Transforming Transportation through Technology

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ITS Research = Multimodal and Connected

Vehicles and Fleets

Drivers/Operators

Maritime

Wireless Devices

Infrastructure

Rail
Imagine! Connected Transportation
ITS Strategic Research Plan 2010-2014
Multimodal and Connected

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 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 V2V and V2I applications development and testing
  • Obtain benefits data to support NHTSA 2013 agency decision on V2V communications
  • Create public awareness & determine user acceptance

• Outcomes
  • Benefits and user acceptance data
  • 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
Progress - Step Three – Define the System and Establish a Testing Environment

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


Open Workshops
June 2011 (DC)
Sep (San Jose, CA)

connected vehicle environment
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
Mobility Program

Real-time Data Capture and Management

- Vehicle Status Data
- Infrastructure Status Data
- Weather Data
- Truck Data
- Transit Data
- Location Data

Data Environment

Mobility Applications

- Reduce Speed 35 MPH
- Transit Signal Priority
- Weather Application
- Real-Time Travel Info
- Fleet Management/Dynamic Route Guidance
- Signal Phase & Timing Adjusts
- Real-Time Conditions
- Safety Alerts and Warnings
Progress Step Five – Build a Reference Implementation

2011
- Testbed is Up and Running. Interoperable equipment in California, Florida, New York, Michigan, Virginia, and Network Operations in Tennessee

2012 to 2013
- Reflect the System Architecture
- Utilize Harmonized International Standards
- Implement a Certification Process
- Implement a Governance Process
- Implement a Security Process
Progress Step Six - Conduct Regional Pilots

Started Planning and Discussing the Theme with Stakeholders

- 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 Workshop
- Qualified Product Lists (QPLs)
- V to V Apps
- V2I Apps Defined
- Initial V to I Apps
- Safety Benefits Assessment Completed
- Mobility Benefits
- Upgraded Testbed Launch
- Revised Architecture Released
- Prototype Security Process
- Prototype Certification Process
- Prototype Governance Structure

U.S. Department of Transportation
Accelerating Deployment

Research

Technology Transfer

Deployment
Accelerating Deployment

Intelligent Transportation Systems

Modal Administrations

Research

Technology Transfer

Deployment

ITS Joint Program Office, RITA
Accelerating Deployment

- Applied research
  - Integrated Corridor Management
  - Mobility Services for All Americans
  - Electronic Freight Management
- ITS Deployment Tracking
  - 2010 Survey Complete
- Nationwide 511
- ITS Standards for Highway & Transit
- Collaboration among transportation agencies and industry
- Modal leadership
ITS Professional Capacity Building

Reached 2,500 transportation professionals in 2010

- Workforce Development a Priority for DOT
  - PCB Strategic Plan Development
    - http://itspcbplan.ideascale.com/
  - ITS Standards Training
    - 18 Modules under development
- Continuing Education
  - T3s: Talking Transportation & Technology
  - Peer-to-Peer (P2P) Technical Assistance Program
  - Classroom based Training
  - Web based Training
- Workshops and Presentations
- Embedding technology transfer in research process

[Image: Training On-Line Web-Based Transportation Courses]