IntelliDrive Safety Program Overview

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The Problem!!!

Safety
• 33,963 deaths/year (2009)
• 5,800,000 crashes/year
• Leading cause of death for ages 4 to 34

Mobility
• 4.2 billion hours of travel delay
• $78 billion cost of urban congestion

Environment
• 2.9 billion gallons of wasted fuel
IntelliDrive Program Structure

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

U.S. Department of Transportation
Major IntelliDrive Objectives

• Move aggressively on vehicle to vehicle communications
  • Regulatory Decision on In-Vehicle Equipment by 2013
• Accelerate in-vehicle technology
  • “Here I Am” messages
  • Enables safety and active traffic management
• Accelerate infrastructure communications capability
  • Signal Phase and Timing (SPaT) as initial focus
  • Enables safety, mobility, and environmental applications
• On road multi-modal pilot deployments for high-value applications
• Monitor and evaluation of driver distraction issues
• Understand benefits and communications needs (DSRC/other) of transformative mobility applications
Evolution of IntelliDrive Deployment

Original VII Deployment Model
- DSRC based for all applications
  - Infrastructure intensive using new DSRC technology
  - Vehicle turnover for embedded DSRC technology
- Start with V2I (for all application types) and evolve into V2V (safety)

US DOT’s Current Perspective on IntelliDrive Deployment
- Non-safety (mobility, environment)
  - Leverage existing data sources & communications; include DSRC as it becomes available
  - Support development of key applications for public agencies using current data sources and evolving probe data from IntelliDrive
- Safety → DSRC
  - Aggressively pursue V2V; leverage vehicle capability for V2I spot safety
  - Can leveraging of nomadic devices & retrofitting accelerate benefits?
  - Infrastructure requirement for security is still a TBD
Opportunity for Safer Driving

- **Greater situational awareness**
  - Your vehicle can “see” nearby vehicles and knows roadway conditions you can’t see

- **Reduce or even eliminate crashes thru:**
  - Driver Advisories
  - Driver Warnings
  - Vehicle Control

*IntelliDrive has the potential to address 82% of the vehicle crash scenarios involving unimpaired drivers*
Key Elements of the IntelliDrive Safety Program

- DSRC for low latency needs
- OEM, retrofit, aftermarket device scenarios being considered for deployment
- All vehicle types being examined for value added applications
- Programs are structured towards achieving deployment
- Establishing national level interoperability → Open standards for communications and data
- Introduction of new systems/devices must consider driver distraction safety issues
- Ensure adequate levels of security
- Reasonably protect personal privacy
- Activities supportive of mobility and convenience applications
## IntelliDrive Safety Program Areas

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<th>Initiative</th>
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| Vehicle-to-Vehicle               | ▪ Support NHTSA regulatory decision for 2013  
▪ Could cover NEW cars, trucks, and buses                                                                                                  |
| Safety Pilot                     | ▪ Ensure technical and institutional viability through real-world deployment testing.  
▪ Accelerate in-vehicle technology to ensure value to the first V2V deployed vehicles                                                      |
| Vehicle-to-Infrastructure        | Enable active safety applications to assist vehicle operators (including cars, trucks, and buses) and pedestrians to avoid or mitigate crashes. |
| Policy                           | Develop policy options and actionable recommendations for privacy, security, governance and other issues                                   |
| Certification                    | Establish certification framework for ensuring that DSRC devices/interfaces are compliant with industry standards for communications and data messaging. |
| Human Factors for IntelliDrive   | Eliminate distractions related to ITS devices as a contributing factor to crashes.                                                        |
| International Harmonization      | Develop internationally harmonized standards, particularly around vehicle-based applications                                           |
Safety Program Provides Cross-cutting Support

- **Safety**
  - V2V
  - Data Security Framework
- **Mobility**
  - Dynamic Mobility Applications
  - AERIS
- **Environment**
  - AERIS

- **Safety Pilot**
  - V2I
  - Infrastructure Communications
    - (SPaT, Positioning, Mapping)
  - Road Network Data
    - (“Here I Am” and SPaT)
  - Real Time Data Capture & Management
  - Independent Industry Application Development
  - AERIS
Technical and Policy Interactions

(For Example: Security vs Privacy Trade-offs)

- Policy trade-offs will require senior level decisions.
Outstanding Technical Issues

• Penetration vs. Effectiveness
• Driver Acceptance
• Data Security
• Positioning
• Scalability
• Channel Switching

• Being addressed under current CAMP activities
• Establish independent technical peer review
• Safety Pilot to provide real-world deployment for proving out solutions
Outstanding Safety Policy Issues

• How will tradeoffs between security, privacy and functionality be managed?

• Operations
  ▪ Who will monitor for misbehavior?
  ▪ Who will operate the Security Certificate Authority?

• Compliance & Enforcement
  ▪ Who will enforce DSRC standards?
  ▪ How will the rules of operation be developed and enforced?
  ▪ Who and how will DSRC devices be certified?

• Critical V2V and V2I Policy Issues Being Defined
• V2V Policy White Paper /Roadmaps Defined and Being Executed
• Internal and External Stakeholder Engagement Being Defined
Large Scale Multi-Application Pilot

- Establish pilot V2I deployment that includes infrastructure and back office management
- Encompasses all application types
- Includes multiple wireless communication media
- Follow on to current activities in:
  - Systems Engineering
  - SPaT development
  - Standards update
  - Aftermarket device maturity
  - Safety Pilot
- Small prototyping over next 2 years
- Currently under consideration for development
For More Information...

http://www.intellidrive.org/