Wireless Networks to Communicate with ITS Devices
InLine Company Overview

Who is InLine
- 20+ Year Old Technology Integrator and Communication Carrier
- 150+ Employees and Growing
- 500+ Contractor Partner Team Members

Company History:
- 1991 Established Integration Services for Business and Government
- 1994 Established ISP Services
- 1995Established Wireless Internet and WAN Services
- 1996 Licensed CLEC
- 1998 Established Fiber Construction Services
- 1998 Constructed first Fiber WAN Networks
- 1999 Established Montgomery, AL Office
- 2001 Established Jackson, MS Office
- 2002 Constructed Jefferson Davis Countywide Wireless Education Network
- 2003 Constructed Murfreesboro, TN Citywide Wireless Municipal Network
- 2005 ALDOT I-65/I-85 ITS Hurricane Evacuation Network
- 2006 Deployed Murfreesboro’s Municipal Mobile Broadband Network
- 2007 Constructed MDOT’s “Rebuilding the Coast” Hwy 90 ITS Network
- 2008 Part of MDOT’s ITS America Award Winning Team
- 2010 Awarded $42M BTOP Grant for Broadband Stimulus Network
- 2011 Licensed Electrical Contractor
Intelligent Transportation System Advantages

- Automated Traffic Management Systems;
- Real-time Traffic Monitoring & Management;
- Real-time Incident Monitoring & Management;
- Real-time CCTV Camera monitoring;
- Vehicle Detection monitoring;
- Weather Sensor Monitoring;
- Public & Agency Notification Systems;
  - DMS, HAR’s, E-mail, & Automated Voice/Text;
  - Automated Maintenance Dispatch

ALL REQUIRE A COMMUNICATIONS NETWORK OF SOME TYPE TO FUNCTION
Infrastructure CHALLENGES

- **Reduced Government Funding**
  - Declining Tax Base;
  - Budget Cuts;
  - ITS & Communication Infrastructure is VERY expensive to deploy;

- **Quickly Moving Technology**
  - Regular Design and Specification Changes, System Upgrades, Product Releases, etc.

- **Quality Assurance**
  - Limited Knowledge & Experience;
  - Lack of Qualified Vendors, Inspectors, and Contractors

- **Long Term ITS Maintenance & Operations**
  - Many Daily Challenges Designing, Building and Sustaining ITS & Communication Infrastructure…
  - Especially for Team’s That Are Already Running VERY Lean!!!
Communication Network Types

- Fiber Networks;
- Microwave Networks;
- Hybrid Networks;
- Mobile Broadband Networks;
- Copper Telco Services;
Wireless Vs. Fiber

Advantage Wireless
- less expensive than fiber
- Usually faster to deploy
- Quicker and easier to modify or upgrade
- Can more efficiently service remote and rural devices
- Less likely to be damaged by backhoes and falling trees

Advantage Fiber
- More reliable
- Less likely to be damaged by lightning
Case Studies –

InLine Example Projects
Murfreesboro Mobile Data Network

Population: 50,000+ Citizens
Number of Users: 1000+
Geographic Size: 35+ Sq. Miles
Complete City Limit to City Limit Mobile Data Coverage

Mobile Data connections up to 3Mbps @ over 60 MPH
Over 70 sq. miles of Mobile Data Coverage using only 6 Tower Sites
Fully Redundant Hybrid Fiber & Wireless Backbone System

Fixed Data connections ranging from 1.5Mbps to 1Gbps

City of MURFREESBORO TENNESSEE

InLine SOLUTIONS THROUGH TECHNOLOGY

http://www.
“InLine’s Mobile Broadband system provides much greater coverage and bandwidth than I ever expected. This enables improved safety, response times and efficiency for our patrol officers and detectives”, stated Bill Terry, IT Director for MPD.
I-65 Hurricane Evacuation Route Network

Real-Time Camera System

Real-Time Traffic Radar Sensor Data

Real-Time Management of I-65 Corridor for Contra-Flow Evacuations

Network stretches 180 miles from Mobile to Montgomery

Provides Emergency VoIP Services between key ALDOT offices

Leased service providing a managed network with total system maintenance

Utilizes both Wireless and Fiber Network Circuits
System Requirements Overview:

- Major Coastal Evacuation Corridor
- 150 Miles of Interstate between Mobile & Montgomery
- Required Monitoring of Key Intersections and Cross-overs
- Major Hurricane’s forced short construction time-line with less than 120 Days to Complete Phase-One.
- Managed Communication Services Includes Fiber, DS3, Microwave, and Wireless Broadband.
- Managed ITS Services included Cameras, RVD’s, and Communication Services
ALDOT Hurricane Evacuation Network
Community Overview

Division 2 Quad City Shoals Area Overview:

- Four Communities acting as one with over 50k population on each side of the TN River.
- Three Major Tennessee River Crossings with average of 25,000 VPD.
- Major Freight and Commuting Corridors.
- Located in Northern Alabama where Road & Bridge Icing is common.
- Roadway, Bridge & De-icing System Monitoring Critical for Public Safety and Traffic Continuity during winter storms.

ALDOT Shoals Area Managed ITS Network
ALDOT Shoals Area Managed ITS Network

Background & Challenges

- Developed Original Plans for 12 mile fiber and ITS network.
- Determined 12 miles would need to be reduced to 6 to stay within $2M budget.
- Found Wireless Solution provides regional coverage that encompasses all of the original 12 miles of Fiber for less than $1m, including 24 months of maintenance.
- Redundant Backbone Design for High Level of Reliability.
- ONLY 3 towers required for Backbone and Distribution.
- Distribution System Provides Community-Wide Broadband access across entire Area with over 350sq miles of 4.9 GHz wireless coverage.
MDOT Hwy 90 “Reconnecting the Coast”
ITS America’s 2008 Best in Show for Innovation Award Winning ITS Network
Two Types of Intersection (Endpoint) Sites

- VL 4.9 GHz SU w/ integrated antenna
- Indoor Unit is simple power brick with (2) ethernet ports – installed inside the traffic box.
- Primary connection system under feasible conditions

- BA 900 MHz Yagi Antenna
- Indoor Unit is a 900 MHz SU-M and is located inside of the traffic box.
- Secondary configuration when conditions do not allow for 4.9 GHz.
Vendor Partners
Feel free to contact me if we can be of any assistance to you!

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Please continue to pray for our troops and calm hurricane seasons!