IntelliDrive™ Program Update
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Research and Innovative Technology Administration/ITS Joint Program Office
# IntelliDrive<sup>SM</sup> Program Structure

## Applications

<table>
<thead>
<tr>
<th>Safety</th>
<th>Mobility</th>
<th>Environment</th>
</tr>
</thead>
<tbody>
<tr>
<td>V2V</td>
<td>Real Time Data Capture &amp; Management</td>
<td>AERIS</td>
</tr>
<tr>
<td>V2I</td>
<td>Dynamic Mobility Applications</td>
<td>Road Weather Applications</td>
</tr>
<tr>
<td>Safety Pilot</td>
<td></td>
<td></td>
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</tbody>
</table>

## Technology

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

## Policy

- Deployment Scenarios
- Financing & Investment Models
- Operations & Governance
- Institutional Issues

IntelliDrive<sup>SM</sup> is a registered service mark of the 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
  • 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
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
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
- Protect personal privacy
- Activities supportive of mobility and convenience applications
## IntelliDrive Safety Program Areas

<table>
<thead>
<tr>
<th>Initiative</th>
<th>Objectives</th>
</tr>
</thead>
</table>
| 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                                              |
IntelliDrive Mobility

Real-time Data Capture and Management

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

Mobility and Environmental 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
IntelliDrive Real Time Data Capture and Management

Vision
• Active acquisition and systematic provision of integrated, multi-source data to enhance current operational practices and transform future surface transportation systems management

Objectives
• Enable systematic data capture from connected vehicles (automobiles, transit, trucks), mobile devices, and infrastructure
• Develop data environments that enable integration of data from multiple sources for use in transportation management and performance measurement
• Reduce costs of data management and eliminate technical and institutional barriers to the capture, management, and sharing of data
IntelliDrive Dynamic Mobility Applications

Vision
• Expedite development, testing, commercialization, and deployment of innovative mobility applications:
  ▪ maximize system productivity
  ▪ enhance mobility of individuals within the system

Objectives
• Create applications using frequently collected and rapidly disseminated multi-source data from connected travelers, vehicles (automobiles, transit, freight) and infrastructure
• Develop and assess applications showing potential to improve nature, accuracy, precision and/or speed of dynamic decision making by system managers and system users
• Demonstrate promising applications predicted to significantly improve capability of transportation system to provide safe, reliable, and secure movement of goods and people
Key Elements of the IntelliDrive Mobility Program

• Facilitate easy, secure access to data environments
  • Prototype Data Environment, https://datacapture.noblis.org/
  • FY 11 will obtain sample data environments
• Open Source Application Development that enables collaboration in mobility application development
  • Prototype Application Template, www.its.dot.gov/intellidrive/app_template/DMA_template.htm
  • 49 application ideas submitted by Aug. 31
  • Application Ideas due October 15, 2010
  • FY 11 will start developing applications
• Accumulate and share intellectual capital while respecting Intellectual Property rights
• Coordination with other IntelliDrive program areas and broader ITS programs
Leveraging Safety Program Activities to Provide Cross-cutting Support

- **Safety**
  - **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
  - Real Time Data Capture & Management
    (database; non-real time)
  - 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
- VII Architecture developed based on Day 1 Use Cases
- 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" rebranded as "IntelliDrive" to reflect new assumptions
- Stakeholder workshops to solicit user needs
- IntelliDrive SE Program initiated to re-baseline
- Re-baselining IntelliDrive Concept of Operations, Requirements, & Architecture completed

Timeline:
- 2004
- 2005
- 2006
- 2008
- 2009
- 2010

- 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 Upcoming Milestones/Events

- September 29 and 30, IntelliDrive Systems Engineering Workshop, Washington, DC
- November/December, 2010 – IntelliDrive Draft Concept of Operations available for Public Review and Comment
- December 1 and 2, 2010 – IntelliDrive Mobility Workshop, Washington, DC
- January, 2011 – Announce Priority Safety and Mobility Applications for Development
- January 2011 – IntelliDrive Testbed Operator Transition Complete and Available for Stakeholder Use
For More Information…

http://www.intellidrive.org/