U.S. DOT Automation Program

TRB Session 412

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Automation in Transportation
Looking Ahead

- Full automation has the potential to revolutionize the transportation system but requires careful study.
- Partial automation will likely provide significant transportation system benefits.
- Connectivity is critical to safe and efficient operations.
Potential Automation Impacts

- **Positive Impacts**
  - Crash avoidance
  - Reduced congestion
  - Reduced energy consumption and vehicle emissions
  - Improved travel time reliability and multi-modal connectivity
  - Improved personal mobility for the disabled and aging population

- **Uncertain Impacts**
  - Network effects
  - Distribution of benefits
  - VMT changes
  - Land use patterns
  - New crash scenarios
  - Vehicle ownership models
Challenges for Automation

- **Technical Challenges**
  - Transfer of control between driver and vehicle
  - Safe reliability
  - Cybersecurity
  - Testing and certification of automated vehicles
  - Mixed modal operations

- **Policy Challenges**
  - Harmonized state regulatory frameworks
  - Data ownership and privacy
  - Evaluation of societal and operational impact
  - Standards and interoperability
  - Digital infrastructure
ITS Strategic Plan’s Framework

TWO PROGRAM PRIORITIES
Realizing Connected Vehicle Implementation and Advancing Automation

FIVE STRATEGIC THEMES

SIX PROGRAM CATEGORIES

RESEARCH
Goals

DEVELOPMENT
Goals

ADOPTION
Goals
Enable safe, efficient, and equitable integration of automation into the transportation system
Objectives

1. Facilitate development and deployment of connected automated transportation systems that enhance safety, mobility, and sustainability
2. Assess implications of emerging enabling technologies
3. Research transportation system-level operational impacts of automation applications
4. Assess the need for new vehicle performance guidelines and requirements
5. Develop stakeholder guidance for automated vehicle operations
6. Develop appropriate testing methods and objective test procedures
7. Estimate the potential safety, mobility, energy, and environmental benefits of automation technologies
8. Identify and address policy, institutional, and regulatory challenges to safe automated vehicle operations
Research Tracks

Enabling Technologies

| Digital Infrastructure | Communications | Technology Research |

Safety Assurance

| Electronic Control Systems | Software Assurance and 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 |
# New U.S. DOT Automation Research Projects

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<td>Functional Testing of AV Systems</td>
<td>Assessment of Digital Infrastructure for Automation</td>
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<td>Standards Planning for Automation</td>
<td>Extension of Cybersecurity Guidelines to AV</td>
<td>Cooperative Adaptive Cruise Control – Enabling Research</td>
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<td>Stakeholder Engagement</td>
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For More Information

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