USDOT Activities in Automation

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SIS49: National Road Authorities Strategies to Support the Development towards Automation
Federal Policy

• NHTSA released a *Preliminary Statement of Policy Concerning Automated Vehicles* representing recommended principles for states to consider in developing legislation and regulations pertaining to automated vehicles.

• In general, NHTSA advises states to avoid stifling innovation through premature regulations but urges restraint in authorizing the operation of self-driving vehicles for non-testing purposes until the technology reaches a higher level of sophistication.
Automation Offers the Potential to Address Our Nation’s Transportation Problems

- **Improving safety**
  - Reduce and mitigate crashes

- **Increasing mobility and accessibility**
  - Expand capacity of roadway infrastructure
  - Enhance traffic flow dynamics
  - More personal mobility options for disabled and aging population

- **Reducing energy use and emissions**
  - Aerodynamic “drafting”
  - Improve traffic flow dynamics

...but connectivity is critical to achieving the greatest benefits
Connected Automation for Greatest Benefits

**Autonomous Vehicle**
Operates in isolation from other vehicles using internal sensors

**Connected Vehicle**
Communicates with nearby vehicles and infrastructure

**Connected Automated Vehicle**
Leverages autonomous and connected vehicle capabilities
Emerging Technical and Policy Considerations

• Complexity of testing, certifying and assuring the safety of the technology

• Data privacy concerns and implications for public agencies

• Addressing role of road owners, operators and infrastructure providers to enable AVs

• Impacts of AVs on infrastructure, planning and the overall transportation system

• Challenges of varying state regulations and need for greater consistency

• Human factors issues and driver transitions
Program Goal:
Enable safe, efficient, and equitable integration of automation into the transportation system
USDOT Automation Program is Led Through Multi-Modal Coordination

The ITS JPO is responsible for coordinating the ITS program and initiatives among the following DOT offices:

- Federal Highway Administration (FHWA)
- Federal Motor Carrier Safety Administration (FMCSA)
- Federal Transit Administration (FTA)
- Federal Railroad Administration (FRA)
- National Highway Traffic Safety Administration (NHTSA)
- Maritime Administration (MARAD)
# U.S. DOT Automation Program

## Research Tracks

### Enabling Technologies
- Digital Infrastructure
- Communications
- Technology Research

### Safety Assurance
- Electronic Control Systems
- Functional Safety and Electronics Reliability
- Cybersecurity
- Human Factors

### Transportation System Performance
- CACC, Speed Harmonization, and Platooning
- Lateral Control
- First/Last Mile and Transit Operations

### Testing and Evaluation
- Interoperability
- Testing Methods
- Benefits Assessment

### Policy and Planning
- Standards
- Federal Policy Analysis
- Stakeholder Engagement
- Transportation Planning

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**TOWARDS INTELLIGENT MOBILITY**

Better use of space
Enabling Technologies

POSITION, NAV & TIMING

MAPPING

SENSORS

COMMUNICATIONS

HUMAN FACTORS

Towards Intelligent Mobility
Better use of space
Benefits Evaluation Framework

Scenario: Safety
- Baseline
  - Vehicle0
  - VehControl0
  - Driver0
- Automation
  - Vehicle1
  - VehControl1
  - Driver1

Scenario: Mobility
- Baseline and Automation
  - Driving cycle
  - Car following
  - Intersection performance
  - Link performance

Crash Databases

Possible interactions

Safety Model

Safety Benefits

Transport network
- Desired travel

Regional transportation model
- Changes in transportation system usage

Energy/Environmental model
- Energy/Env. Benefits

Analysis: Mobility
- Mobility Benefits

Analysis: Accessibility
- Accessibility Benefits

Analysis: Land Use
- Land Use Benefits

Economic Analysis
- Economic Benefits

TOWARDS INTELLIGENT MOBILITY
Better use of space
Review of Federal Motor Vehicle Safety Standards

How could highly automated vehicles impact or change the nature of existing Federal Motor Vehicle Safety Standards (FMVSS)?

• Identifying where current FMVSS pose challenges to introduction of AVs – particularly as they move into concepts of ‘human out of the loop’ or ‘driverless’

• Ensuring that existing Federal regulations do not stifle innovation and that AVs are performing their functions safely

• NHTSA and ITS JPO coordinated research

# DRAFT Automation Policy Research Roadmap

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<th>Regulatory Environment</th>
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<td>Evaluating Safety Standards and Certification Processes for AV</td>
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<td>ITS and AV State Legislative Scan and Analysis</td>
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<td>Analyzing Impacts of AV on FMCSA Regulations and Enforcement</td>
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<th>Data Privacy and Management</th>
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<td>Understanding AV Consumer Acceptance and Education Challenges</td>
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<td>Impacts of AV on the Long Range Transportation Planning Process</td>
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<td>Impacts of AV on Land Use and its Policies</td>
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**Stakeholder Outreach**

**Towards Intelligent Mobility**

Better use of space
U.S. DOT Stakeholder Engagement

- Automated Vehicle Symposium
- U.S. DOT State Roundtable on Automated Vehicles
  - State DOTs and DMVs
- Webinars
  - ITS JPO and ITS America Webinar: Fundamental Issues for Road Transport Automation
- Coordinating research efforts
  - Tri-lateral Working Group on Automation in Road Transport
Collaboration and information sharing will be key.

Stakeholder engagement is critical for understanding research needs.

Looking to better understand benefits and implications of technology.

Guidance and policies will be important in achieving highest possible benefits.

Looking Ahead