Road Vehicle Automation: 
Development of a US DOT Multimodal Program Plan

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The Problems!!

Safety
- 32,367 highway deaths in 2011
- 5.3 million crashes/year
- Leading cause of death for ages 4, 11-27

Mobility
- 4.8 billion hours of travel delay
- $101 billion cost of urban congestion

Environmental
- 1.9 billion gallons of wasted fuel
- Cars and trucks generate 22% of all CO₂ emissions
Benefits of Vehicle Automation

Vehicle automation has the potential to address major problems impacting the US transportation system

Safety
- Prevent crashes
- Reduce severity of crashes

Mobility
- Reduce individual delay
- Improve personal mobility
- Improve network operations

Environmental
- Reduce fuel consumption
- Reduce emissions
Current State of the Industry

- Enabling Technologies – Many Developed/Validated
  - Examples include: Radar, Steer-by-wire, GPS
  - Components of automation systems

- Automation Systems – At Various Levels of Development
  - Currently: Adaptive Cruise Control, Lane Departure Prevention, Crash Imminent Braking
  - Under Development: Emergency Stop Assist, Lane Change Assist

- Government’s Role
  - Accelerate societal benefits
  - Minimize societal risk

Images Source: Continental Automotive Group
Vehicle Automation Development
- Can proceed independently of connectivity to a point
- Greatly enhanced with connectivity to other vehicles and infrastructure

Benefits of Connectivity
- Increases availability, speed, and reliability of information
- Enables coordination of automated traffic streams

The full potential benefits of road vehicle automation can only be achieved through a connected environment.
Vehicle Automation Program Plan

Project Goal
- Develop a multi-modal research plan to focus on accelerating public benefits and reducing public risk

Project Scope
- Define Automation Levels, Identify Benefit Opportunities and Identify Prototype Use Cases
- Research and Analysis of Issues and Challenges
- Development of Multimodal Automated Vehicle Program Plan

- Project Schedule
  - Preliminary draft by summer 2013
Process for Developing Program Plan

- **Collaboration within US DOT**
  - ITS JPO, FHWA, FTA, NHTSA, FMCSA, Volpe

- **Collaboration with external stakeholders**
  - International groups
  - Vehicle manufacturers and suppliers
  - State and local government agencies
  - Standards organizations
  - Advocacy groups
  - Academia / Independent Research Organizations

Extensive outreach efforts taking place over the next few months to obtain stakeholder input.
Foundation – Automation Levels

- Automation at the vehicle and infrastructure level is necessary to achieve full potential of the system
- Automation level increases with vehicle & infrastructure level
- Foundation for describing the operational scenarios
Research into Issues and Challenges

- Categorization of Issues and Challenges
  - Identified during TRB 2012 Summer Working Meeting
  - Divided into Technical and Non-technical categories

<table>
<thead>
<tr>
<th>Technical Issues</th>
<th>Non-technical Issues</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vehicle</td>
<td>Public Policy</td>
</tr>
<tr>
<td>Roadway</td>
<td>Market Evolution</td>
</tr>
<tr>
<td>Communications</td>
<td>Legal / Liability</td>
</tr>
<tr>
<td>Architecture</td>
<td>Consumer Acceptance</td>
</tr>
<tr>
<td>Cybersecurity</td>
<td>Cost-Benefit Analysis</td>
</tr>
<tr>
<td>Safety Reliability</td>
<td>Human Factors</td>
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<td>Human Factors</td>
<td>Certification</td>
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<tr>
<td>Operations</td>
<td>Licensing</td>
</tr>
</tbody>
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Feedback Loop
Structure of Program Plan

- Describe Vision and Long-term Objectives of Program
- Identify Operational Scenarios & Use Cases
  - Platooning
  - Intersection Management
  - Emergency Stop Assistant
  - Speed Harmonization
  - First/Last Mile
  - Off-Road Applications
- Characterize Cross-Cutting Issues
  - Technical
  - Non-technical
- Develop Recommendations for Future Research Efforts
  - Classify into near-term and mid-term research opportunities
  - Prioritize based on all available information and perceived value of research
Next Steps

- Stakeholder Interviews – Spring 2013
- Preliminary Draft – Summer 2013
- Additional Stakeholder Feedback – Summer/Fall 2013
- ITS Strategic Planning Process for 2015-2019
  - Vehicle Automation Program Plan will provide input into process
Vehicle & infrastructure automation, along with connectivity is the next major step in developing a safer, more efficient surface transportation system.

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