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
- 1995 Established 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





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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





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Infrastructure CHALLANGES



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



InLine Example Projects



Murfreesboro Mobile Data Network



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





Murfreesboro - Mobile Data Coverage



"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.





Mobile Broadband - Voice, Video, & Data Network



ALDOT Hurricane Evacuation Route



I-65 Hurricane Evacuation Route Network

Real-Time Camera System

EPART

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

HURRICANE EVACUATION ROUTE

INTERSTATE

ALDOT ITS Evacuation Managed Network

System Requirements Overview:

- Major Coastal Evacuation Corridor
- 150 Miles of Interstate between Mobile & Montgomery
- Required Monitoring of Key Intersections and Crossovers
- 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





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ALDOT Shoals Area Managed ITS 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.

ahoto by JS Nature Photos



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.







Highway 90 Broadband Wireless ITS Network



MDOT Backbone Network







MDOT Broadband Coverage

Providing over 2500 sq miles of fixed and nomadic broadband 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



Questions?

Feel free to contact me if we can be of any assistance to you!

Jon Gifford Jon@InLine.com 334-819-1030 Wayne Curry Wcurry@Inline.com 251-518-0113

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





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