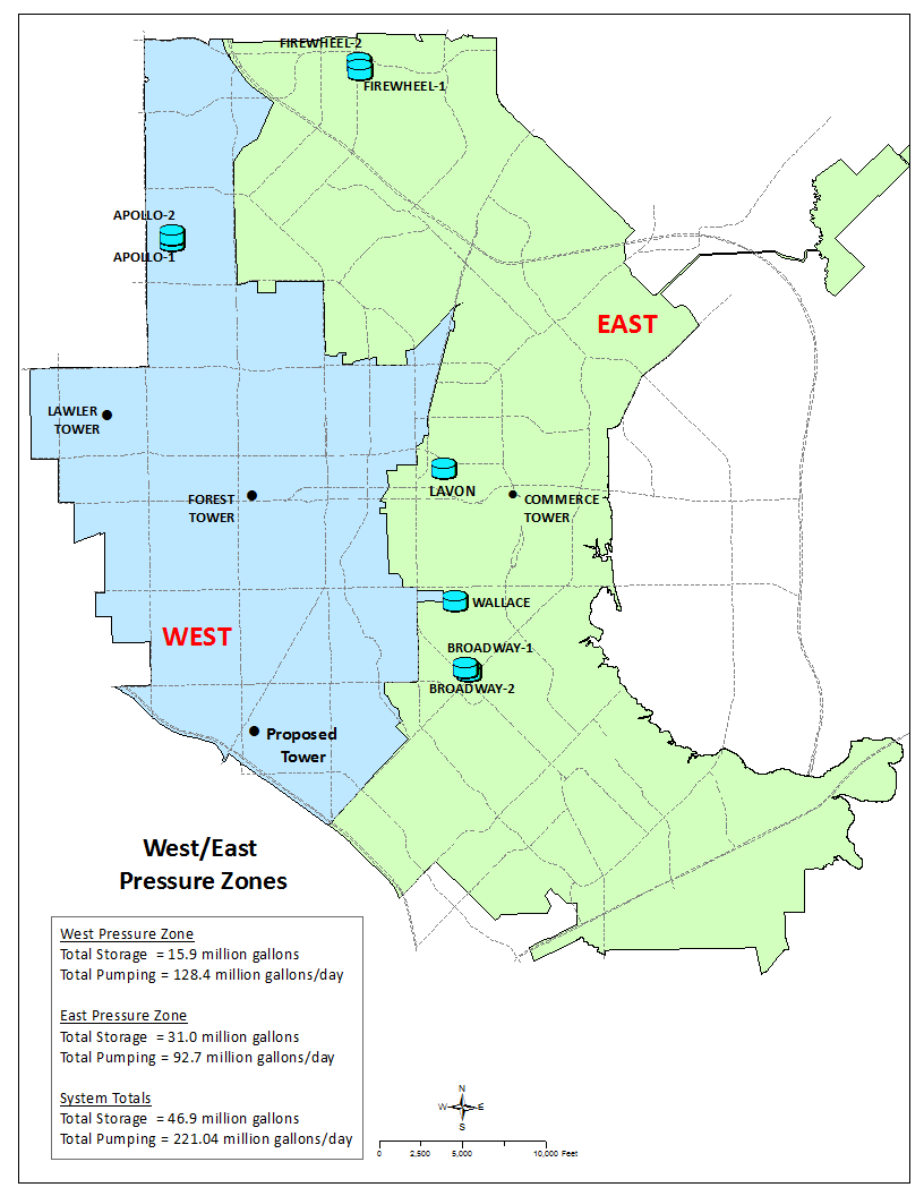
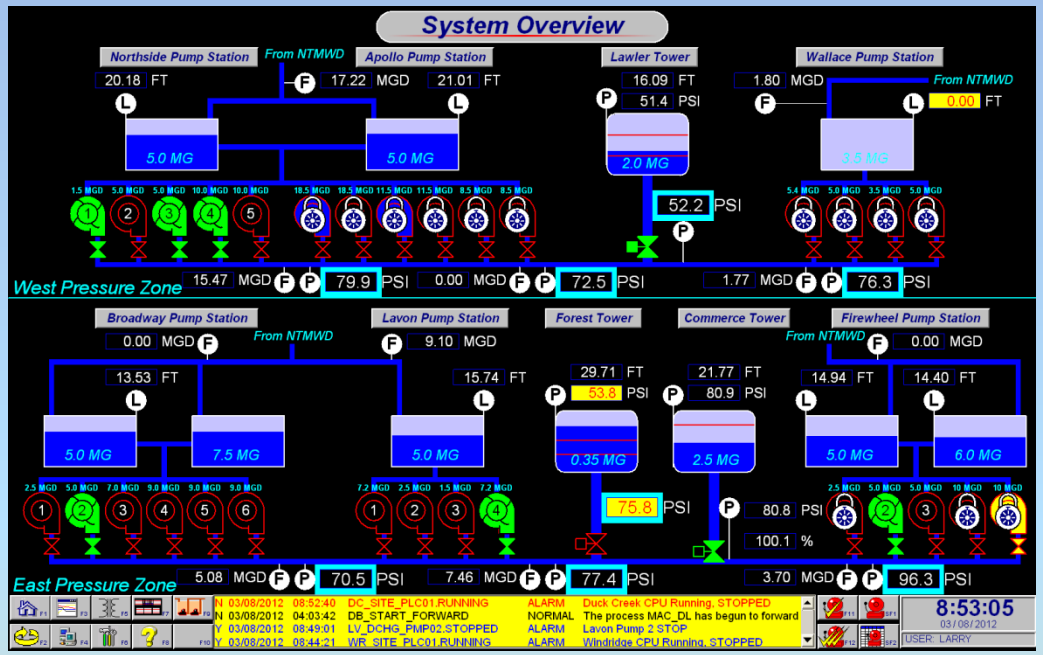

The Strongest Link
Integrating SCADA & GIS
GARLAND
WATER UTILITIES

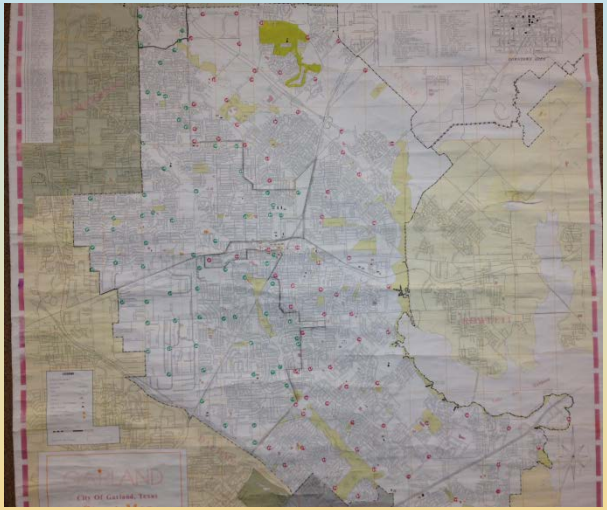
System Numbers

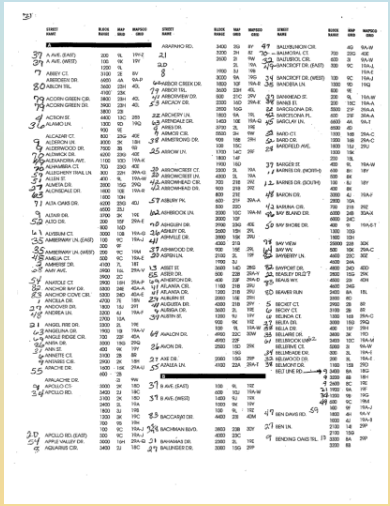


- 226,876 Population
- 86,593 water connections (TCEQ)
- 1,114 miles of water mains, ranging in size from ¾” to 48”
- 8,271 fire hydrants
- 70% of the mains are cast iron
- West zone has 3 pump stations and 2 towers
- East zone has 3 pump stations and 1 tower

Business Need

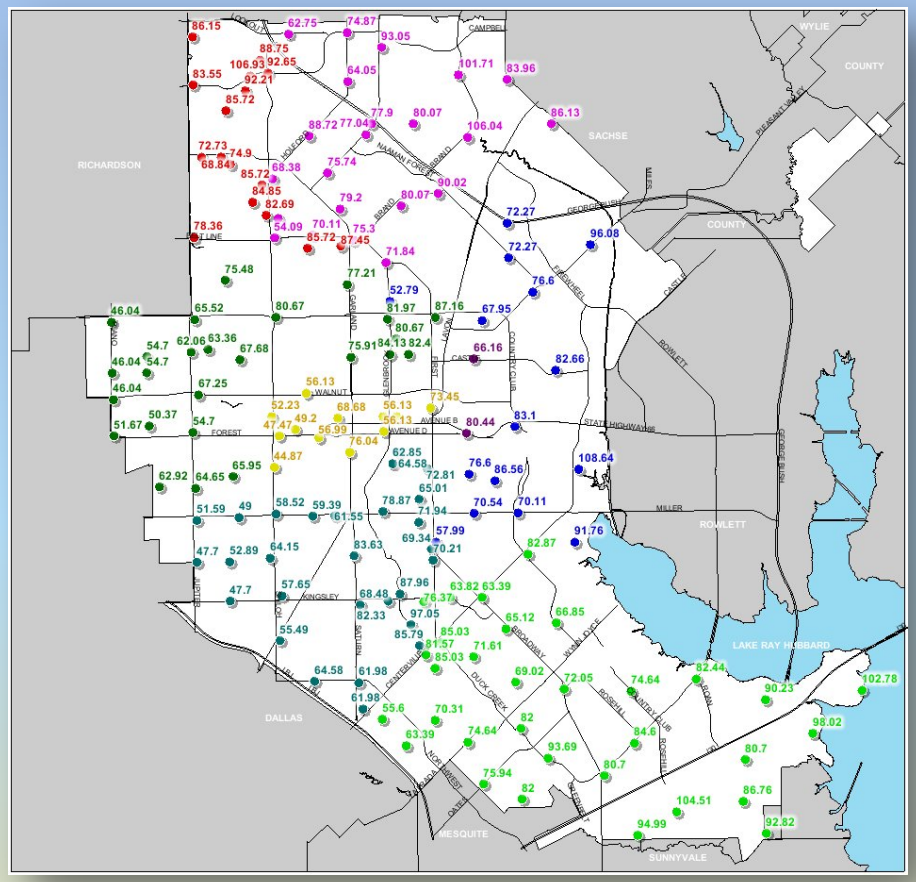






- System operators had limited system visibility – pumping stations and elevated storage only
- Operators relied on low pressure / main break calls
- Outdate paper maps showing estimate pressure points
- We needed a NEW, more accurate and proactive approach

Pressure Equation Development



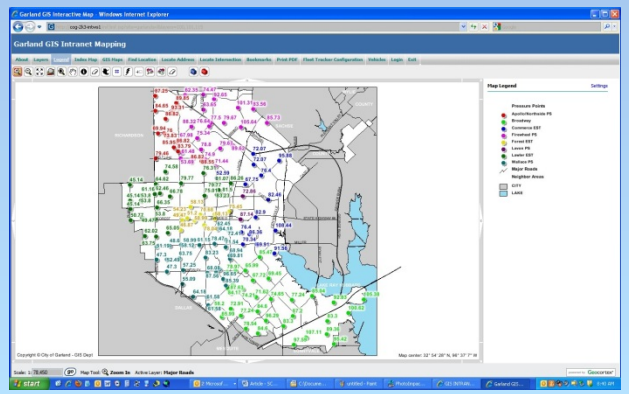
- 152 EPP (Estimated Pressure Points) locations were selected: 71 points in the East and 81 points in the West pressure plane and imported into ArcSDE
- System Average and Maximum demand day models were used to determine the facility of greatest for each point
- Ground contours were used to assign elevation for each point
- EPP equation was developed for each point and tested against hydraulic model
- Coefficient added to account for head loss based on model hydraulic grade lines
- EPP color-coded by the facility of greatest influence

FREESE AND NICHOLS

SCADA to GIS Integration

WATER STATIONS

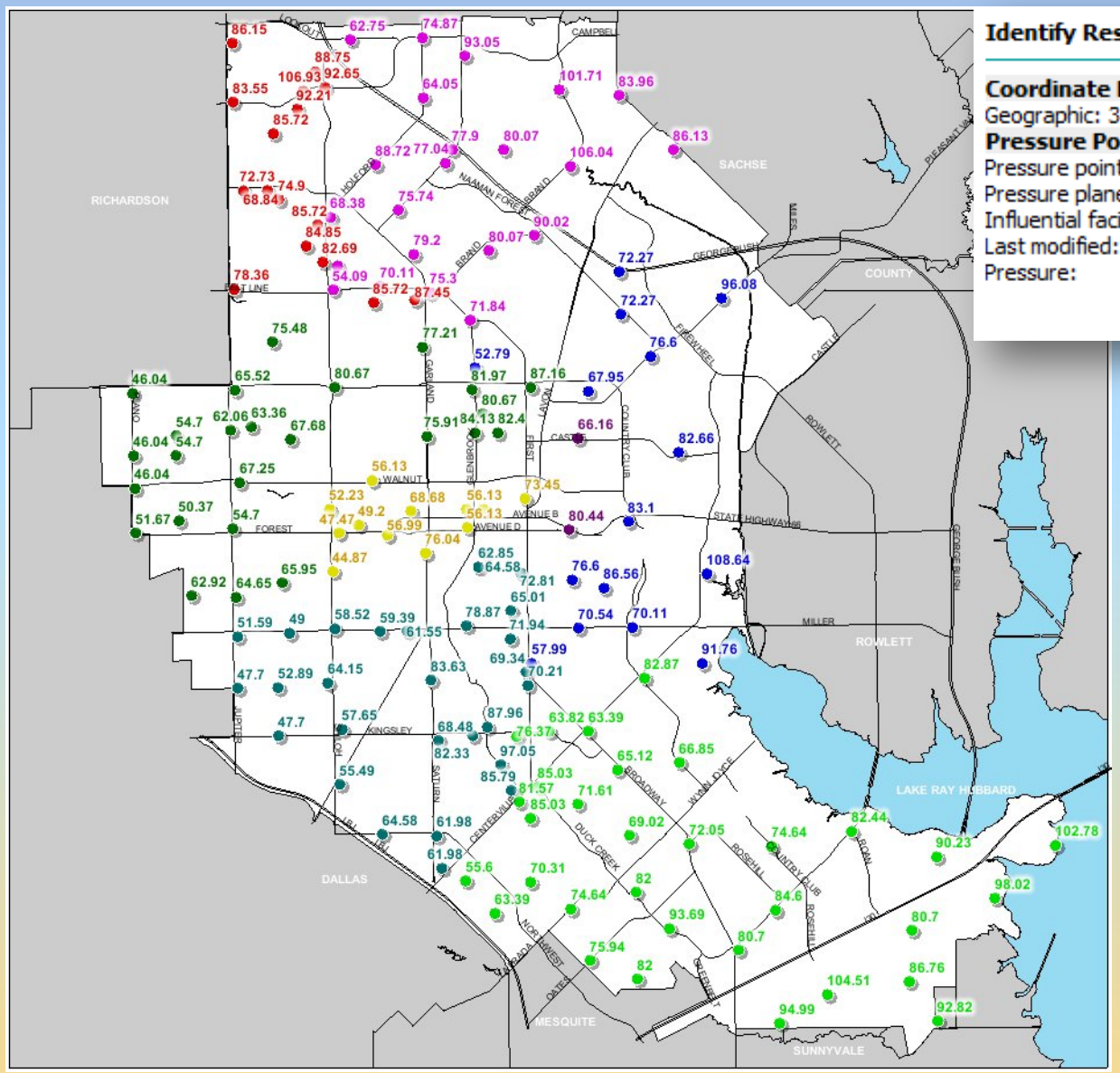
SCADA



WMS

GIS

Results



Identify Results

Coordinate Position

Geographic: 32° 57' 57" N, 96° 38' 0" W

Pressure Points

Pressure point ID: 40
Pressure plane: E
Influential facility: Firewheel PS
Last modified: 2013-05-06 08:39:00
Pressure: 79.47

Map Legend

Pressure Points
- Apollo/Northside PS
- Broadway
- Commerce EST
- Firewheel PS
- Forest EST
- Lavon PS
- Lawler EST
- Wallace PS

Major Roads

Neighbor Areas

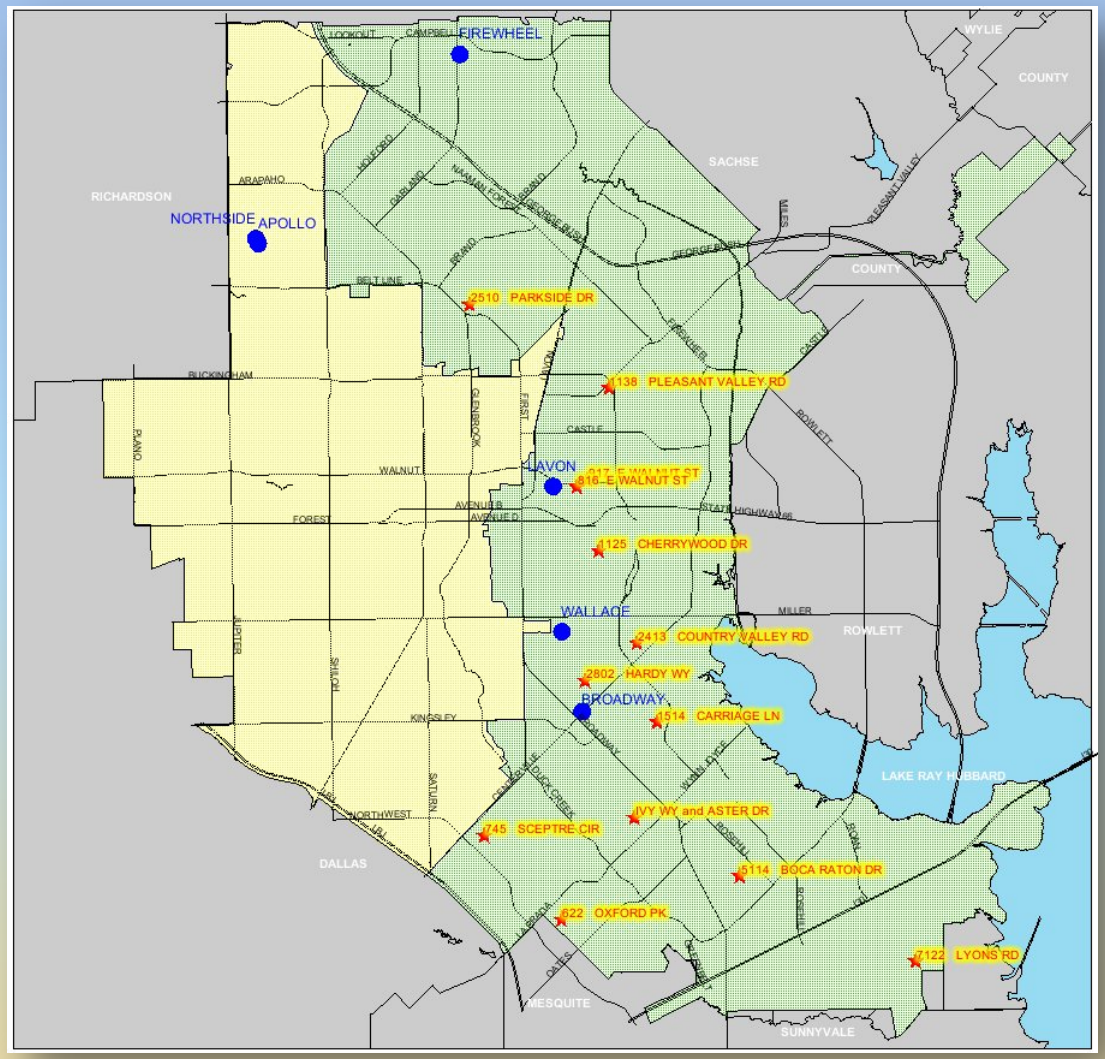
CITY

LAKE

Results

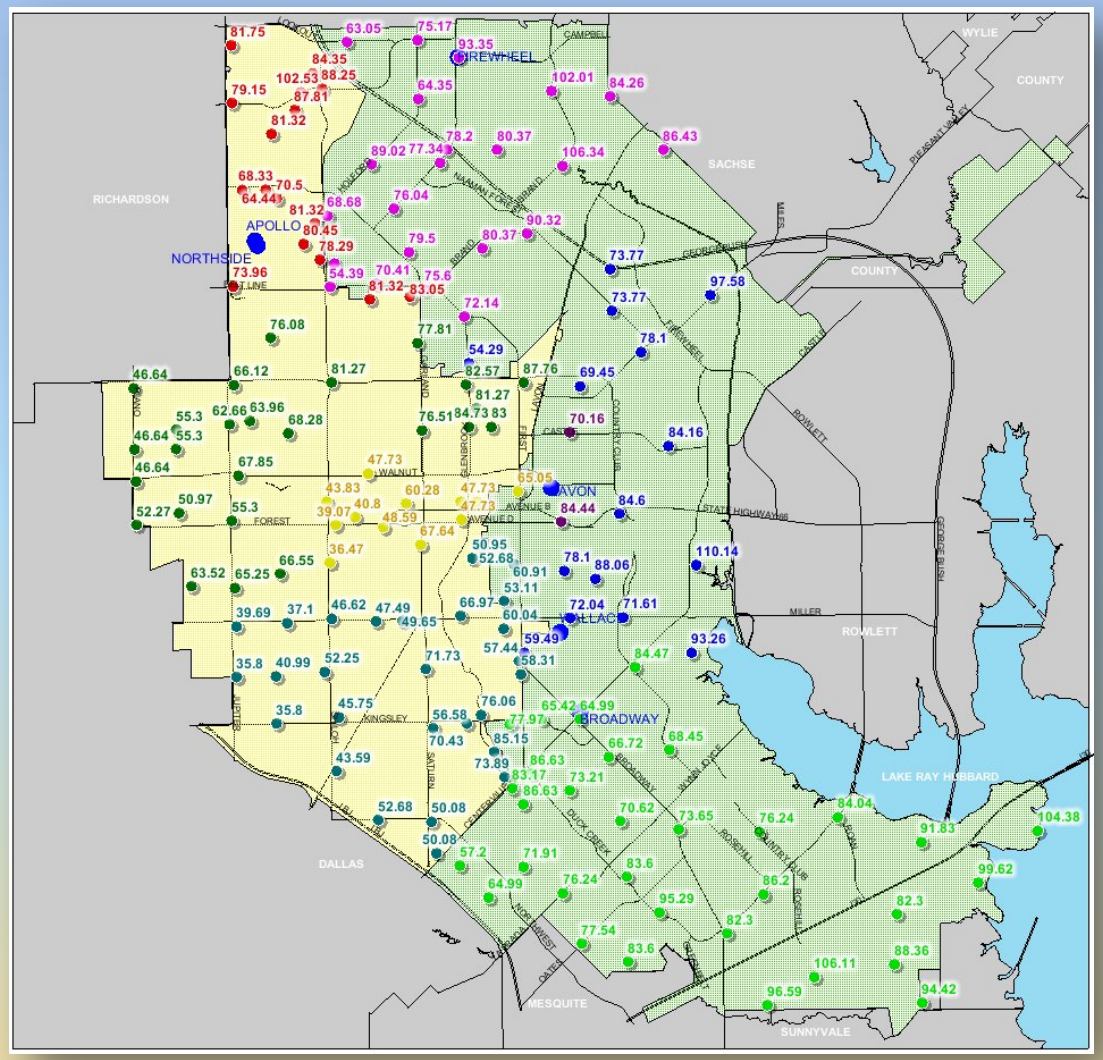
- System operators have better visibility of pressure estimates throughout the entire distribution system
- Higher elevation vs. lower elevation customers
- More educated “pump run” decisions
- Better use of water towers (elevated storage)
- Outdate operating procedures out, more efficient operating procedures in place
- EPP is very accurate
- In house maintenance

Real World Application – Firewheel PS



- January 2012 station shut down: lack of visibility and communication issues caused several low pressure calls and 14 main breaks
- All available crews re-directed to MB calls (40 employees)
- $12,201 cost

Real World Application – Firewheel PS

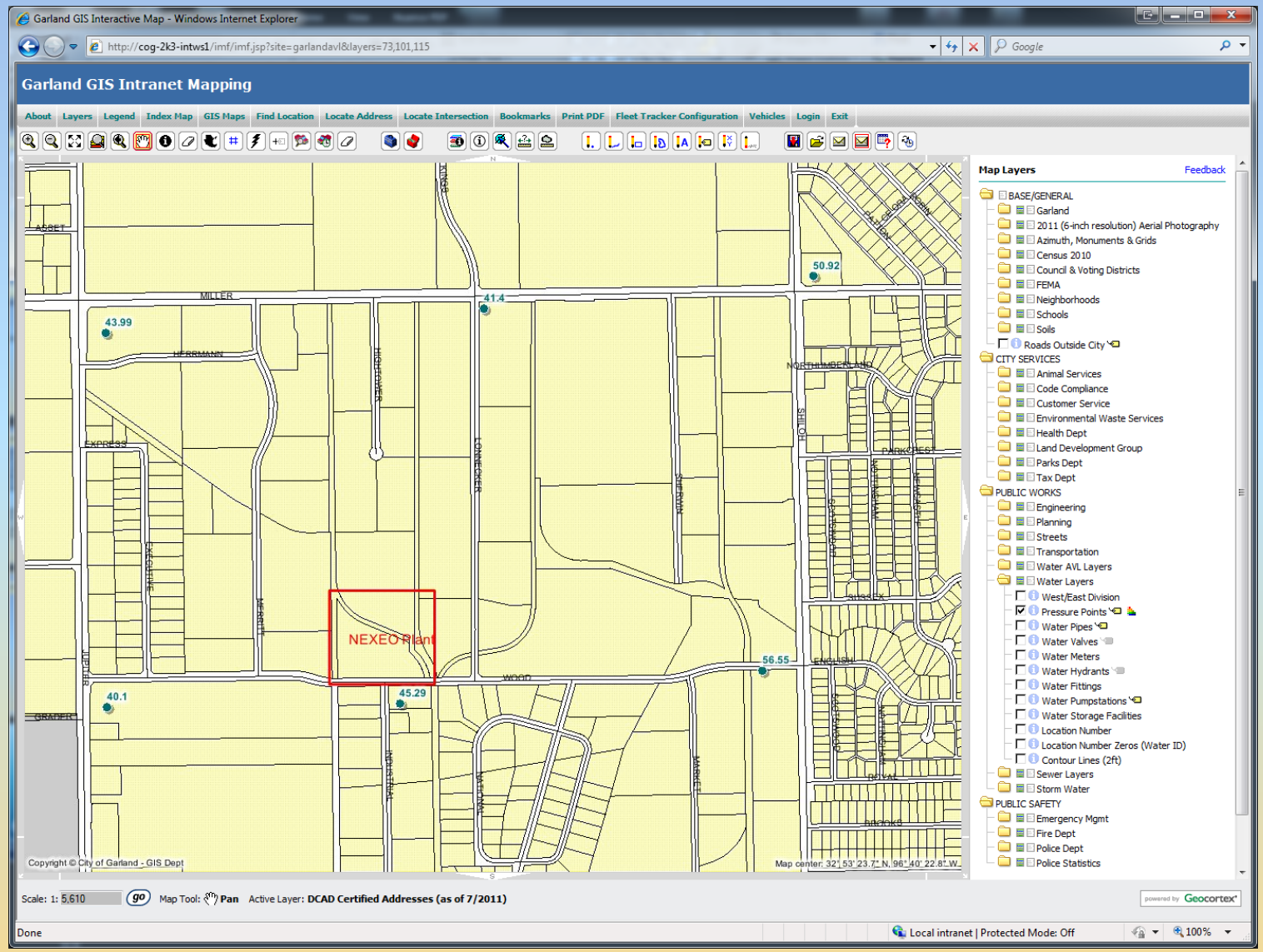


- January 2013 station shut down
- Better system visibility
- Better SOP
- No main breaks
- No low pressure calls

Real World Application – NEXEO Plant fire

- November 16, 2012 around 3:30 PM
- 10,000 gallons of methanol on fire
- Initial area pressure: 45 PSI, increased to 78 PSI

Real World Application – NEXEO Plant fire



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