



Effectively Leveraging CAD data in a GIS World

“The pursuit of TVC”

By Rene R. Ramirez

Who is Rene R. Ramirez

- 33 Years in the Mapping business
- 4 Years as a Mapper
- 11 Years Oil and Gas GIS & CAD Development and Management
- 18 Years as CEO of BSD Consulting, a GIS and CAD Development and Consulting firm

BSD Consulting, Inc.

A few of our Customers:

Access Midstream; AECOM; All American Energy Services; Alliance Engineering; Allied Corrosion; Alpha Leak Detection & Pipeline Services; AMEC Paragon Engineering; Applied Consulting Field Services; Aspen Corrosion, Inc.; Atlas Engineering; Atwell; Audubon Field Solutions; Babcock Eagleton, Inc.; Baker Hughes; Bartlett & West; Bechtel; BL Companies; Blue Mountain, Inc.; **Boardwalk Pipeline Partners LP**; Bowman Consulting; **BP**; C.H. Fenstermaker & Associates, Inc.; Cadd Data, Inc.; CAMS Trident; Cardno, Inc.; CEM Resources, Inc.; CCC; **CenterPoint Energy**; **Centurion Pipeline**; CH2MHILL; Chenault Consulting, Inc.; **Cheniere Energy**; **Chesapeake Energy**; Chester Engineers; **Chevron**; Chippewa Resources; **Cimarex**; Cimarron Engineering, Ltd.; Cobbendley; Coler & Colantonio, Inc.; Consolidated Contract Company; Contract Land Staff; Cornerstone Engineering Services; CorrPro; CP Masters; **Crestwood Midstream Partners LP**; Cross Texas Land Services; Crossway Surveying; CSD Engineers LLC; D3 Survey and Mapping; Damian and Associates; Dawood Engineering, Inc.; **DCP Midstream**; **Denbury Resources, Inc.**; **Devon Energy**; Downtown Design Services Inc.; Doyle & Wachtstetter, Inc.; The EADS Group; EDM Services; EMC, Inc.; EMS Global, Inc.; EN Engineering; **Enbridge**; Encompass; Energy Management & Services Company; Energy Land & Infrastructure; **Energy Transfer**; Engineering Service; ENGlobal; EnSite; **EQT Corporation**; Equinox Engineering Ltd.; **Equistar Chemicals**; Erickson Contract Surveying; Ericsson; **Excel Midstream**; Fenstermaker; Fluor; Frank Surveying; Frontier Surveying Company; G2 Partners, LLC; GAI Consultants; Ganem & Kelly Surveying, Inc.; Gateway Services Group; Geophysical Data Management, Inc.; GeoTerra Integrated Resource System Ltd; Golden Field Service; Golder Associates; Gulf Interstate Engineering; Gullett & Associates, Inc.; Hanson Survey; Hatch Mott MacDonald; Herbert, Rowland, & Grubic, Inc.; **Hiland Partners, LLC**; Holland Engineering; Howland Engineering & Surveying Co.; Hunt, Guillot & Associates Pipeline Services, LLC; Ingenieria Dennis; Integrated Pipeline Services, Inc.; Jacobs Engineering Group, Inc.; Joe Hunt & Associates, Inc.; John Chance Land Surveys, Inc.; Johnston Vermette; KBR; Kestrel Engineering, Inc.; **Kinder Morgan**; Kleinfelder; KLJ; L&S Surveying; Lake Superior Consulting; Lamb-Star Engineering; Landmark Survey and Mapping; Larson Design Group; Link Field Services; LIS Technology; LJA Engineering, Inc.; LT Mapping Services, Inc.; LW Survey; **LyondellBasell Industries**; M&H Energy Services; **Markwest**; Maverick Engineering; McElhanney Land Surveys; Meridian Surveying and Mapping; Messinger & Associates; Michael Baker Jr., Inc.; **MidAmerican Energy**; Midco Services, Inc.; Morris P. Herbert; Mustang Engineering; National Pipeline Services; **Northern Natural Gas**; **NuStar Energy**; Open Range Field Services, LLC; **Oxy**; Pelican Energy Partners; Percheron, LLC.; Petersen Engineering, Inc.; PetroFac; PetroIT; Petroleum Field Services; Pipeline Land Services; **Plains All American Pipeline**; **Plantation Pipeline Company**; Point Engineering; Project Consulting Services; Project Limited; Protech EIS Corp; QPS Engineering; R Squared; Raba Kistner Infrastructure, Inc.; Rapid Response; Rooney Engineering; **Rose Rock Midstream, L.P.**; RSH Engineering; Russell Corrosion; S&B; SAM, LLC.; SGC Engineering; Shafer, Kline, & Warren, Inc.; SNC Lavalin; Solaris Management Consultants Inc.; Southern Design Cadworks; Spartan Engineering; Spec Services; **Spectra Energy**; Stantec; Stewart Weir; Structural Integrity; STV, Inc.; **Summit Midstream**; **Sunoco**; Superior Appalachian Pipeline; T. Baker Smith, T.G. Mercer; Territorial Landworks, Inc.; Thrasher Engineering; Three Streams Engineering Ltd.; Titan Corrosion; Topographic; **TransCanada Pipelines**; Transglobal Services, LLC; TRC Solutions; Trico Survey & Mapping; TROW Engineering; Uintah; Universal Ensco Inc.; Universal Geomatic Solutions; Universal Pegasus International; Universal Survey and Mapping; Upside Engineering; Vanasse Hangen Brustlin, Inc.; Wayne Acree, P.L.S., Inc.; Weisser Engineering & Surveying; West Company; Westwood; William H. Smith & Associates; **Williams**; **Williams Gas Pipeline**; Wilson & Company, Inc.; Wink Engineering LLC; Wood Group Mustang; WorleyParsons; **Xcel Energy**; Zero Degrees Surveying & Mapping Services

Evolution of CAD and GIS Data

- History - An Industry in Transition
- Manual Drafting to CAD
- CAD and GIS
- Cloud/Web
- Traceable, Verifiable and Complete

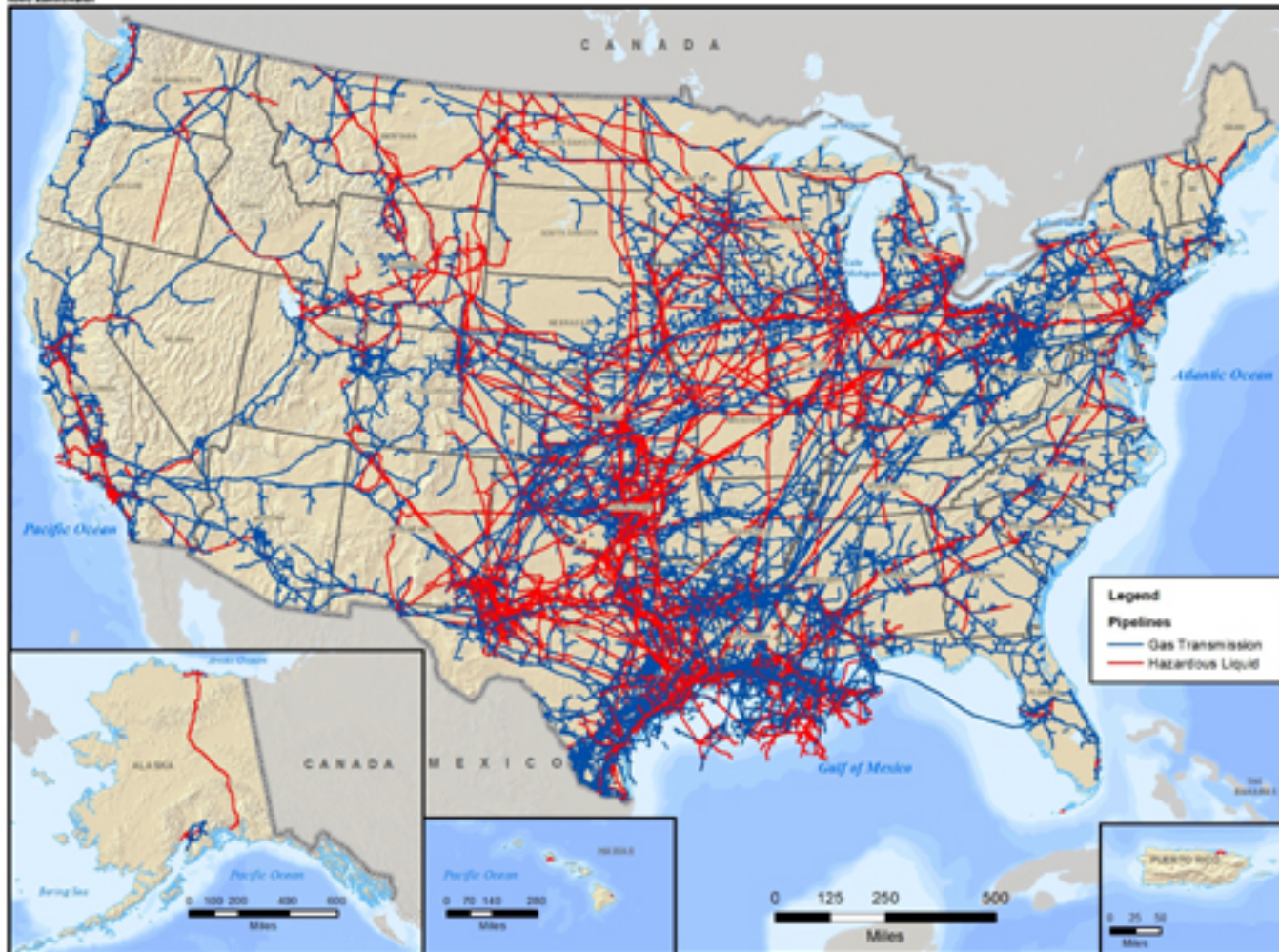
Why CAD and GIS Integration

- Two Datasets that constantly diverge
- CAD is the standard design method for 75% of new construction projects
- Pipeline construction has reached record levels
- Too much data to type in manually
- Reduce cost in the oil downturn
- Traceable, Verifiable and Complete



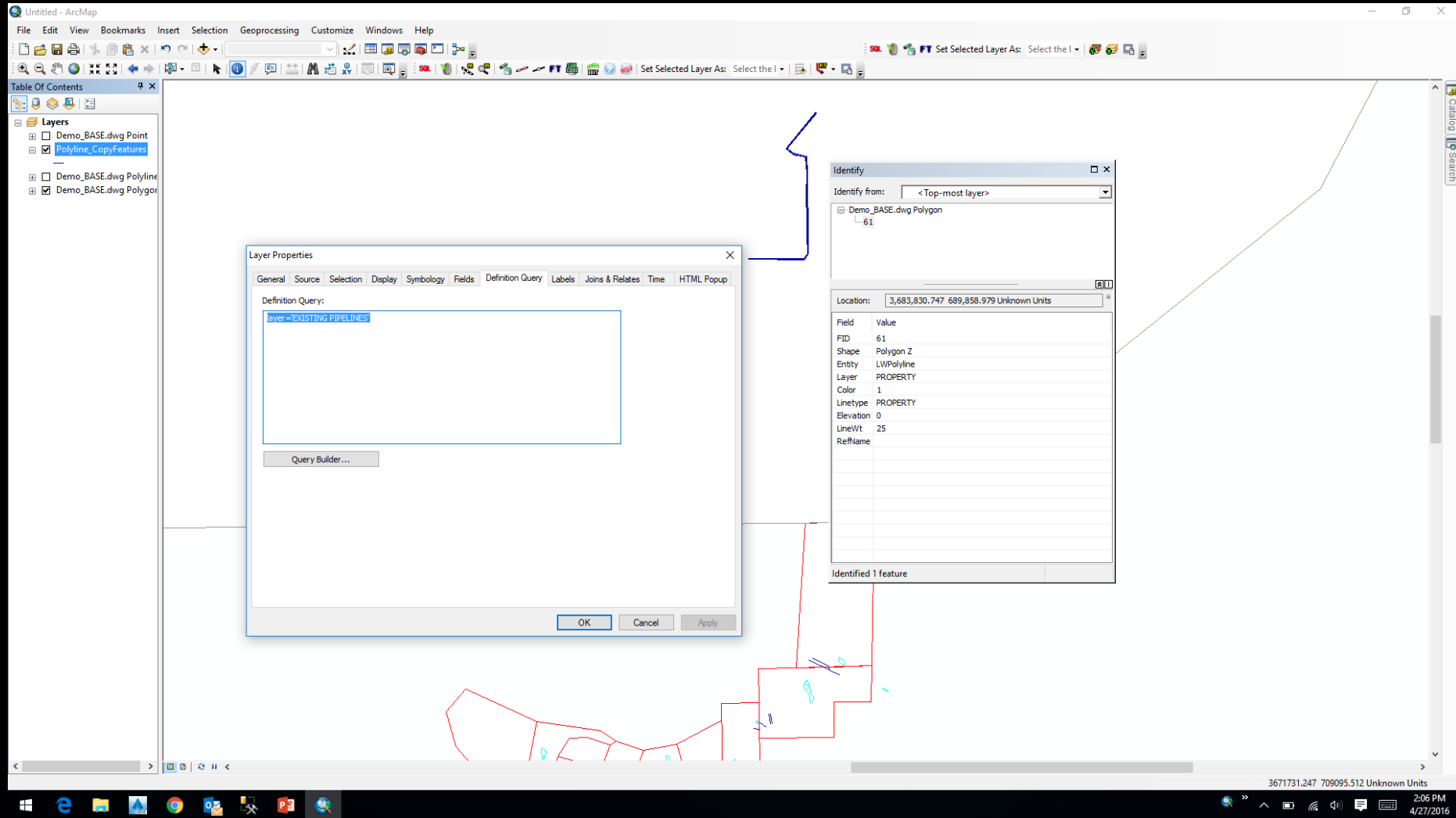
U.S. Department of Transportation
Pipeline and Hazardous Materials
Safety Administration

Gas Transmission and Hazardous Liquid Pipelines in the United States National Pipeline Mapping System

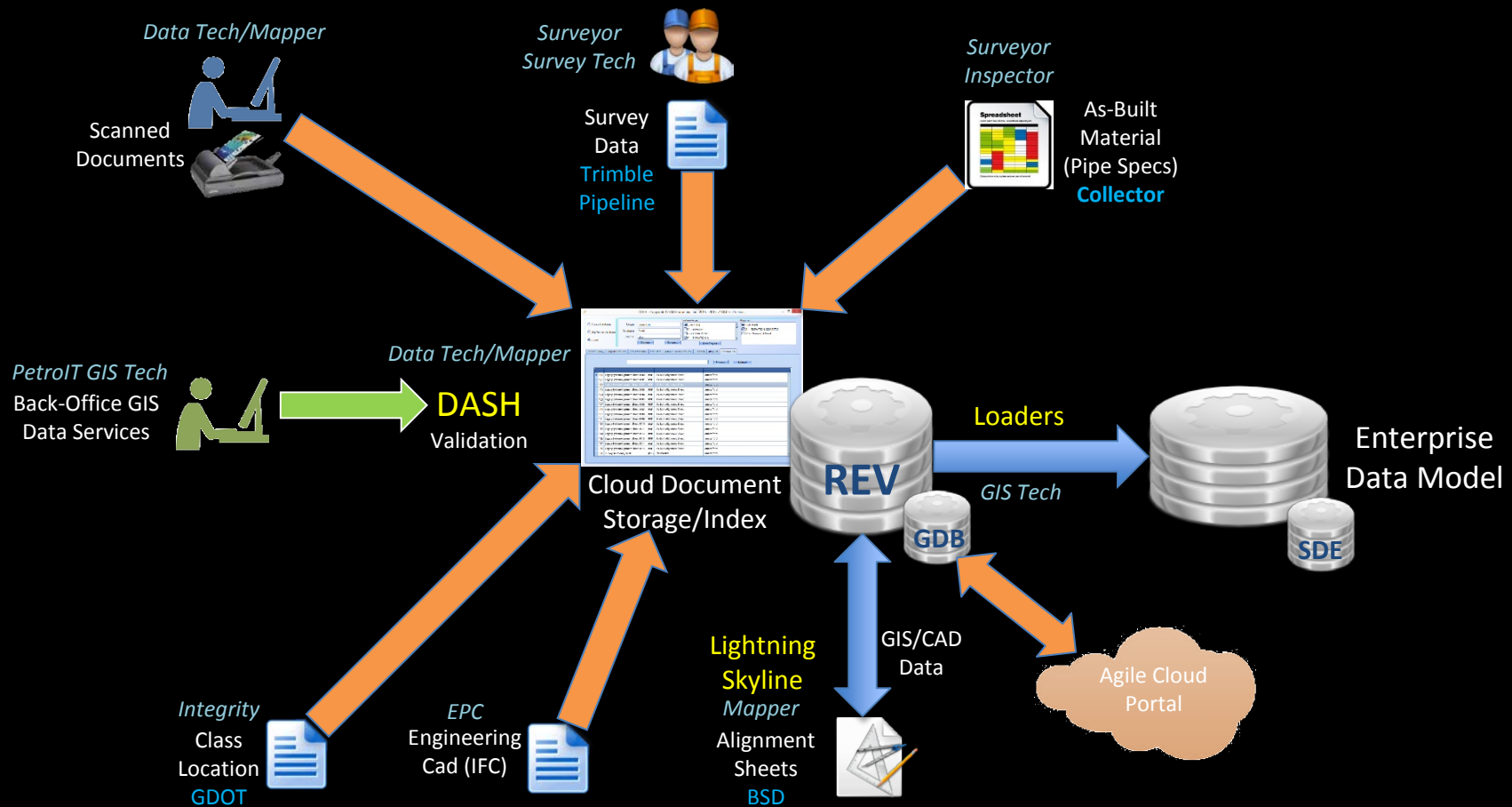


US Pipelines

Working with DWG's in ARC



Legacy Conversion & As-Built Workflow



The Pursuit of 'Traceable, Verifiable and Complete'

Path Forward – Is it Traceable, Verifiable and Complete

Standardize
Incoming Data

Define the Survey Data Map
to the Data Model

Define QA/QC Pressure Points

Define Workflows based on
Project Size

Assign a
Data Coordinator

Define Procurement
Data Process

Define the Document Linking
and Indexing Strategy

The Future

Spatial Model

APR

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