

Inventory, Implementation, and Planning of ITS using customized GIS Tools

Case Study

NCDOT ITS Fiber management



Using GIS to Manage Your ITS

- **Introduction**
 - NCDOT Communications Study
 - Inventory Needs
- **GIS Planning**
 - IT Design Process NCDOT Case
- **Demonstration**
 - NCDOT ITS GIS
- **Wrap-Up**
- **Questions and Answers**

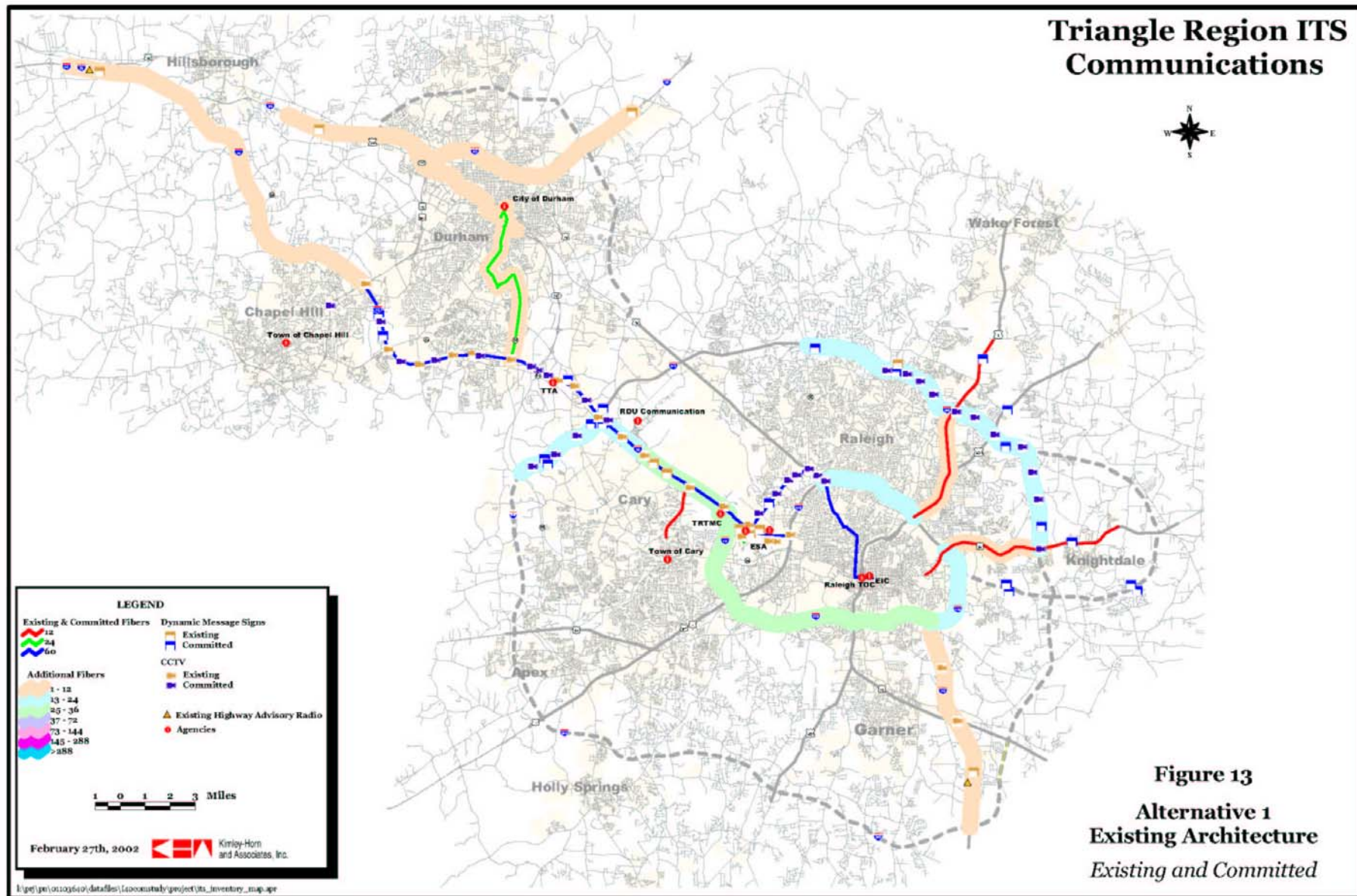


Need for NCDOT Communications Study

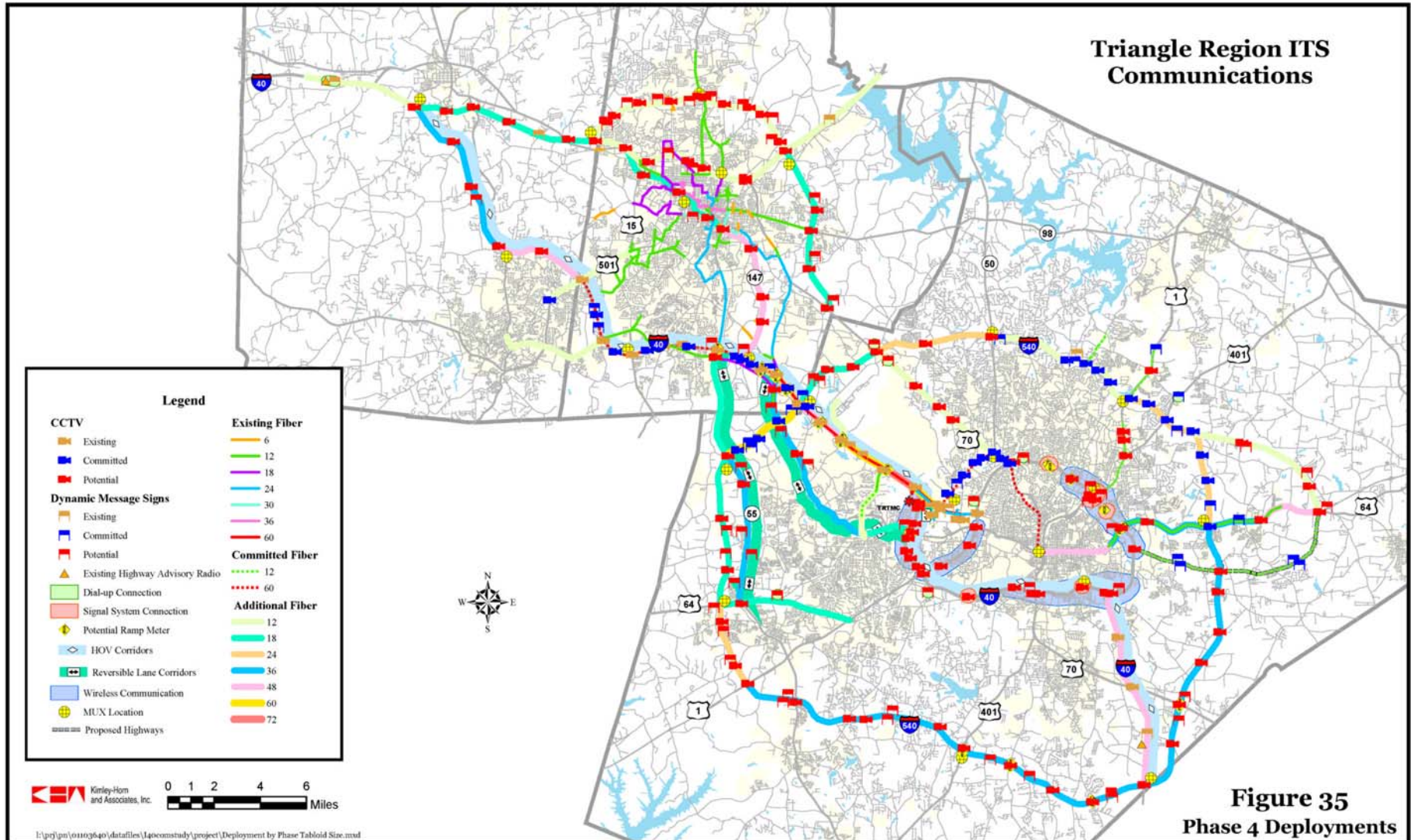
- Deployed ITS Infrastructure Over Last 5 Years
- Recently Completely 20 Year ITS Strategic Plan
- No Real Means of Tracking What has Been Installed
- Challenging to Track Communication Plant



NCDOT Communications Study



NCDOT Communications Study



NCDOT Communications Study

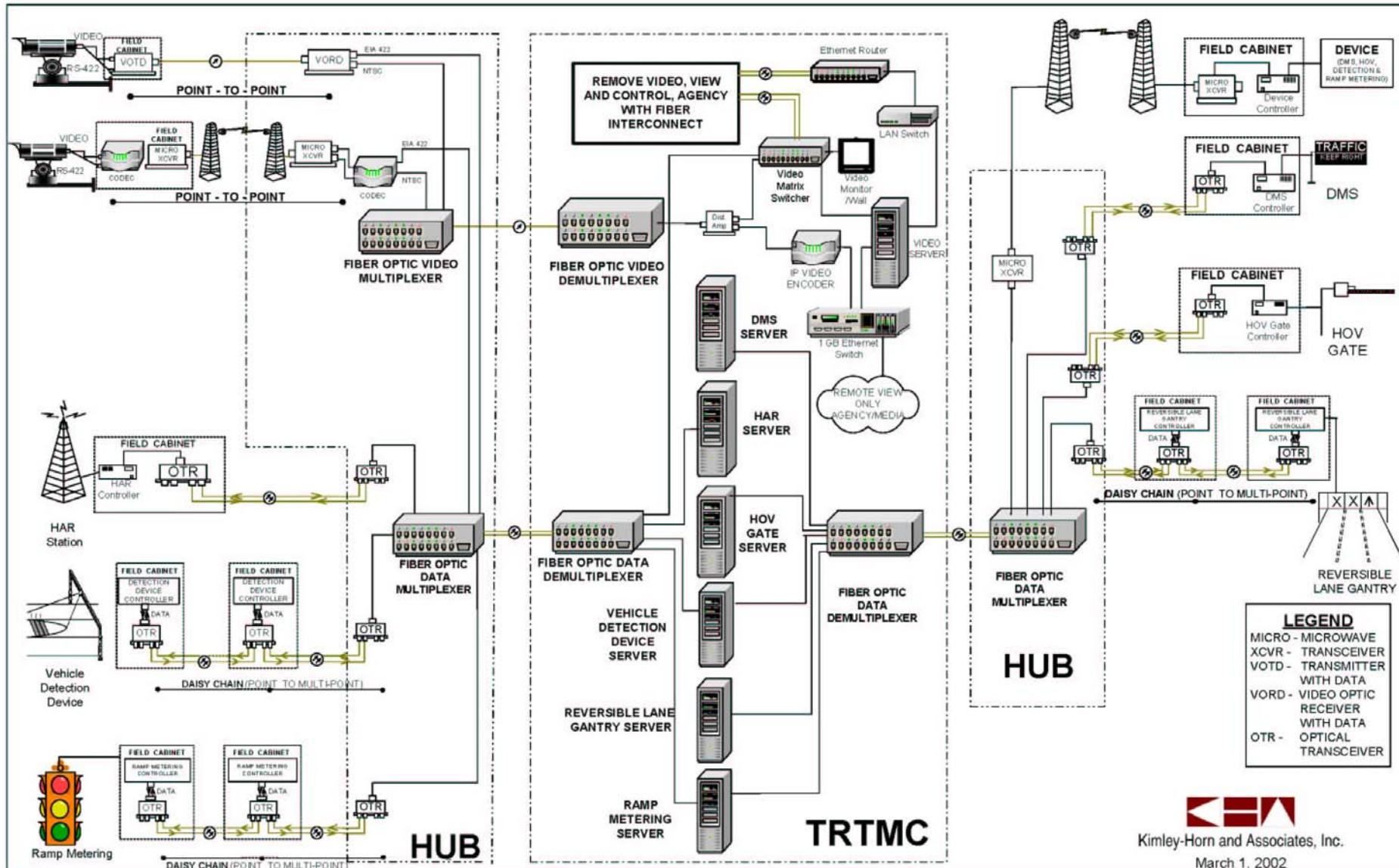
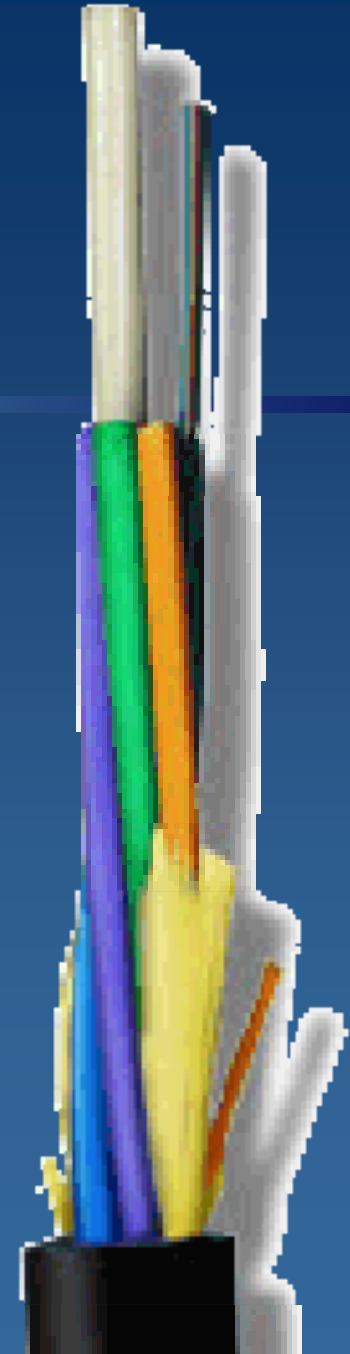


Figure 30. Recommended Field and Central Architecture

Data Structure

Fiber Tree

- Line
- Conduit
- Duct
- Cable
- Buffer Tube
- Fiber



NCDOT Project

- | | |
|------------------------|--|
| 1. Where we are | 1. Inventory of existing ITS field component and communications network data |
| 2. Where we want to go | 2. Assessment of regional communications needs |
| 3. How we get there | 3. Functional specifications for required communications architecture |



IT Design Process

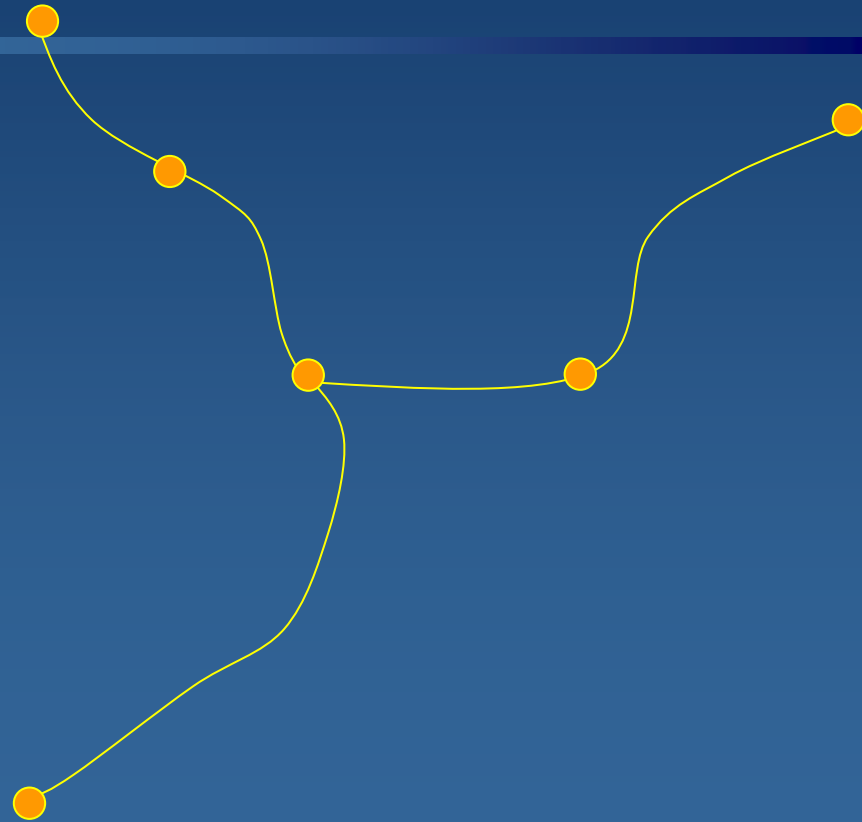
1. Determine Your Information Needs
2. Design Database
3. Design Tools
4. Build Database
5. Implement in Your Management
6. Maintain Database
7. Analyze Database



Data Structure

Line-Node Topology

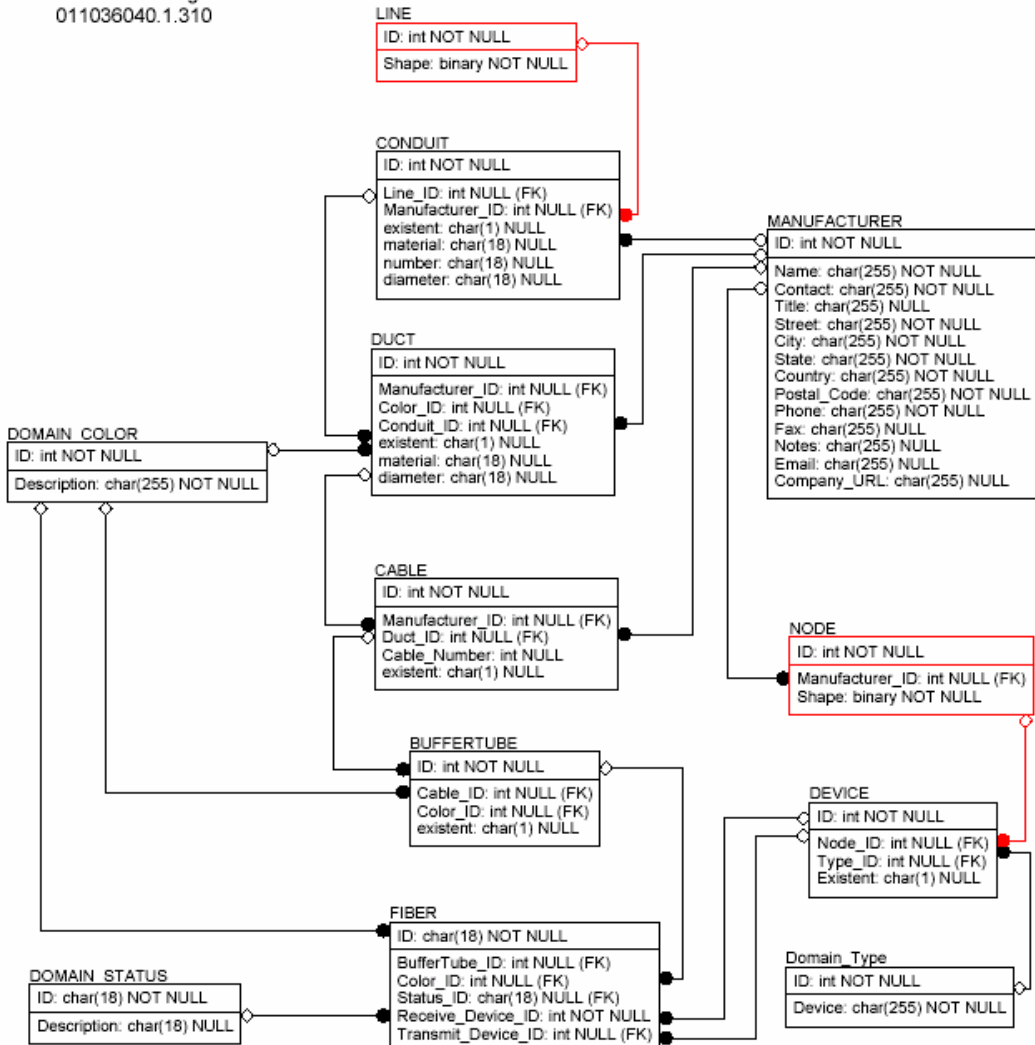
- Lines = Conduits for fiber
- Nodes = Devices or Splices



NCDOT ITS GIS

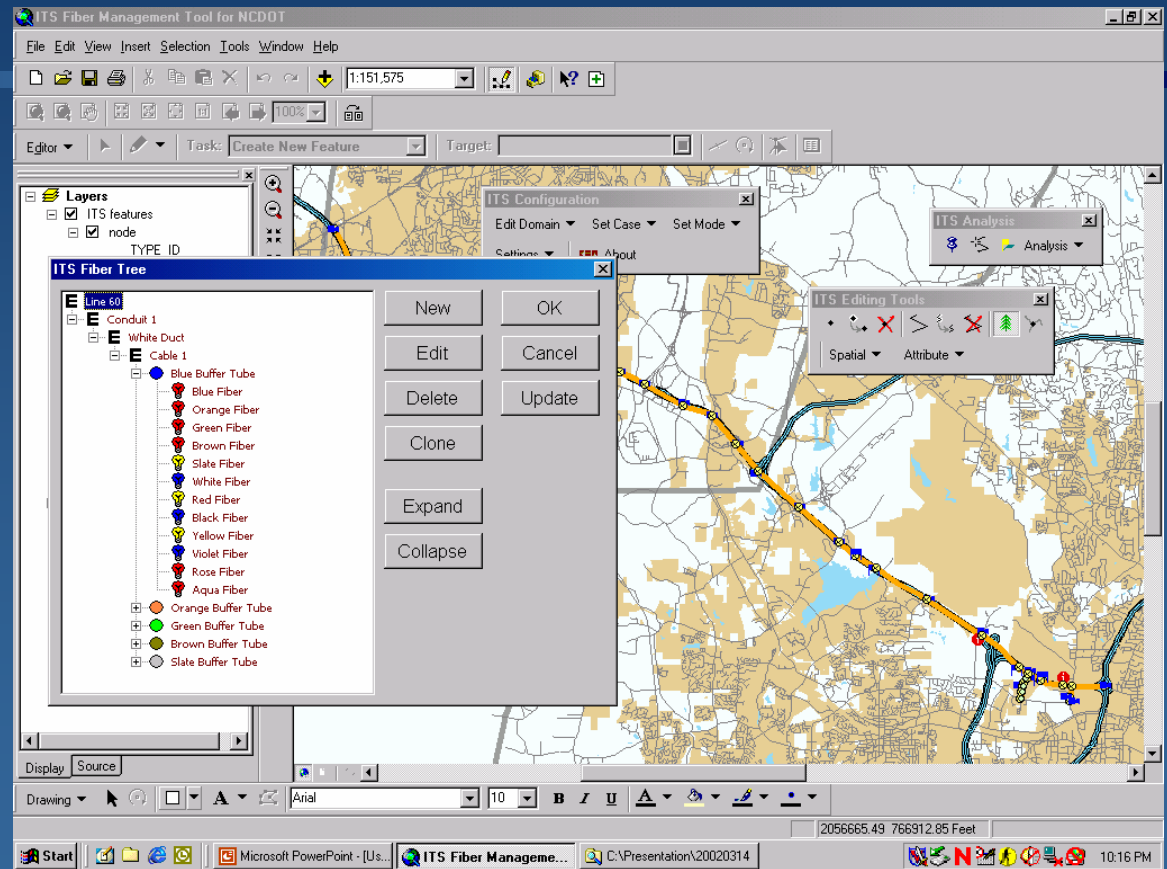
140 ITS Inventory

Database Design
011036040.1.310



NCDOT ITS GIS

- Intelligent Transportation System (ITS) Inventory
- Devices
- Fiber
- Connectivity



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Demonstration



Layers

- topology
 - node
 - TYPE_ID
 - Gantry
 - Unknown
 - CCTV
 - DMS
 - MUX
 - TMC
 - Splice
 - line
 - CASE_ID, user_flag
 - Existing Case
 - Existing Case (Selected)
 - Future Case
 - Future Case (Selected)
- Background Layers
 - streets_triangle_sp83_feet
 - interstates_sp83_feet
 - regwater_sp83_feet
 - munibounds_sp83_feet

ITS Analysis

Analysis

ITS Editing Tools

Spatial Attribute

ITS Configuration

Edit Domain Set Case Set Mode Settings About

Layers

- topology
 - node
 - TYPE_ID
 - Gantry
 - Unknown
 - CCTV
 - DMS
 - MUX
 - TMC
 - Splice
 - line
 - CASE_ID, user_flag
 - Existing Case
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- Background Layers
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 - regwater_sp83_feet
 - munibounds_sp83_feet

ITS Node Editor

NCDOT ID (State ID) :

Name / Use :

Location :

Electrical Meter Number :

Phone Number for Electrical :

Device Type :

Manufacturer :

Owner :

Model :

ITS Analysis

Analysis

ITS Configuration

Edit Domain Set Case Set Mode Settings About

Layers

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 - node
 - TYPE_ID
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ITS Fiber Tree

- Line 97
 - Conduit 1
 - White Duct
 - Cable 1 (Single-Mode)
 - Blue Buffer Tube
 - Blue Fiber
 - Orange Fiber
 - Green Fiber
 - Brown Fiber
 - Slate Fiber
 - White Fiber
 - Orange Buffer Tube
 - Green Buffer Tube
 - Blue Fiber
 - Orange Fiber
 - Green Fiber
 - Brown Fiber
 - Slate Fiber
 - White Fiber
 - Brown Buffer Tube
 - Blue Fiber
 - Orange Fiber
 - Green Fiber
 - Brown Fiber
 - Slate Fiber
 - White Fiber

Buttons: New, OK, Edit, Cancel, Delete, Update, Clone, Expand, Collapse

Fiber Name: Line 97-Conduit 1-White Duct-Cable 2 (Multi-Mode)-Orange Buffer Tube-Orange Fiber

ITS Analysis

Analysis

ITS Configuration

Edit Domain Set Case Set Mode Settings About

Layers

- topology
- ITS Fiber Connections**

ITS Fiber Connections

At Node: 87 Splice

Connection: Splice CCTV

From Fiber: Line 135-Conduit 1-White Duct-Cable 1-Blue Buffer Tube-Blue Fiber

To Fiber: Line 132-Conduit 1-White Duct-Cable 1 (Single-Mode)-Green Buffer Tube-Blue Fiber

From Fiber Tree

- Line 135
 - Conduit 1
 - White Duct
 - Cable 1
 - Blue Buffer Tube
 - Blue Fiber
 - Orange Fiber
 - Green Fiber
 - Brown Fiber
 - Slate Fiber
 - White Fiber

Connection: CCTV

To Fiber Tree

- Green Buffer Tube
 - Blue Fiber
 - Orange Fiber
 - Green Fiber
 - Brown Fiber
 - Slate Fiber
 - White Fiber
 - Red Fiber
 - Black Fiber
 - Yellow Fiber
 - Violet Fiber

Buttons: OK, Delete All, Add New Connection, Express Connections

ITS Analysis

Analysis

Double-click to select fiber

Layers

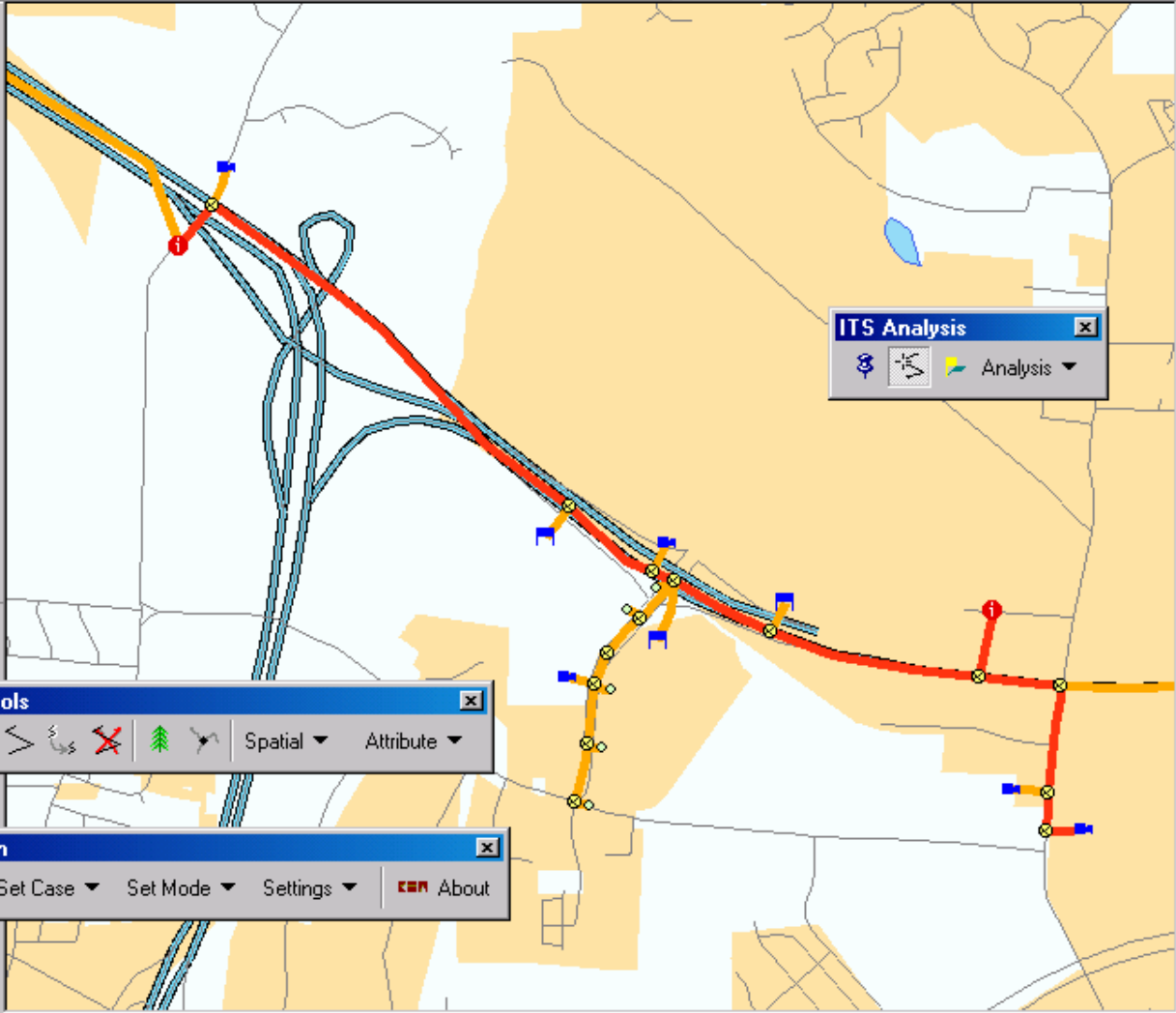
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ITS Editing Tools

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 Spatial ▾ Attribute ▾

ITS Configuration

Edit Domain ▾ Set Case ▾ Set Mode ▾ Settings ▾ 🔴 About



ITS Analysis

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 Analysis ▾

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Question and Answer

