High Confidence Cross Bore Inspection Programs and Gas Utility Data Integration

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What’s the Problem

• Trenchless - does not “see” the potential pipe damage to existing lines

• Sewer utilities are unknown or unmarked, often excluded from 811 in most states

• All buried utilities are at risk – gas and electric have resulted in cross bore inspection programs.
Cross Bores
Cross Bore Explosion, Texas
Cross Bore Explosion, Texas

Gas line

HDD for fiber optics

Sewer lateral

Gas Flow

To House

Class 2 Cross Bore - 2 intersections
Potential Cross Bores - Gas In Sewer (only)

- Sanitary sewers
- Storm sewers
- Yard drains
- Gutter drains
- Cleanouts
- Offset cleanouts
- Branched laterals

Note: Excludes communications, electric & water potential cross bores
Cross Bore Risk, estimated

• 0.4 gas cross bores / mile of gas line installed with trenchless.

• Large projects: up to 3 per mile

• Small projects: 12 cross bores of 147 parcels

• Found at Hospitals and Schools

• Most expensive cross bore explosion reported = $30 million, 2 girls extensively burned
Quantifying Cross Bore Elimination for Gas

• Cross bore risk occurs with trenchless installations
• Approximately 80% of identified gas cross bores are of sewer laterals
• Number of gas/sewer cross bores => estimated >250,000
  • No cross bore risk results from joint trench, open trench or inserted pipes (in most cases).

Note: total gas distribution pipeline main and services, U.S. 3.45 million miles

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1 Compiled from U.S. Department of Transportation
2 Extrapolated from average of numerous gas cross bore programs
Estimates of Costs, Gas Legacy and Gas New Construction

- New construction cross bore inspections, installed using trenchless => 4 to 6.5% average of construction costs
  - Verifying large projects are lower cost
  - Verifying single services are higher cost
- Total gas distribution leaking pipe replacement is $300 billion\(^1\)
- Legacy inspection costs are essentially the same order as new installation inspections
- Known non-trenchless installation can be eliminated from risk using utility records with high confidence.

\(^1\) *Underground Construction Magazine, Jan. 2018* - Using estimates from the American Gas Association and PHMSA data, the cost to replace leak-prone pipe in the United States is still greater than $300 billion.
Benefits for Elimination of Cross Bore Risk

- Safer operations – system integrity is known
- Meets regulatory requirements
- Proactive efforts provide positive public perception
- Catastrophic incidents are expensive
  - injuries, damages and reputation loss
- Planned risk reduction programs are less disruptive and less expensive than reactive efforts
GIS Digital Data – Prioritize with Risk Analysis Data
Future Data Integration – Track Installation of Gas Pipe Lines and the Materials

- **ASTM F2897 - 15a, Standard**
  Specification for Tracking and Traceability Encoding System of Natural Gas Distribution Components (Pipe, Tubing, Fittings, Valves, and Appurtenances)
  - Track materials with GPS location, time, date

- **Record HDPE pipe Fusion**
  - temperatures, OQ operator and location
  - Create as-built drawings
Future Risk Reduction, Using Data for Integration & 811 Locates

- Integrate data from cross bore, leak survey, construction and other internal sources.
- 811 Locates can be generated with GIS maps
- Fortiss BC presented the average time to respond to a request was 18 minutes
- Reduces wait time, increases 811 effectiveness, lowers cost
Using Inspection and Installation Data Across Enterprise

- Digital and geo-referenced data (GIS) increases productivity and safety, with faster updates resulting in accurate info.
- Digital data is collected in the field for all asset changes, inspection and maintenance – GIS Maps
- QAQC capability is enhanced
- GIS information served to design, invoicing, maintenance and installation teams for more efficient operations.
- Identify bad products for replacement with geo-referencing.
- Better long range planning for the enterprise.
Thank you!

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