Extending Linear Referencing System (LRS) capabilities to Pipeline organizations

Anjali Bhangay and Summer Hall
Pipeline Referencing
Functionalities and Capabilities

Information Model
Data Management
Geoprocessing
Web Services

ILI Analysis
Alignment Sheets
Generators
Risk Assessment
and Modeling

Transmission Distribution
Simulation and Optimization
Engineering Pipeline
Design

Consulting & Data
Migration
Maintenance Management
and Planning

HCA Analysis
ArcGIS Pipeline Referencing

Utility and Pipeline Data Model

Partner Solutions & Services

Online Content and Services

ArcGIS Data Reviewer

ArcGIS Workflow Manager

Esri Production Mapping
Location Model
Schema for route centerline management

**Routes** *(Network)*
Route features

**Centerline**
Line feature class that stores route geometry

**Calibration Points**
Point feature class that stores route measures

**Centerline Sequence**
Key table for M-N relationship between Centerline and Route

Separate feature class for each LRM

*…with support for Engineering Stationing*
LRS Network A and B routes are derived from same centerline lines.
Event Location Referencing

- Route and measure
- Stationing
- Referent and offset
  - Intersections
  - Events
  - Features
- Coordinates and offset

...events are feature classes
Route Editing Activities

- **Create Route**
- **Extend Route**
- **Realign Route**
- **Reassign Route**
- **Retire Route**
- **Calibrate Route**

Can also serve to **split routes** and **merge routes**
When the LRS routes are edited, measure behavior rules can be applied to events.
Temporal Model

Realignment

Before

After
Platform Components
Pipeline Referencing Desktop

ArcMap and ArcGIS Pro add-ins

LRS Administration
- Create ALRS
- Configure Networks
- Configure Events
- Load Network

ArcMap

ArcGIS Pro

LRS Network Editing
- Edit routes
- Edit centerlines
- Edit calibration points
- Event behaviors
- Event Loading

Side-by-Side
Geoprocessing Tools

- **Loading**
  - Event Loading

- **Data Transformation**
  - Event Measure Behaviors
  - Dynamic Segmentation
  - Measure Translation
  - Event Shape Generation
  - Route Shape Generation
Pipeline Referencing for Server

- **ArcGIS Server**
  - Mapping, Query, Geoprocessing, …

- **Pipeline Referencing for Server**
  - Event editing
  - Coordinate to measures
  - Measure to coordinate
  - Query attribute sets
  - Check events *(gaps, overlaps, invalid measures)*
  - Measure translation
  - Measure updates for external systems
Event Editor

- **Editing**
  - Lines and Points events
  - Tabular selection results
  - Attribute set results

- **Selection**
  - Select by route, attribute, geometry, proximity
  - Single layer results or attribute sets

- **Error Checking**
  - Gaps, overlaps, invalid measures
  - Data Reviewer batch checks
Demo
Please Take Our Survey! – No more memorizing Session ID numbers!! 😊

Download the Esri Events app and find your event

Select the session you attended

Scroll down to the “Feedback” section

Complete Answers, add a Comment, and Select “Submit”