ITS Program Update
Moving Towards Implementation of Wireless Connectivity in Surface Transportation

TRB ITS Session
January 26, 2011
Washington, DC
Vision

To research and facilitate a national, **multimodal surface transportation system** that features a connected transportation environment around **vehicles of all types**, the infrastructure, and portable devices to serve the public good by leveraging technology to maximize safety, mobility, and environmental performance.

Plan developed with full participation by all surface transportation modal administrations as well as with significant interaction with multi-modal stakeholders.
ITS Research = Multimodal and Connected

Drivers/Operators

Infrastructure

Vehicles and Fleets

Wireless Devices
“Here I Am” / Where’s My Bus/Carpool?

latitude, longitude, time, heading angle, speed, lateral acceleration, longitudinal acceleration, yaw rate, throttle position, brake status, steering angle, headlight status, wiper status, external temperature, turn signal status, vehicle length, vehicle width, vehicle mass, bumper height

“Here I Am” / What is the Fastest Route to my Delivery Point

“Here I Am” / I am Full

A World With Connected Vehicles and Travelers
ITS Research Program Components

**Applications**
- Safety
  - V2V
  - V2I
  - Safety Pilot
- Mobility
  - Real Time Data Capture & Management
  - Dynamic Mobility Applications
- Environment
  - AERIS
  - Road Weather Applications

**Technology**
- Harmonization of International Standards & Architecture
- Human Factors
- Systems Engineering
- Certification
- Test Environments

**Policy**
- Deployment Scenarios
- Financing & Investment Models
- Operations & Governance
- Institutional Issues
Step One – Accelerate V to V Safety

- Develop a Core Set of Applications
- Conduct Benefits Assessment
- Develop Driver Vehicle Interface Guidelines
- Define Globally Harmonized Standards
- Assess Security Issues
- Accelerate V to V DSRC Devices
  - Basic Safety Message Broadcast Devices (Here I am)
  - Aftermarket Safety Devices
- Prepare for 2013 NHTSA Agency Decision
Step Two - Demonstrate Safety

Safety Pilot

• Major road test and real world implementation taking place 2011 – 2013 involving:
  • Multiple vehicle types
  • Fully integrated systems and aftermarket devices
• Also to test
  • Prototype security mechanisms
  • Certification processes
Safety Pilot continued

• Goals
  • Support real world V2V and V2I applications with a data rich environment
  • Establish benefits data in support of NHTSA 2013 Agency Decision on V2V Communications with Real World Field Data
  • Create Public Awareness & Determine User Acceptance
• Outcomes
  • Benefits and user acceptance data for supporting future federal actions
  • Archived road network data for supporting mobility, environmental, and other industry research
  • Multiple supplier sources for devices and infrastructure (Qualified product Lists for Here I am, Roadside Equipment and Aftermarket Safety)
  • Better understanding of the operational policy issues associated with the deployment of V2V and V2I
Step Three – Define the System and Establish a Testing Environment

User Needs → Concept of Operation → System Requirements → System Architecture


Research Initiatives

Product Concepts

Public / Private Sector Initiatives

Academic Initiatives

Michigan Test Bed

CA Testbed

FL Testbed

NY Testbed

FHWA Turner Fairbank Testbed

Model Deployments

Full Deployment

“In the street – running Jan 2011”
Step Four - Build V to I Safety, Mobility, and AERIS Data Environments and Applications

- **V to I for Safety** – Accelerate Signal Phase and Timing (SPAT) Based Applications, Smart Roadside, and Transit
- **Prototype the Data Environment of the Future** – All Vehicles as Probes and Open Data
- **Prototype, Field Test and Analyze Mobility Applications**
  - Use Open Source Software Approach to accelerate deployment
- **Define and Test AERIS Applications**

Signal Systems
Transit Management
Freight
R.E.S.C.U.E.M.E
ATIS
Speed Harmonization
Step Five – Build a Reference Implementation

- Reflect the System Architecture
- Utilize Harmonized International Standards
- Implement a Certification Process
- Implement a Governance Process
- Implement a Security Process
Step Six - Conduct Regional Pilots

- Multiple Implementation Areas
- Opportunity to Pilot a variety of applications per area’s need (Sites choose from a suite of field tested applications)
- Seeds Implementation
- Uses Lessons Learned from Safety Pilot
- Builds on a Stakeholder Defined Architecture
- Accelerates DSRC for Safety
- Leverages Available Wireless Communications for Mobility and Environment Applications
- Leverages Private Sector Investments Occurring Now
## Major Milestones

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### SAFETY
- **Safety V2V**
  - Safety Workshop
  - V to V Apps
  - V2V NHTSA Agency Decision
- **Safety Pilot**
  - Safety Pilot
  - Safety Benefits Assessment Completed
- **Safety V2I**
  - Safety Pilot
  - V2V NHTSA Agency Decision

### MOBILITY
- **Data Capture**
  - Mobility and Environment Workshop
  - High-Priority Mobility Apps Announced
  - Data Environments
  - Mobility Benefits
- **Dynamic Mobility Apps.**
  - Apps Develop
  - Initial V to I Apps
  - Aftermarket V to I Apps

### TECH
- **Testbed**
  - Testbed Launch
  - Revised Architecture Released
  - Upgraded Testbed Launch
- **AERIS**
  - High-Priority AERIS Applications Selected
  - AERIS Benefit
- **Certification Governance**
  - Prototype Certification Process
  - Prototype Governance Structure
For More Information

www.ITS.DOT.GOV

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