Managing an Outside Plant Fiber Optic Network with GIS

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Frankfort Plant Board History

- Electric & Water Service since 1943
- Cable service since 1952
- High Capacity Fiber since 1997
- Largest municipally owned cable company in U.S.
- Services the State Capital of Kentucky
FPB Services

- High-Speed Internet Access
- Telephony Service
- Cable Television
- Water
- Electric
- Security Services
FPB Fiber Optic Network

- Expanding the Full Service Network
- Provides service to 20,000 customers
- Fiber Optic Network supports:
  - Internet Access
  - Dark Fiber
  - High Capacity Internet
  - Cable Television Nodes
  - Telephony Applications
Need for GIS Based Management

- Massive Fiber System Expansion
- Network Expert was retiring
- Record Keeping was Inefficient and Complex
- Integration with Gas and Water GIS
- Company-wide Access to Data
- Fiber Network Analysis and Reporting
Old Management System

CAD File

Connection Spreadsheet
Fiber Optic Network in GIS
Uses of the GIS Data

- Call Before You Dig Program
- Operations Maps
- Annual and Ad Hoc Reporting
- System Planning and Expansion
- System Visualization with Electric and Water
- System Analysis
Connecting the Network
Splicing Fibers
Splicing Challenges

- Poor Source Documents for Connectivity
  - Difficult to interpret
  - Information was out-of-date
- Fiber Optic Expert had Retired
- Tracing tools helped discover the connectivity
- Some field checking was required
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Connecting a Patch Panel
Tracing the Network
**Lengths Illustrated**

- **GIS Length**: 1000 ft.
- **Slack Loop**: 200 ft.
- **GIS Length + Slack Loop**: $1000 + 200 = 1200$ ft.
- **Start Footstamp**: 5000 ft.  
- **End Footstamp**: 6300 ft.
- **Footstamp Length**: $6300 - 5000 = 1300$ ft.
- **Glass Length**: $1300 \times 1.01 = 1313$ ft.
- **Field Notes (OTDR) Length**: Measured at 1324 ft.
OTDR Outage
Conclusions

- Enterprise GIS improved system management
- Data available company-wide for many uses
- GIS provides a rich way to capture, analyze and report on the network data
- Many benefits despite partial data capture
- The data will improve as the system is used
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Questions?

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