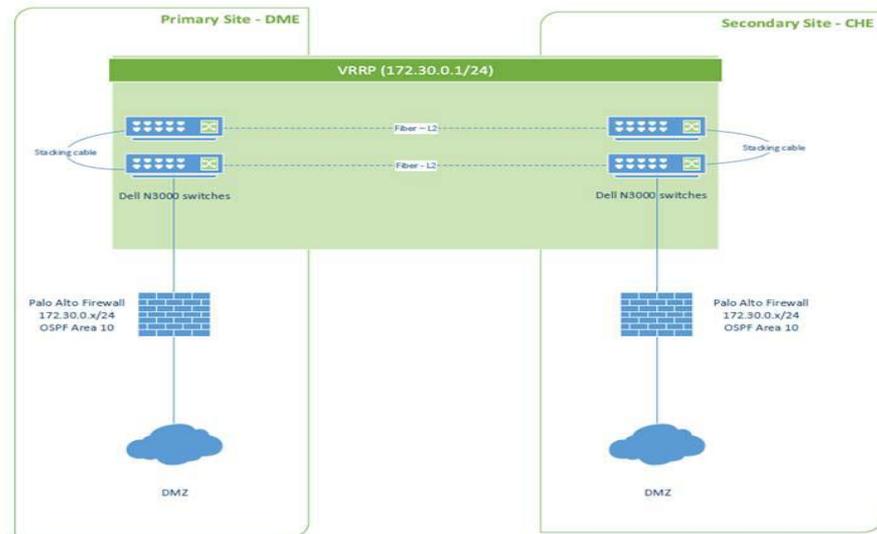
Challenges & Solutions

▸ Database Speed
  ◦ CIS Update & Compression
  ◦ Implemented several scripts to Reconcile, Compress, Analyze and Reindex database to improve performance
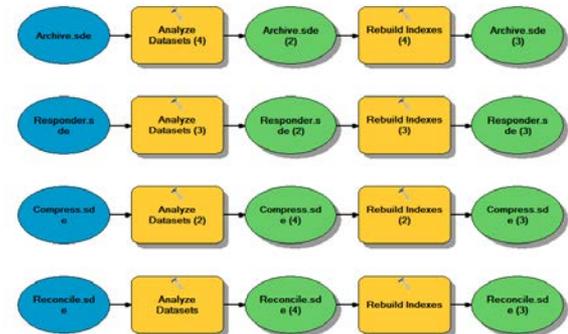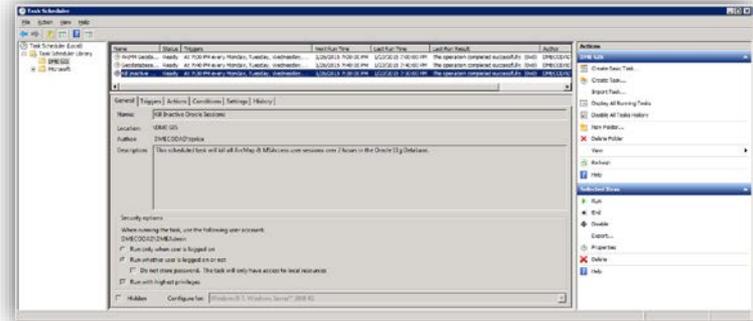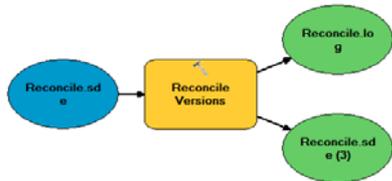
Successes

- Successful Rollout on June 24, 2014
- Began using Responder Switching Orders
  - October
- Large Monitors Placed Around Buildings
- Public Facing Outage Map

Public Facing Outage Map

- Emergency Management
- ArcGIS Online
  - XY Event Layer of RX_INCIDENT_DEVICES_VIEW
    - 10 or more customers out
  - Certification Boundaries for reference
  - http://bit.ly/1yrlx3X

ENGINEERING

Details
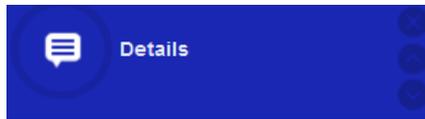
A public facing outage map that has all of Denton Municipal Electric's current system outages. Points indicate the approximate area of the outage. To preserve customer privacy, incidents with only 10 or more customers are shown. To report an outage please call 940-349-7000 and follow the instructions to log an outage.

Denton Municipal Electric Curren...

DME Outages

Current Number of Customers Out
- 10 - 49
- 50 - 99
- 100 - 499
- 500 - 999
- 1,000+

DME Certification Boundaries
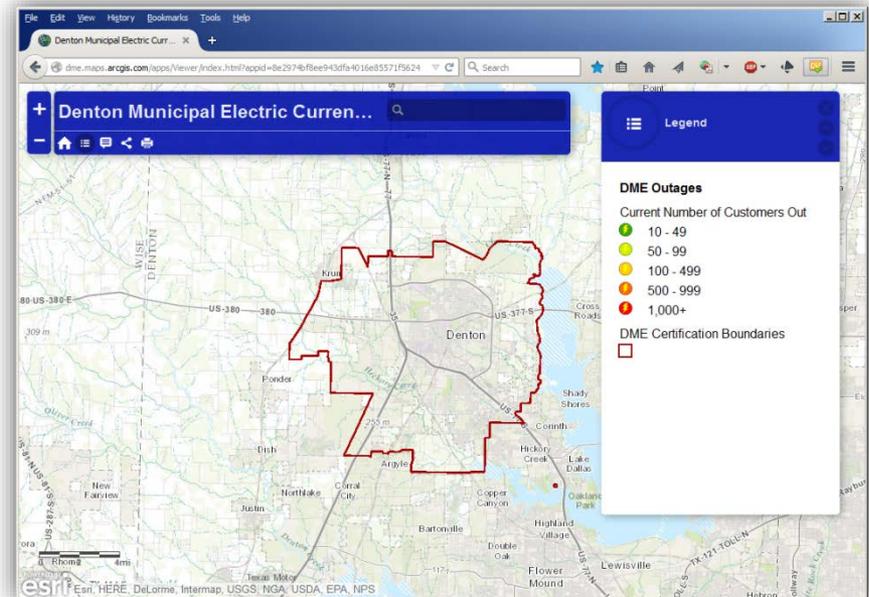
Public Facing Outage Map

- Live on Jan 7, 2015
- Local Media Attention


ENGINEERING

System Operations
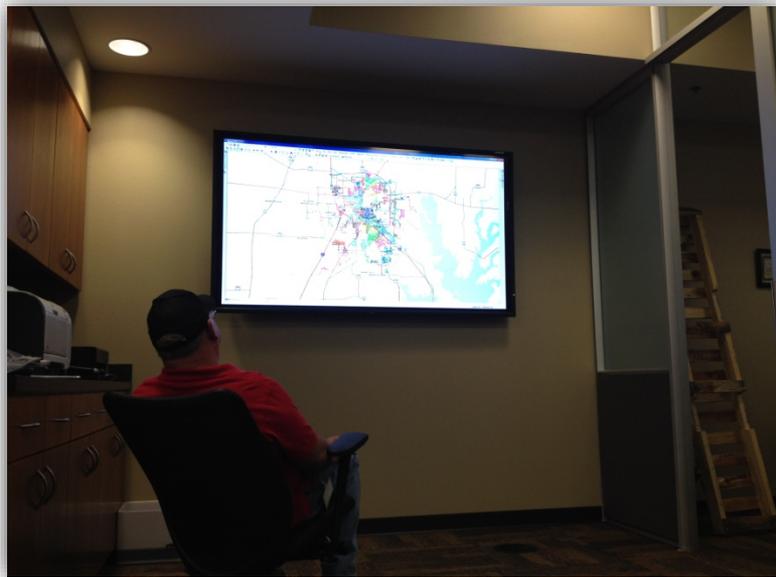
Real-time Display
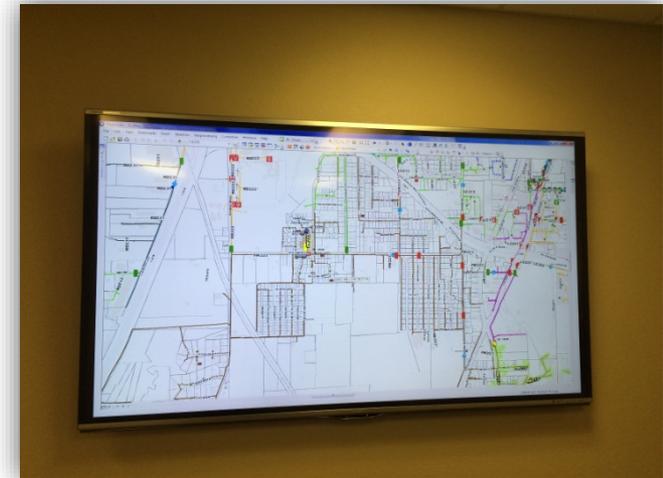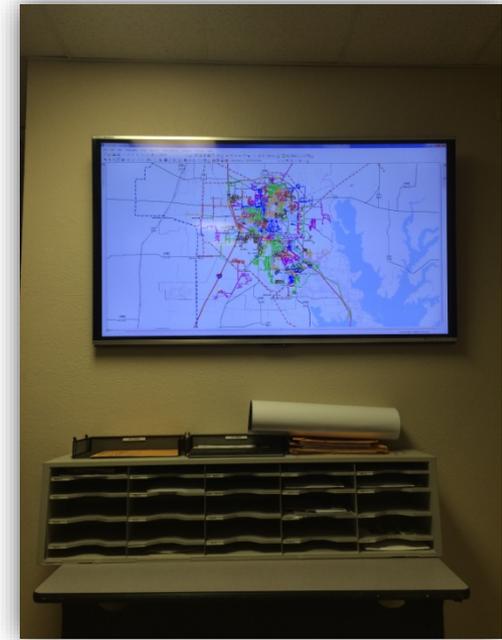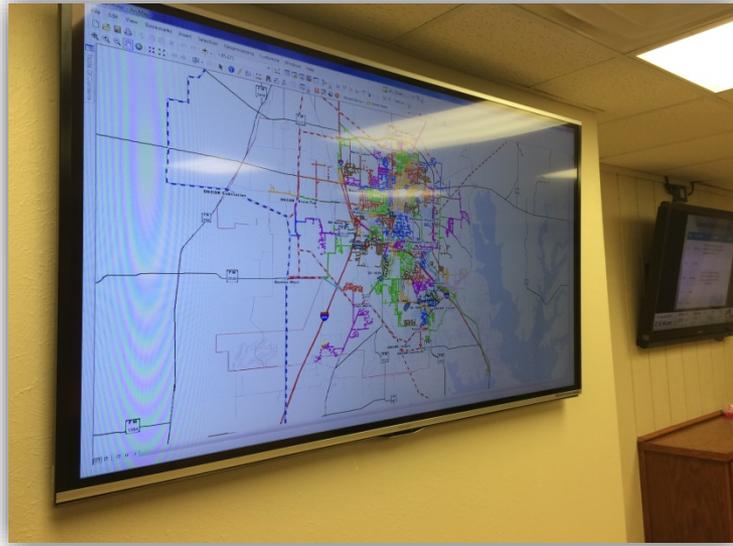
The Future

- Integrations
  - Crew Work Order Ticketing
  - AMI
- Interactive Outage Map
  - Outage Report Form
  - Texting/Email Outages
  - Better Customer Interaction
- Transmission Data

ENGINEERING

The Future
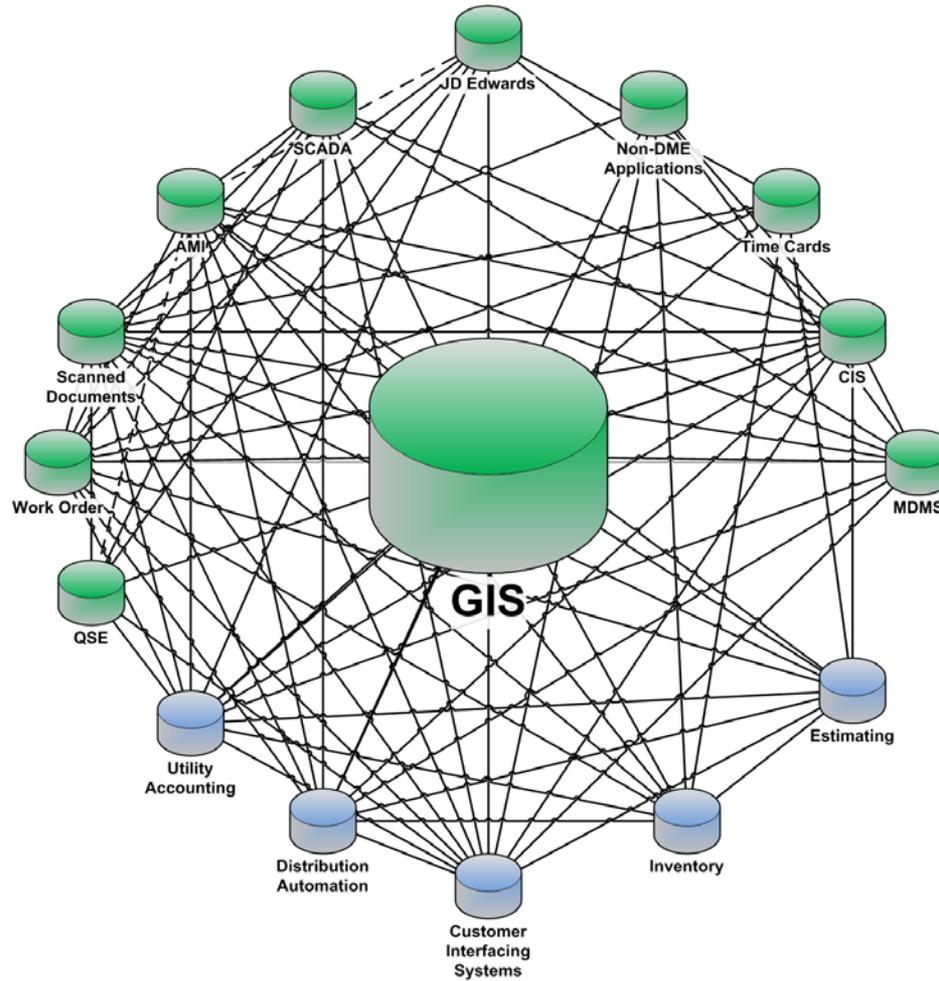
Questions?

- ESRI UC (July 20 – 24, 2015), San Diego, CA

- Thursday July 23 at 10:15 AM in Room 29C

ENGINEERING