Conversion of Lincoln Water CAD to ArcGIS – Lessons Learned

Presented by

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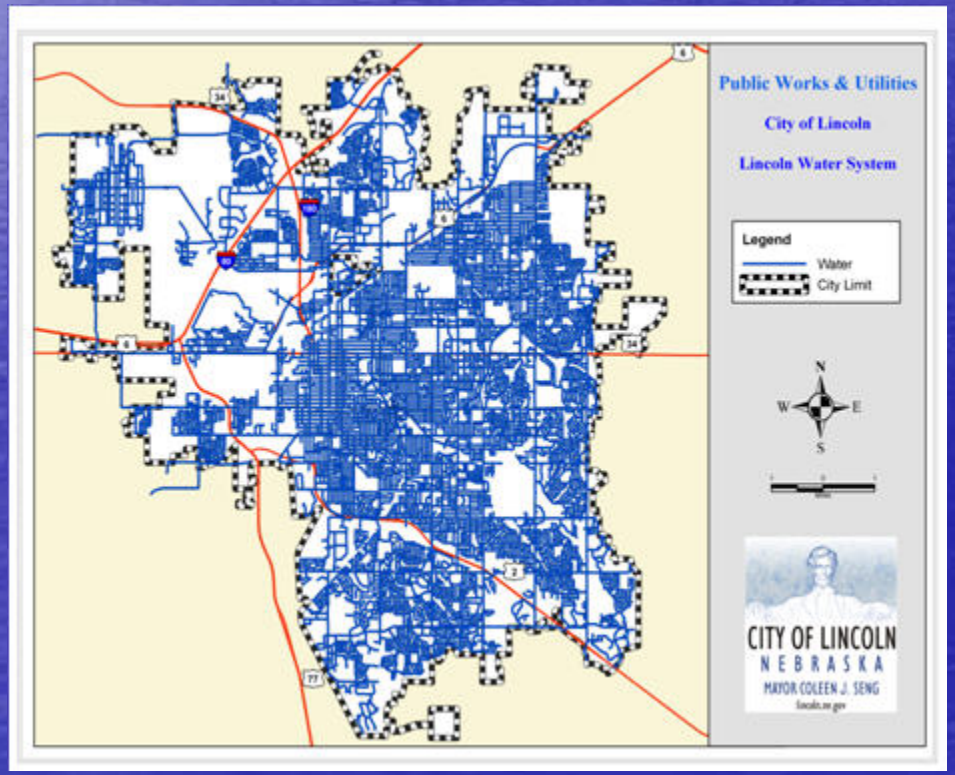
Statistics of the Water System

- Over 1200 Miles of Water Main, serving over 240,000 people
- Average Distribution System Growth of 2.4% per year
- 488 miles of main added between 1975 – 2008
- 60% of System built prior to 1974. Mains built in 1888 are still in service!



Reasons for Converting from CAD to GIS

- Needed an Asset Inventory for Condition Assessments
- Facility Master Plan Recommendation in 2002
- Share Data with other City/County Departments
- Increase ability to interact with GIS Community
- Meet Strategic Plan Goals
- Transition from Paper Based to eTechnology
- Improve Productivity, Reduce Costs and move to Mobile Field Devices

Evaluated Existing Procedures

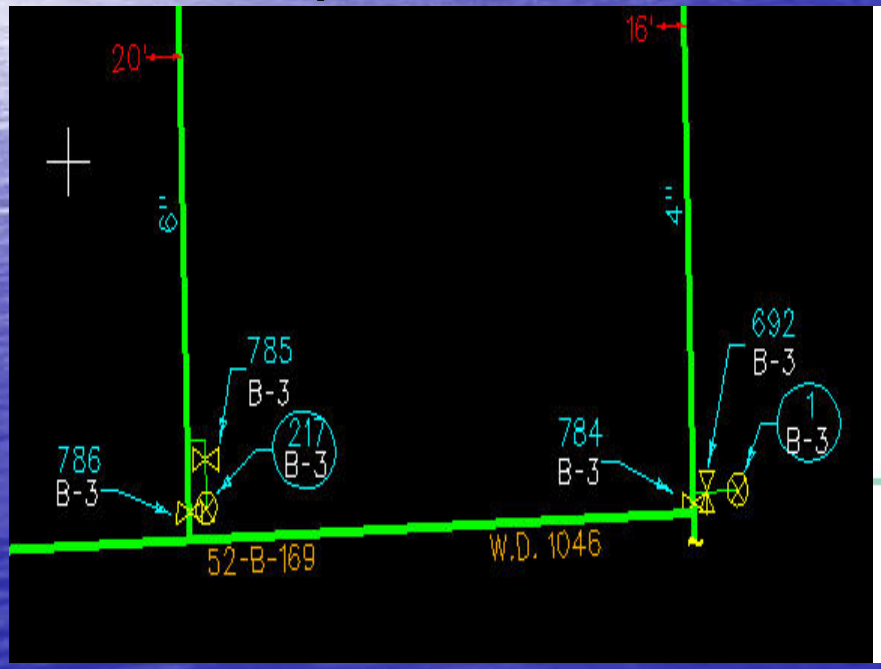
- Staff Interviews & Procedure Flowcharts
- Water Records & Asset Management
- System Maintenance & Construction
- “One Call” Utility Location System
- CIP & Replacement Project Management
- Regulatory & Quality Sample Locations
- Distribution System Performance Metrics

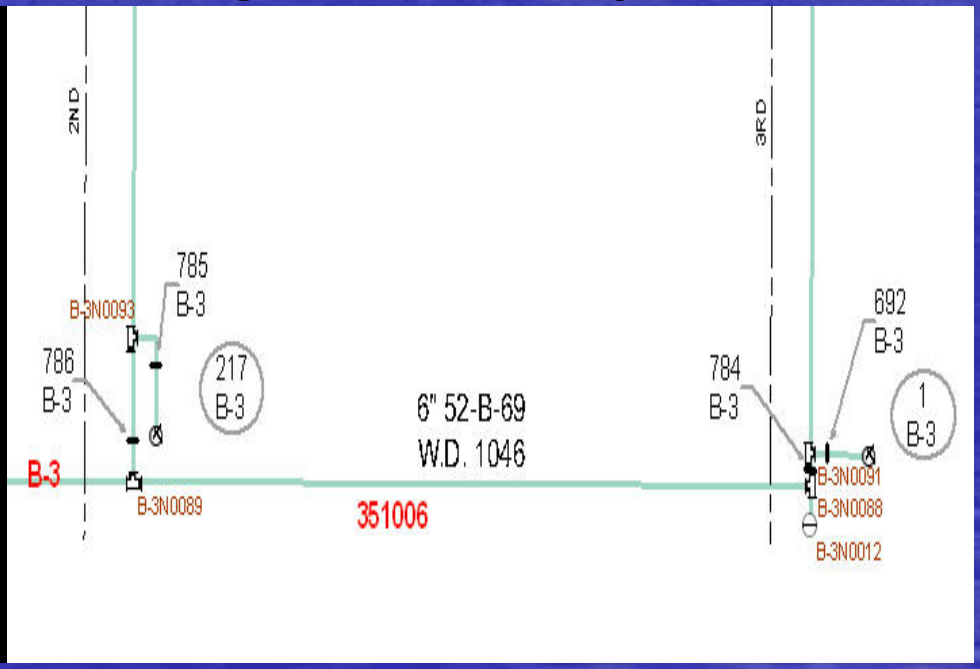
Questions to Ask when Performing Preliminary GIS Design

- Water Utility Data Model Templates
- Contact other Utilities to learn from them
- Beware of Non-Upgradeable Customization
- Examine your Current Workflow –
  - Who enters the Data?
  - Who is responsible for Coordinating Changes?
  - What improvements would staff like to see?
- Investigate the desired synergy between your GIS and your Asset/Work Order Management System.

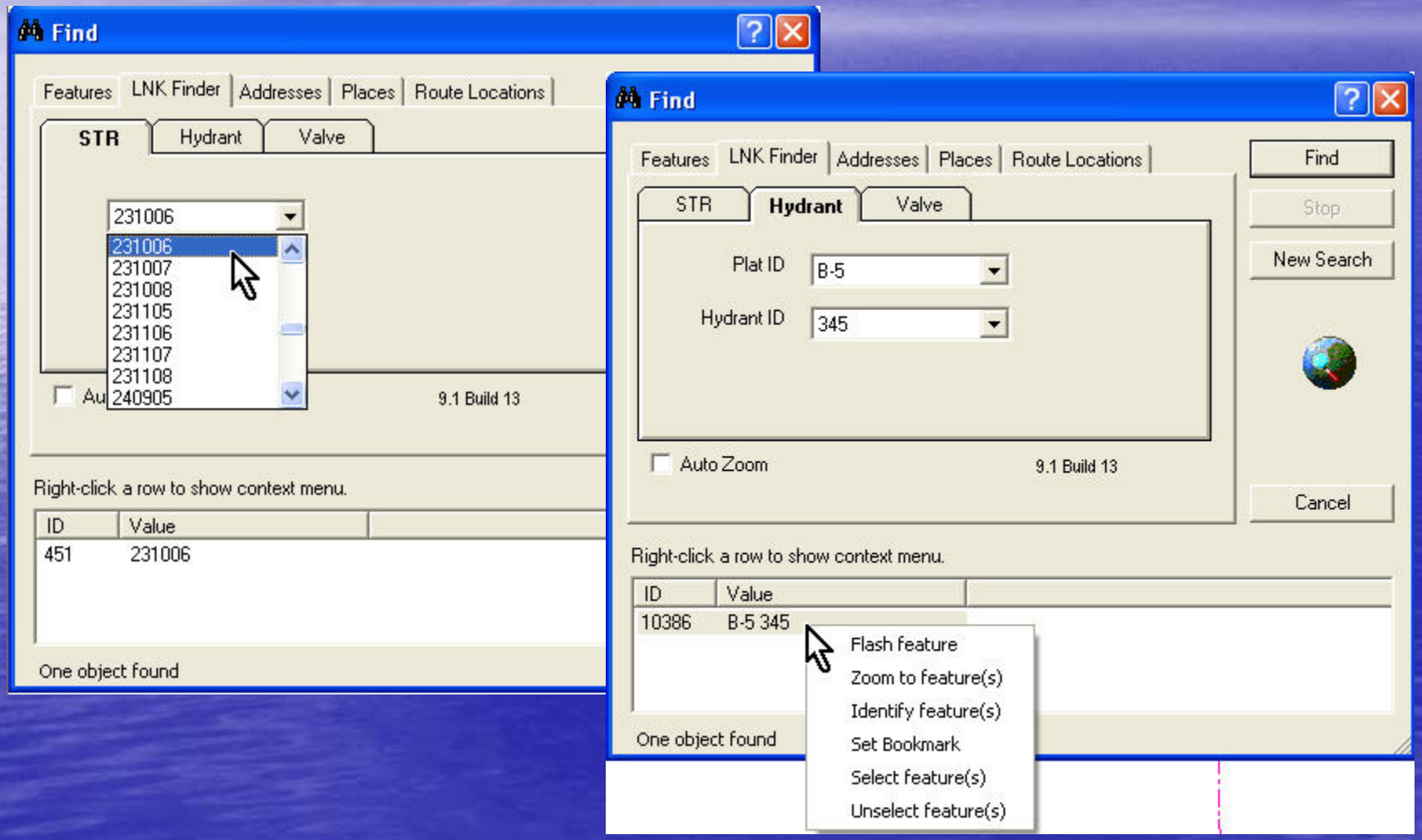
Contract to Convert Digital Data to ArcGIS – Aug. 2004 to Dec. 2005

- Determined that Fittings representing Tees, Crosses, Reducers, etc. needed to be incorporated in the GIS and given a unique ID.

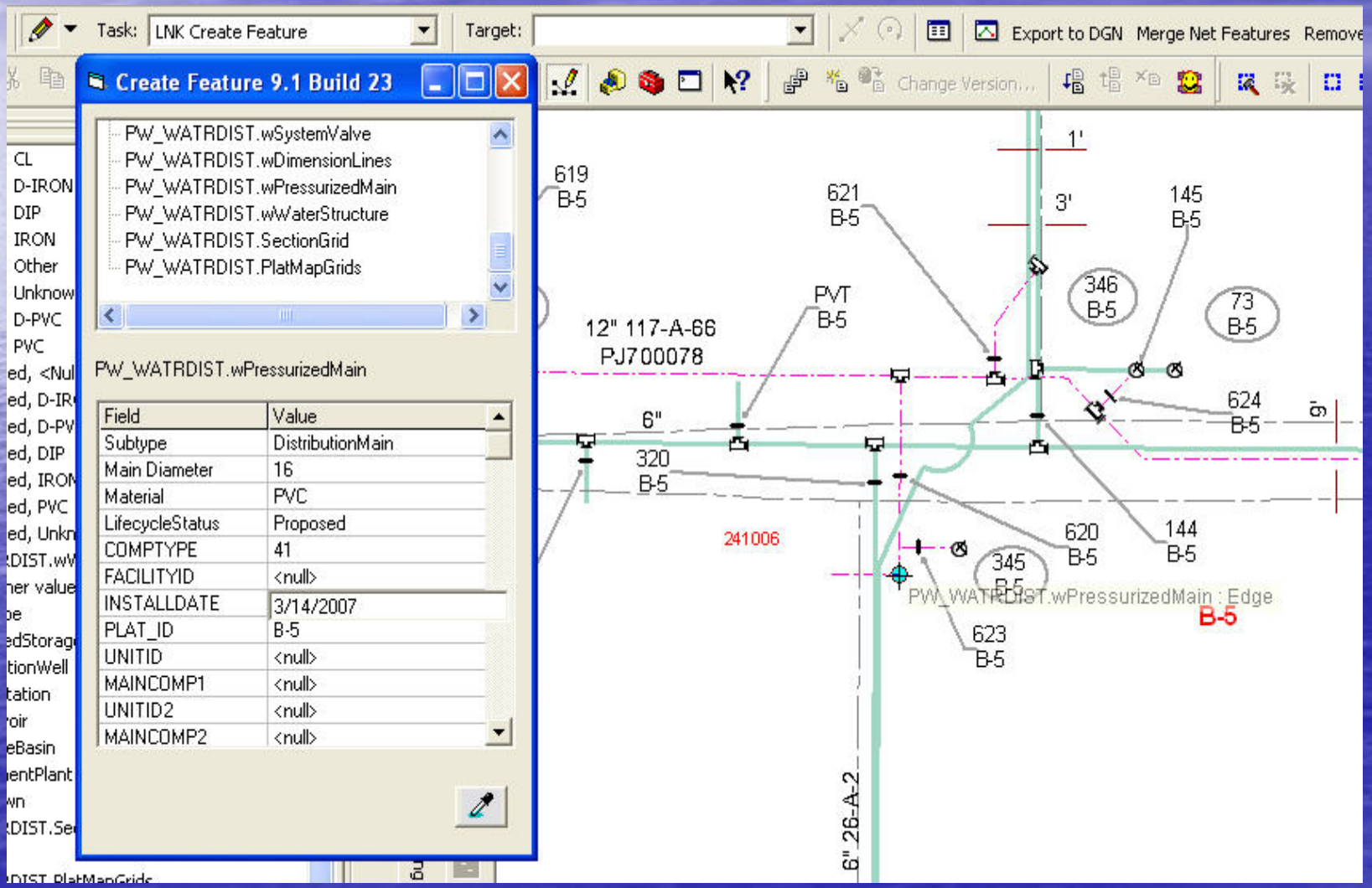




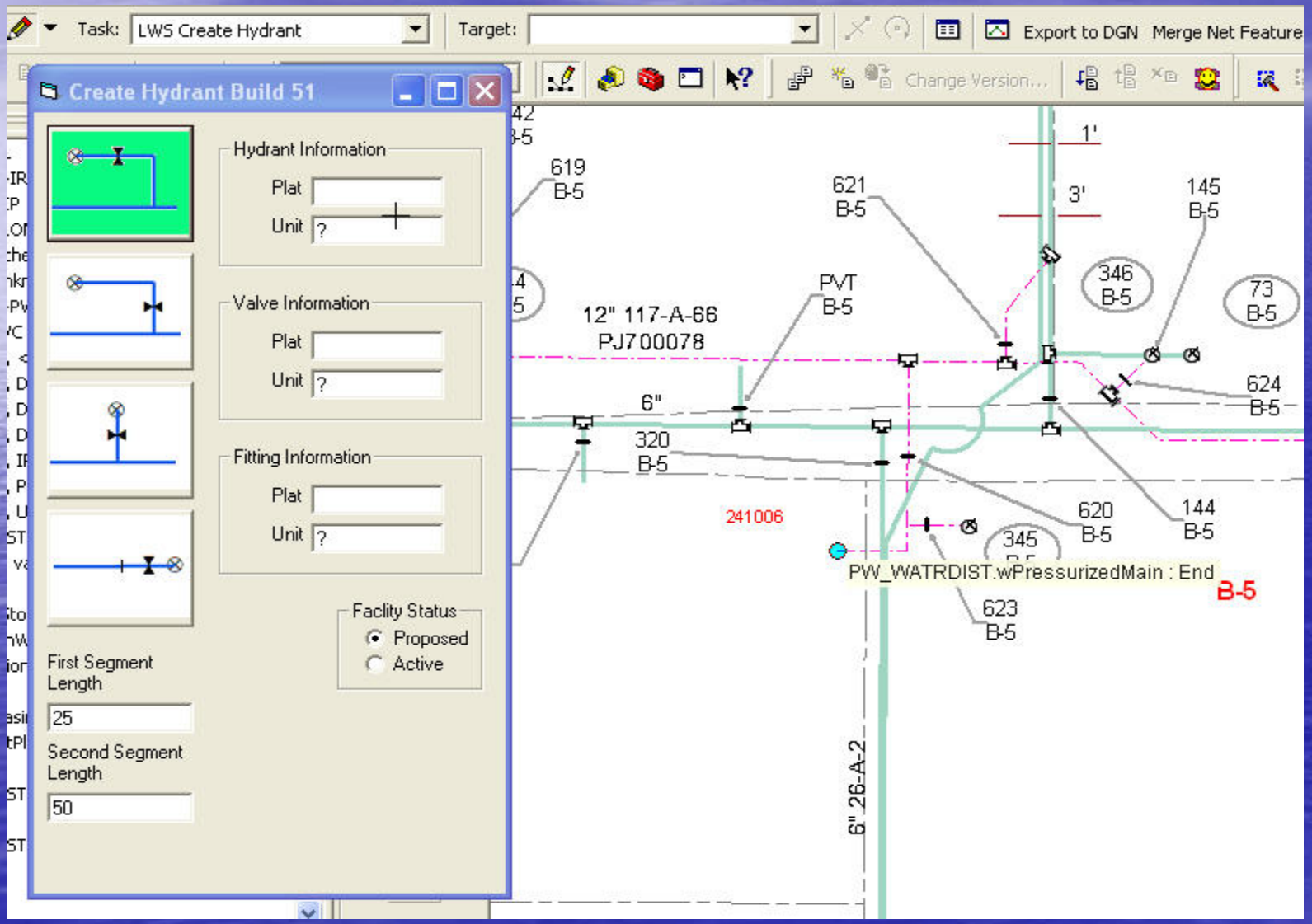
Upgradeable Custom Tools



Custom LNK Create Feature Tool

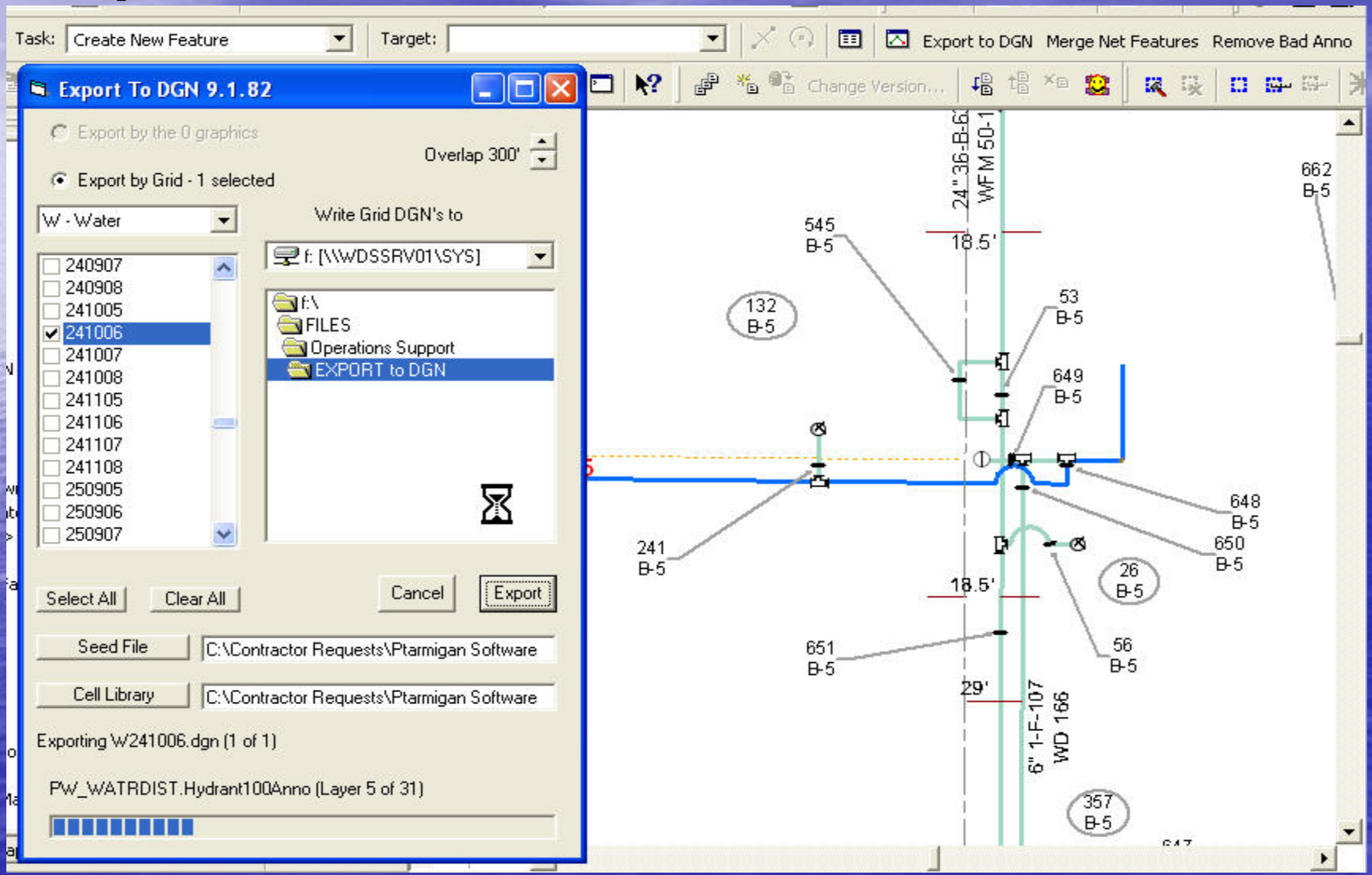


Custom Hydrant Placement

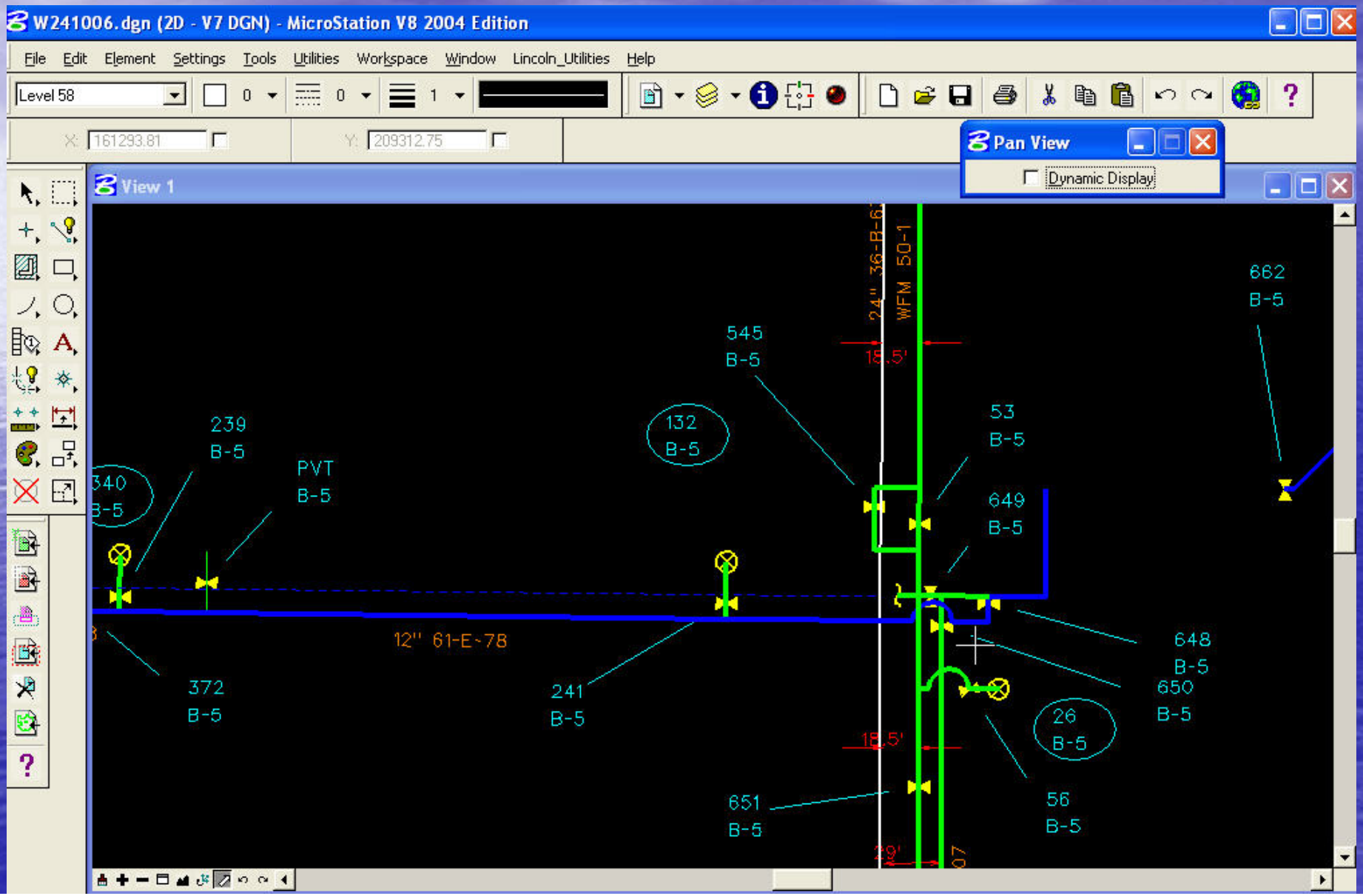


Export to DGN

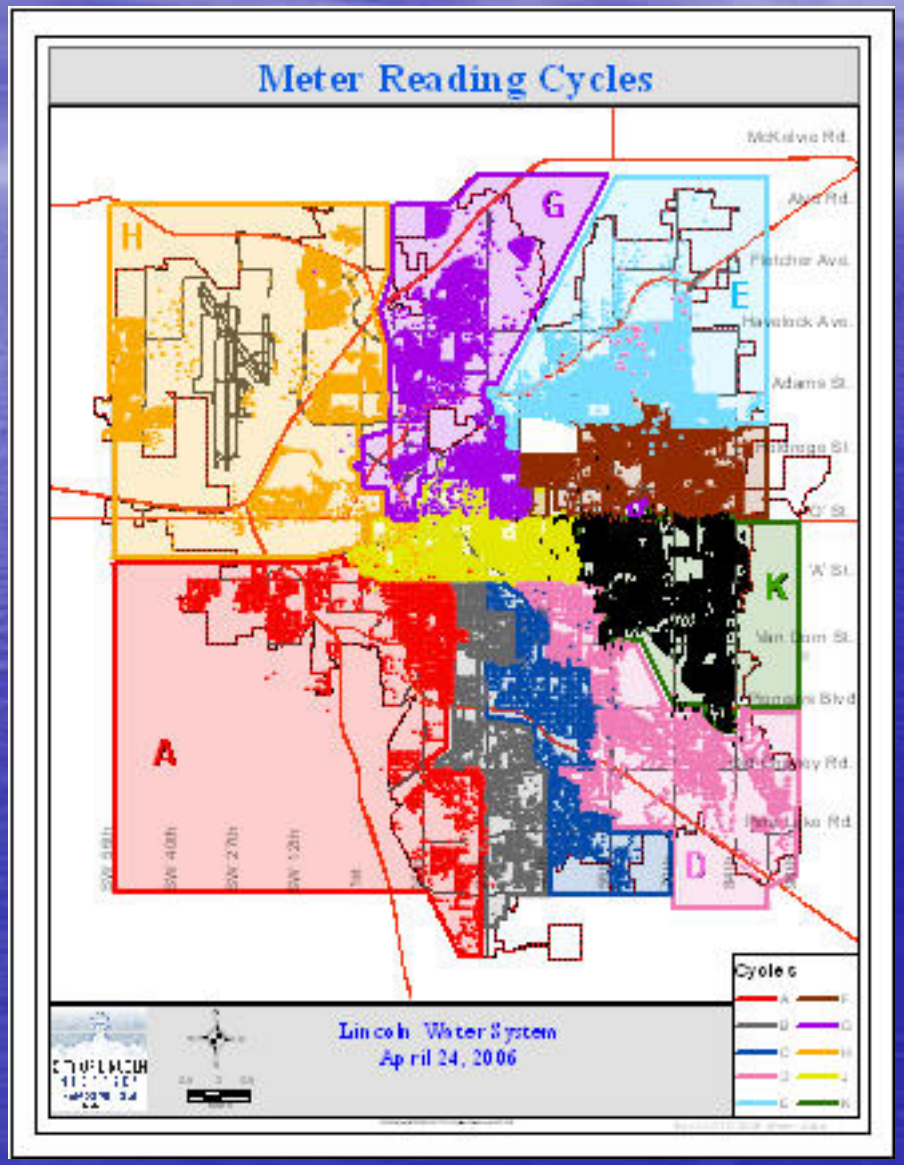
Tool uses Safe Software FME Engine



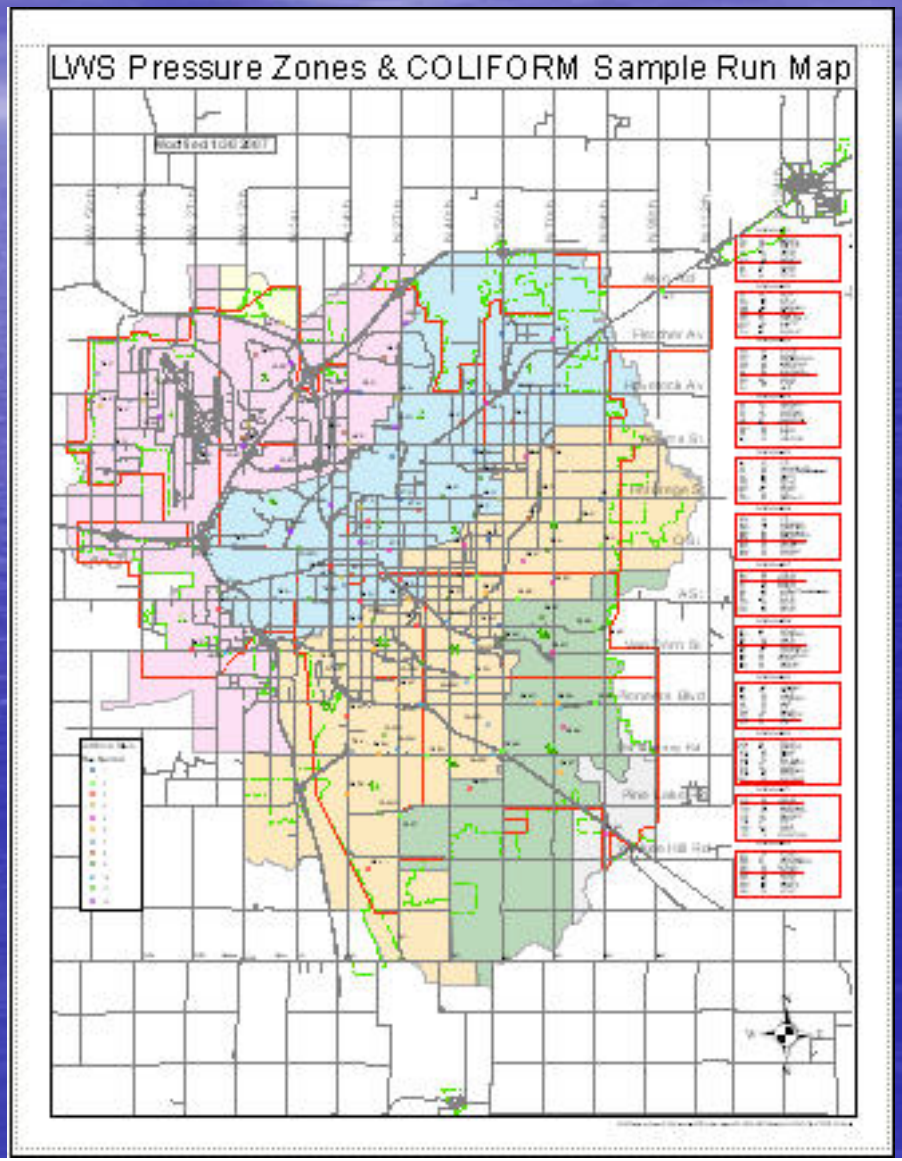
Result of Export to DGN



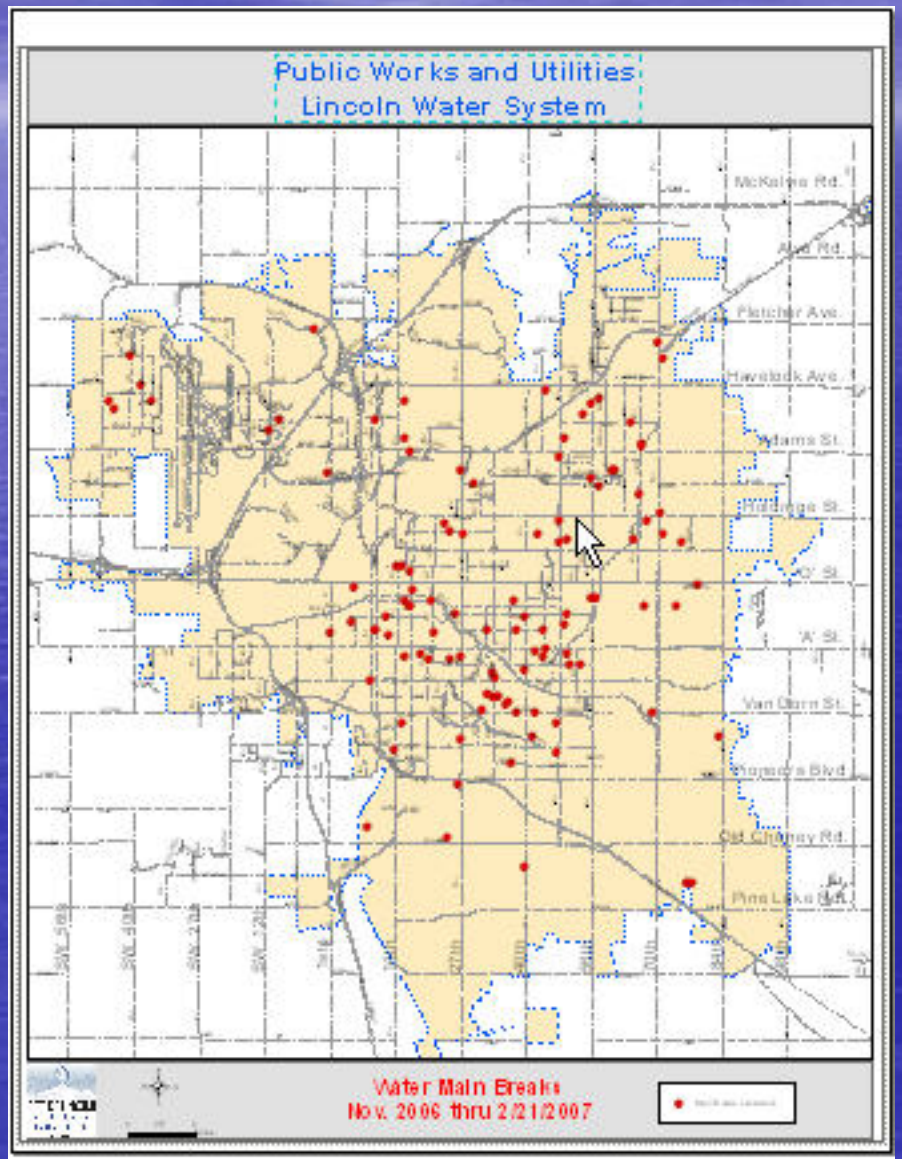
Customer Geocoding & Routing



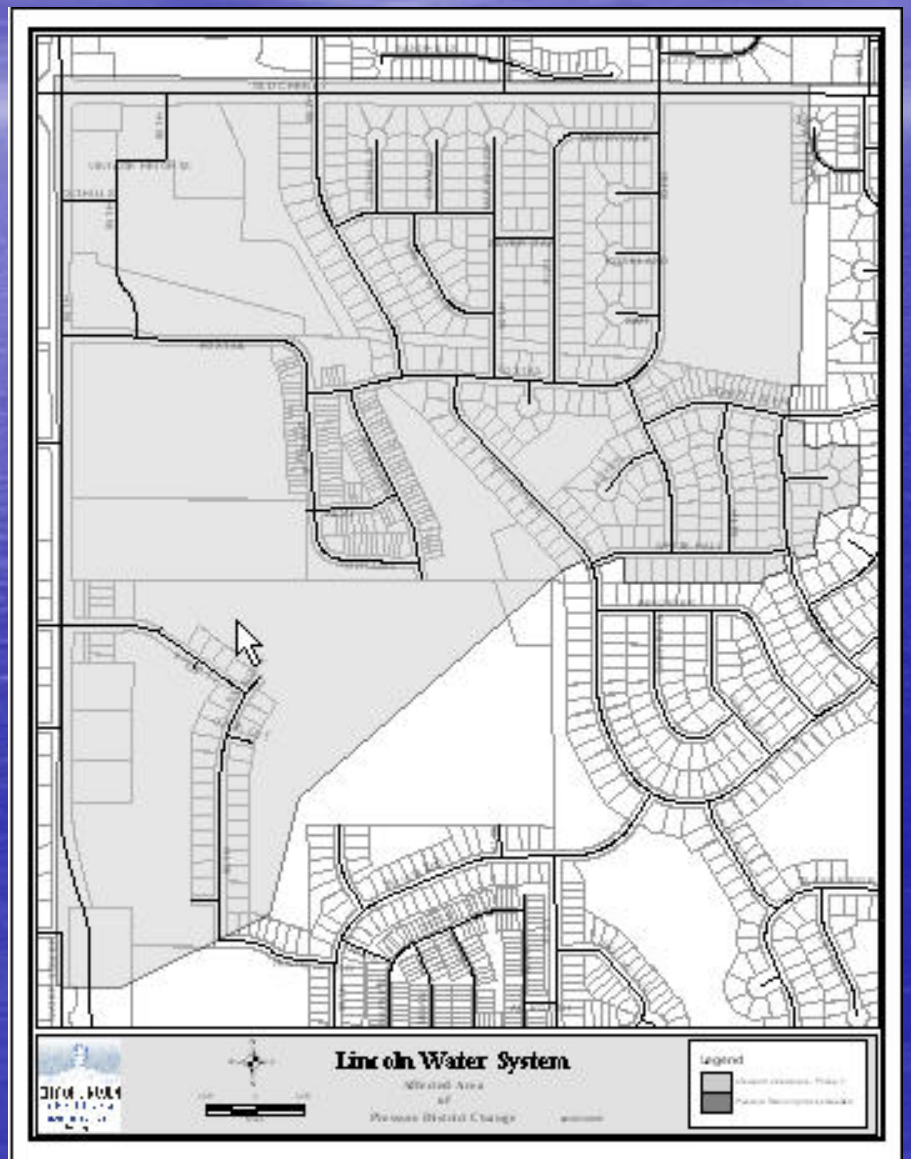
Regulatory Compliance



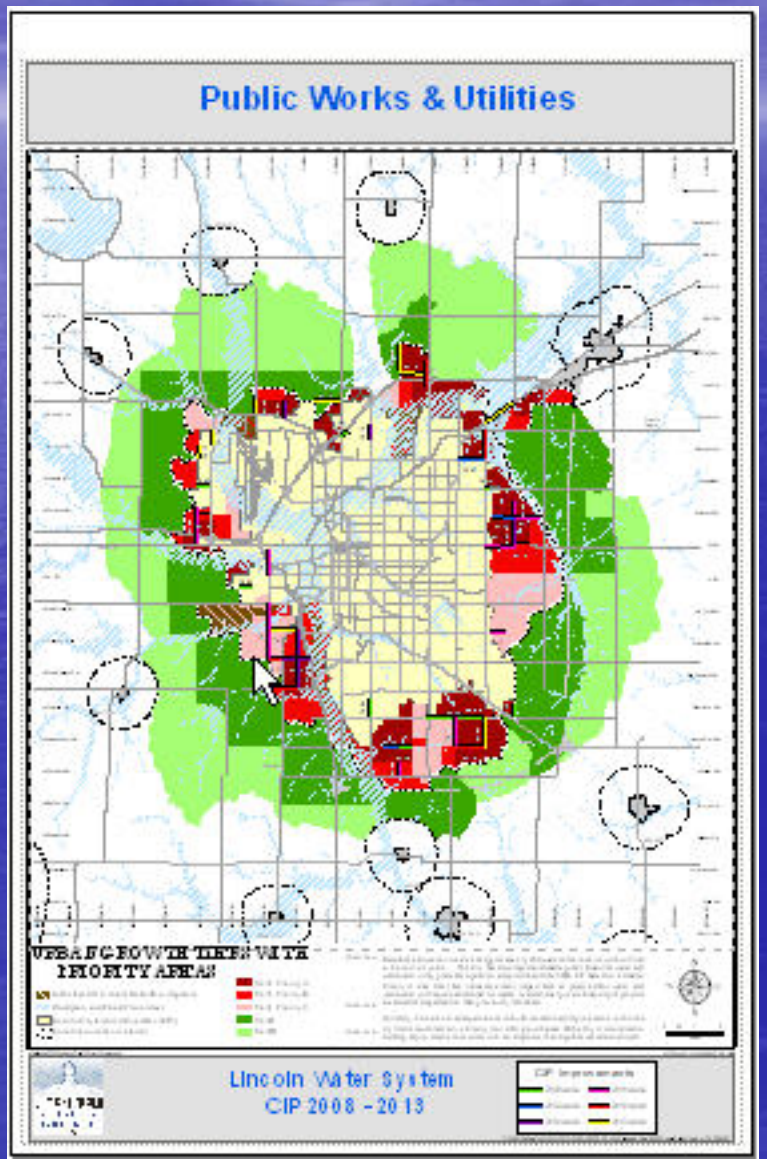
Main Break Analysis



Customer Notification

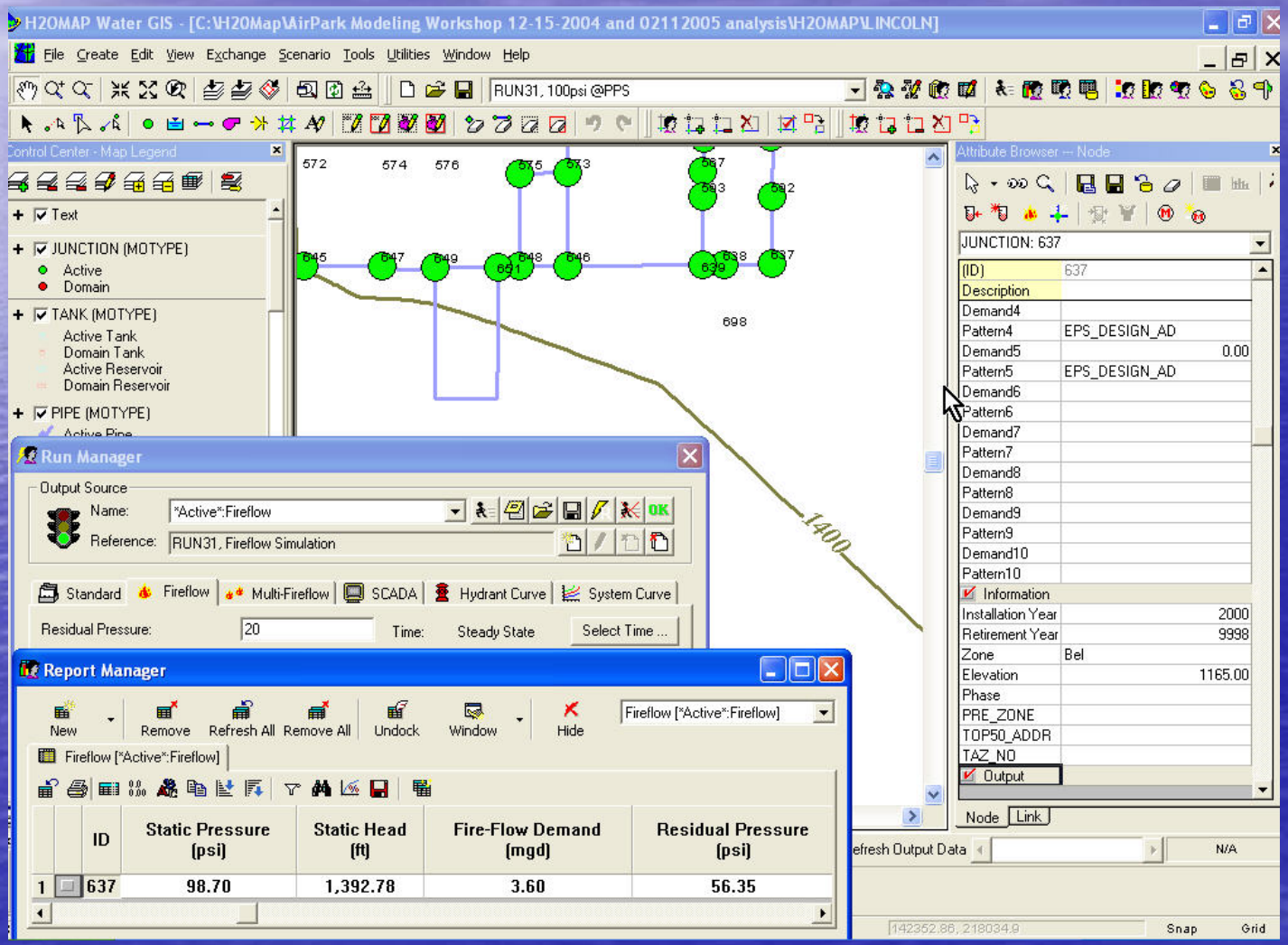


CIP & Plans for City Growth



Hydraulic Modeling

Using MWHSoft, H20Map



Mobile Field Crew Applications

ExtendoFlex, Courtesy of Precision Mounting Technologies

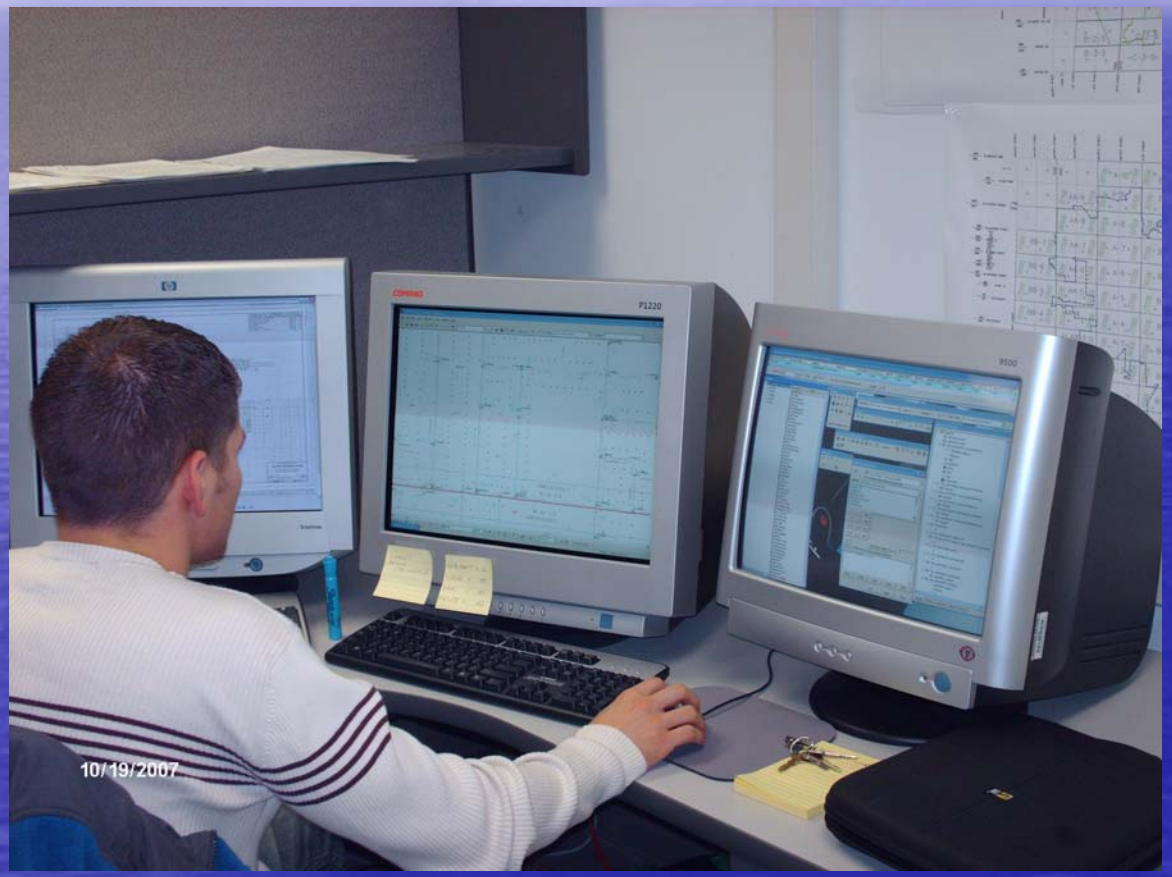
GIS Statistics

- 61,500 Main Segments
- 10,700 Hydrants
- 25,000 Valves
- 19,200 Fittings
- 15,100 Dimension Lines
- 84,400 Annotation Text Segments
- 150 Miscellaneous Features, i.e. Water Structures, RTU's, Power Poles, Meter Pits etc...

Remaining Challenges

- Training Staff to Maintain the GIS
- Revising Internal Procedures –
- "The old way vs. The NEW way"
- Performing QA/QC corrections
- Connecting to Hansen CMMS System
- Ongoing attribution of the GIS with additional data, including scanned record drawing files
- Adding Real Time Data Acquisition (GIS+GPS)

GIS Maintenance



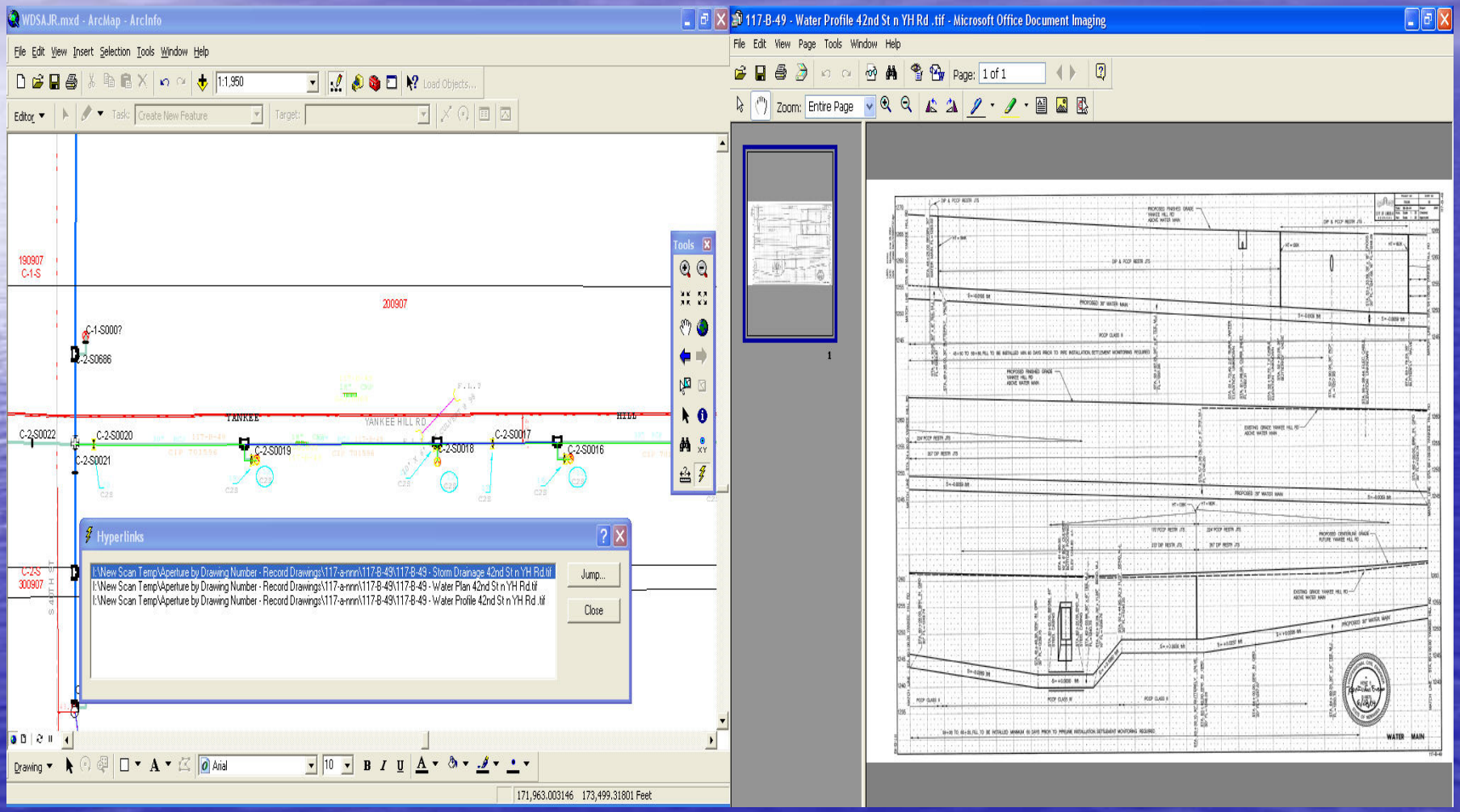
Where is the Valve Box?

GPS helps us find this faster!

GPS Data from Field

Courtesy of Trimble Navigation Limited

Scanned Drawings Attached to GIS



Summary of Most Important Lessons Learned

- Technically capable & accommodating Consultants
- Manage the Expectations for GIS – It's Labor Intensive and runs slower than CAD
- GIS is starting to generate Real Benefits to Management 2 to 3 Years after our initial conversion investment
- Need to "Think Out Of the Box" for creative solutions to everyday problems
- Utilize Mentoring – Improves Acceptance / Performance
- Whenever ANY component is Upgraded – Test Everything
- Patience and Humor are good things to possess when running GIS ☺

Questions?

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