Analysis of PHMSA NPMS Information Request Proposal

Pipeline & Hazardous Materials Safety Administration
National Pipeline Mapping System – Public Meeting
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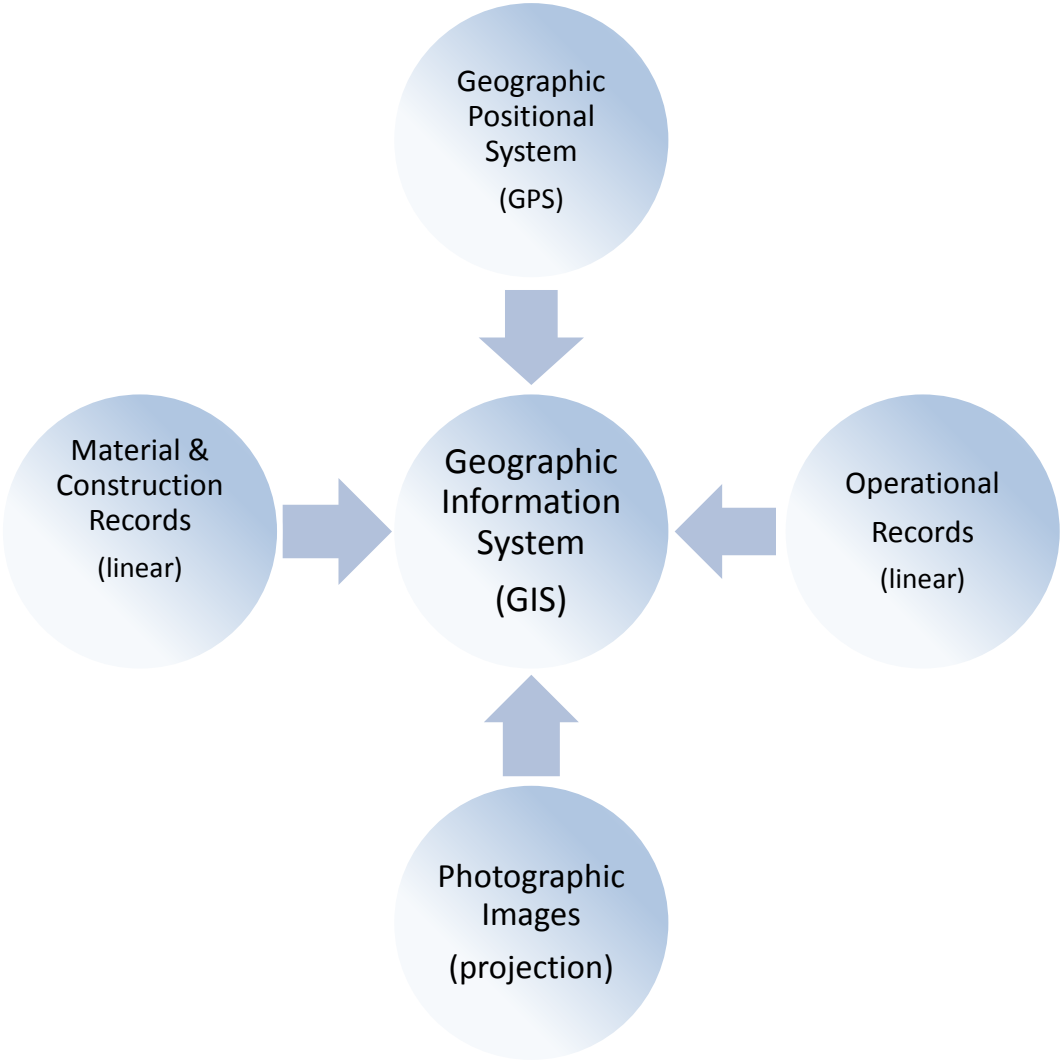
TransCanada

Representing INGAA

Gas Pipeline GIS Concepts



Spatial Accuracy Error is Cumulative

- Identification of centerline of pipe
- Spatial location methods
  - Excavation + Professional Survey
  - Line probing + Professional Survey
  - Inertial Measurement Unit (IMU) during Inline Inspection (ILI)
  - Photographic image placement (pipeline scar/markers)
- Placement on Base Maps
  - Projection Errors (Vertical Elevation; Distortion)
  - Range of quality

Gas Pipeline Spatial Accuracy

- Method (by increasing accuracy)
  - Survey Notebooks
  - Photo Image Matching
  - GPS Appurtances
  - GPS Pipeline
    - Inline Inspection (ILI) with Inertial Measurement Unit (IMU)
    - Direct Assessment(DA) with Professional Survey

Present Status of INGAA Members

- All members have working GIS systems that are constantly evolving
- Spatial coordinates submitted to NPMS are the same as the existing member's GIS systems
- Members are conservative in reporting pipeline segment spatial accuracy to NPMS
- Spatial accuracy of pipeline centerline varies by
  - Pipeline Company
  - Pipeline Segment
- Attribute designations vary by INGAA member

Present Status of Emergency Responder (ER) Information Needs

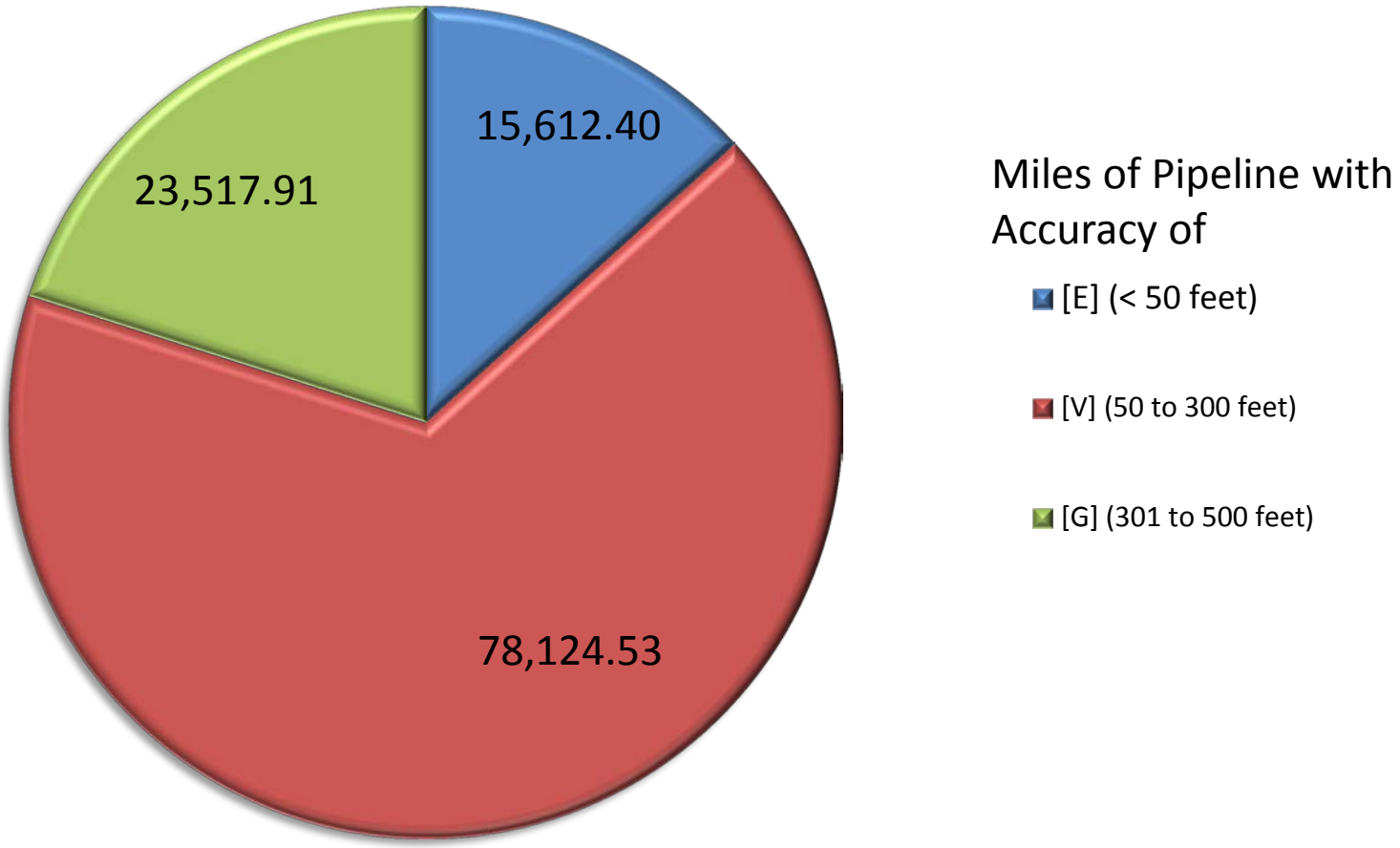
- INGAA conducted Survey through Paradigm Inc.
  - March 2014, ~1000 ER respondents across U.S.
  - Preferred digital or paper map with photo background provided by **pipeline operators**
  - Most useful information needed by ER
    - Location
    - Commodity information
    - Emergency Contact Information
  - Present positional accuracy* is not compelling issue
    - 68% of respondents said they did not need improvement
    - Remaining respondents were happy with 100 foot positional accuracy

*Accuracy relative to background information

INGAA Survey and Analysis to Implement PHMSA Information Request

- Survey results represents 132,000 mile with all respondents having GIS system (11,000 miles within HCA or Class 3,4)
- Detailed survey (38 categories with 4 part questions)
- Availability of 31 linear attributes per PHMSA format and accuracy requirements
  - Ranges from 0 to 3,064 miles per attribute within HCA or Class 3,4 (in accordance with PHMSA accuracy and format)
  - Ranges from 0 to 28,000 miles per attribute within other areas (in accordance with PHMSA accuracy and format)

Pipeline Centerline Accuracy within GIS System
(INGAA Survey Results)



Assumptions for INGAA Estimate

- 5’ Centerline and linear attribute accuracy in HCA and Class 3,4
- 50’ Centerline and linear attribute accuracy in Non-HCA Class 1,2
- Strict interpretation of PHMSA proposed information collection
- Requirement to massage data into PHMSA allowed format
- Applies to mainlines and laterals (does not include compressor stations, meter stations, or other ancillary facilities)

INGAA Cost Analysis of PHMSA Information Request

- Willbros commissioned to do INGAA cost estimate of IR
  - Reviewed GIS and record management practices of 4 major INGAA members
  - Assessed major new technologies and processes for spatial and linear pipeline data
  - Cost per mile to gather and integrate data
    - $4,510 per mile for 50’ accuracy
    - $11,580 per mile for 5’ accuracy
  - *Total Cost Estimate **$820,000,000** for INGAA membership*
  - Estimate does not include
    - Member GIS system upgrades
    - PHMSA submittal process
    - PHMSA implementation to accommodate submittal.

Questions?