Connected Vehicle Safety Research & Safety Pilot

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ITS Research = Multimodal and Connected

Drivers/Operators

Vehicles and Fleets

Connectivity

Infrastructure

Wireless Devices
The Connected Vehicle Program

• Vehicle-to-vehicle (V2V) and vehicle-to-infrastructure (V2I) wireless communications for:
  ➢ Crash prevention
  ➢ Improved mobility
  ➢ Environmental sustainability

• Connected vehicle capability addresses over 80% of unimpaired crash scenarios

• Encompasses autos, buses, and trucks
  ➢ Partnership among RITA, NHTSA, FHWA, FMCSA, FTA, and FRA
The Connected Vehicle Program (cont.)

• Uses wireless communications
  □ Dedicated short-range communications (DSRC) technology using FCC-dedicated spectrum that is essential for safety applications
  □ Other communications media for non-safety applications

• Research is maturing such that NHTSA has committed to an agency decision regarding whether the safety technology is sufficiently developed to support rulemaking
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
Key Program Objectives

- 2013 Decision on Vehicle Communications for Safety (light vehicles)
- 2014 Decision on Vehicle Communications for Safety (heavy vehicles)
- 2015 Infrastructure Implementation Guidance
NHTSA Agency Decision

- Possible decision options include:
  - Rulemaking on minimum performance requirements for vehicle communications for safety on new vehicles
  - Inclusion in NHTSA’s New Car Assessment Program to give car makers credit for voluntary inclusion of safety capability in new vehicles
  - More research required
The Vehicle That Doesn’t Crash

Benefits of DSRC technology:

- Price
- False Alarms
  - Delayed Warnings
- Crash Scenarios
NHTSA Agency Decision (cont.)

- Data will determine NHTSA’s action for the 2013 decision point:
  - Simulation and modeling efforts based upon previous field operational tests
  - Data collection from V2V test track testing
  - Empirical data obtained from Safety Pilot
    - Driver clinics (user acceptance)
    - Model deployment activities (safety effectiveness)
- A key factor for the NHTSA decision will be the need for, and timing of, necessary infrastructure for communication security (still undefined)
Safety Pilot Objectives

- Generate empirical data for supporting 2013 and 2014 decisions
- Show capability of V2V and V2I applications in a real-world operating environment using multiple vehicle types
- Determine driver acceptance of vehicle-based safety warning systems
Safety Pilot Objectives (cont)

- Assess options for accelerating the safety benefits through aftermarket and retrofit safety devices
- Extend the performance testing of the DSRC technology
- Collect lots of data and make it available for industry-wide use
- Let others leverage the live operating environment
Safety Pilot Sites

- Driver clinics
  - Assess user acceptance

- Large-scale model deployment
  - Obtain empirical safety data for estimating safety benefits

Six Driver Clinic Sites

One Model Deployment Site
User Acceptance -- Driver Clinics

- 6 locations across the U.S. beginning in August 2011
- 100 drivers per location
- Experience crash warnings
  - Forward Crash Warning
  - Emergency Brake Light
  - Blind Spot Warning
  - Lane Change Warning
  - Intersection Assist
  - Do Not Pass Warning
Model Deployment

- Major road test and real-world implementation taking place from 2011 thru 2013, involving:
  - Approximately 3,000 vehicles
  - Multiple vehicle types
  - Fully integrated systems and aftermarket devices
  - Roadside infrastructure
  - System-wide interoperability testing
- Also to test
  - Prototype security mechanisms
  - Device certification processes
Deployment Scenarios for Security

- **V2V Security Network Options:**
  - DSRC for security: Estimated at 40,000 RSEs; not necessarily owned/operated by Federal/State/local governments
  - Cellular or WiFi: Infrastructure exists; must address privacy
  - No infrastructure: Currently being defined

- No easy option

- All require a sustainable funding stream and governance structure

  - *All options being examined as part of model deployment*
Connected Transportation
For More Information

www.its.dot.gov