IntelliDrive℠
Program Overview

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Mobility and Environment Workshop
Arlington, Virginia

November 30, 2010
What is IntelliDrive?

IntelliDrive\textsuperscript{SM} is a suite of technologies and applications that use wireless communications to provide connectivity:

- Among vehicles of all types
- Between vehicles and roadway infrastructure
- Among vehicles, infrastructure and wireless consumer devices

**To Improve Safety, Mobility and Environment**

FCC Allocated Spectrum at 5.9 GHz for Transportation Safety (known as DSRC)
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
  • Aftermarket Safety Systems
  • 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
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

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IntelliDrive Safety Program Areas

Cross-Cutting Areas

- Policy
- Standards / Harmonization
- Security
- Certification

Crash Avoidance Applications
Core Supporting Technologies

V ↔ V

Human Factors

Safe Driver Interfaces

V ↔ I

HIA / Aftermarket

Accelerating Testing & Deployment

Safety Pilot

Deployment
Safety Research Issues

- Penetration vs. Effectiveness
- Driver Acceptance
- Data Security
- Positioning
- Scalability
- Channel Switching
IntelliDrive Mobility

Real-time Data Capture and Management

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

Data Environment

Mobility Applications

- Transit Signal Priority
- Reduce Speed 35 MPH
- Weather Application
- Real-Time Travel Info
- Fleet Management/Dynamic Route Guidance
- Signal Phase & Timing Adjusts Real-Time Conditions
- Safety Alerts and Warnings

U.S. Department of Transportation
AERIS: Research Goal and Objectives

Ultimate “Stretch” Research Goal
Transform environmental management of the transportation system.

Objectives
To investigate whether it is possible and feasible to generate/capture environmentally-relevant real-time transportation data (from vehicles and the system), and use this data to create actionable information that can then be used by system users and operators to support and facilitate “green” transportation choices for all modes.
Assess whether doing these things yields a good enough environmental benefit to justify further investment.
Three general, overarching questions:

**Data**
What environmentally-relevant vehicle-based data is available, and what is its quality and validity? (All types of vehicles)

**Information/Connectivity**
How can vehicle-based data be used and integrated with existing transportation system operation and other data (such as road weather data, for example)?

**Benefit**
What cross-modal public-sector oriented applications/strategies are available, or could be available/developed, and what are their expected benefits?
Leveraging Safety Program Activities to Provide Cross-cutting Support

V2V
- DSRC-based technologies
  - (Data security, scalability, data sets, etc.)

V2I
- Infrastructure Communications
  - (SPaT, Positioning, Mapping, Communications)

Safety Pilot
- Road Network Data
  - (“Here I Am” and SPaT)

V2I
- Dynamic Mobility Applications
- AERIS

Dynamic Mobility Applications
- Real Time Data Capture & Management
  - (database; non-real time)

AERIS
- Dynamic Mobility
- AERIS, Road Weather
- Industry

Live Open Operating Environment

U.S. Department of Transportation
IntelliDrive Systems Engineering

- FCC allocates 5.9 GHz spectrum for DSRC
- Prototypes for Vehicle-to-vehicle (safety applications) and Vehicle-to-Infrastructure (public applications) developed based on DSRC 5.9 GHz and tested in a Proof of Concept test bed
- VII Architecture developed based on Day 1 Use Cases
- "VII" rebranded as "IntelliDrive" to reflect new assumptions
- Stakeholder workshops to solicit user needs
- IntelliDrive SE Program initiated to re-baseline
- Re-baselined IntelliDrive Concept of Operations, Requirements, & Architecture completed

- We are here

Aug./Sept. 2010

Oct. to Dec. 2010

Jan. to March 2011

Summer 2011
IntelliDrive Testbed – Available January, 2011

“In the street – running”

Reference Implementation of IntelliDrive System Architecture - 2012
## Major IntelliDrive℠ Milestones

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Today and Tomorrow: Key Themes

- Tech Neutrality
  - *DSRC and More*
  - Use DSRC where it makes sense, don’t use it where it does not
- Coordinated Research and Development
  - Collect quality data once, develop many applications
  - Safety-Mobility-AERIS
- Transparency and Ongoing Stakeholder Engagement
  - Open Data
  - Open Source Development
- Widely Available Program Products
  - Data and Applications Portal
  - Knowledge Management Portal
For More Information...

http://www.intellidrive.org/