Idaho Autonomous Vehicle And Connected Vehicle Testing and Deployment Committee
Welcome!

Brian Ness
Director, Idaho Transportation Department
• **Due to Governor’s Office:** November 1, 2018

• **Committee Meetings:** May, August, and October
  — Then as required
The state of Idaho embraces the testing and development of advanced transportation technology.
• Find out who has jurisdiction
• Coordinate road tests
• Identify legal impediments
• Identify and Leverage strategic Partnerships
Focus Areas

- Policy Considerations
- Infrastructure
- Security and Privacy
- Testing and Deployment
Committee Focus

Idaho:
Autonomous and Connected Vehicles

AASHTO:
Cooperative Automated Transportation (CAT)
Overview

• Terminology
• Automation Levels
• Federal and State Activities
• Idaho Actions and Projects
Terminology

- **Automated Driving Systems (ADS)**
  - Automated Vehicles (AV)
  - Connected Vehicles (CV)
  - Autonomous vs Automated
  - Cooperative Automated Transportation (CAT)
  - Dynamic Driving Task

- **Communications**
  - Dedicated Short Range Communications (DSRC)
  - 5G and 6G Wi-Fi Development
  - Vehicle-to-Vehicle (V2V)
  - Vehicle-to-Infrastructure (V2I)
  - Vehicle-to- “Other” (V2X)
Terminology

Society of Automotive Engineers (SAE) Automation Levels

0  No Automation  
Zero autonomy; the driver performs all driving tasks.

1  Driver Assistance  
Vehicle is controlled by the driver, but some driving assist features may be included in the vehicle design.

2  Partial Automation  
Vehicle has combined automated functions, like acceleration and steering, but the driver must remain engaged with the driving task and monitor the environment at all times.

3  Conditional Automation  
Driver is a necessity, but is not required to monitor the environment. The driver must be ready to take control of the vehicle at all times with notice.

4  High Automation  
The vehicle is capable of performing all driving functions under certain conditions. The driver may have the option to control the vehicle.

5  Full Automation  
The vehicle is capable of performing all driving functions under all conditions. The driver may have the option to control the vehicle.
Federal Activity

• **Federal Legislative Progress:**
  • Provides federal language for implementing AV use (AV START Act - Senate, SELF DRIVE Act - House)
  • Bills to preempt states from adopting, maintaining, or enforcing rules or standards to the contrary
  • Provides that a state may not deny issuance of a driver license for the operation or use of a dedicated highly automated vehicle in a manner that discriminates on the basis of disability
  • Provides limits on number of AVs manufactured annually

• **US DOT:**
  • Voluntary guidance - 12 priority safety design elements
  • Executed through NHTSA as recommendations; Sept. 2017
  • Limited to vehicles 10,000 pounds or less
  • NHTSA will be required to publish and finalize rules based on bill final language
State Activity

• 2015 Session
  • Bill considered to encourage testing – No consensus on liability levels
  • Required human operator be present in test vehicles with ability to take control
  • Required vehicles meet current federal safety standards
  • Allowed local jurisdiction to close roads to testing
  • Narrowly passed Senate, Failed in House

• 2017 Session
  • Information panel (DMV, Utah DOT, Idaho State Police, Manufacturer Representative, and two legislators)
    ▪ Provided information on current status of AV’s

• 2018 Governor’s Executive Order
Idaho Actions

• Idaho Transportation Department Activity
  • Economic Opportunity and Mobility Strategic Team
  • Long Range Transportation Plan
  • Infrastructure Project Development

• Projects in Idaho
  • Idaho Transportation Department and Idaho National Laboratory
    • Signal in Idaho Falls
    • Camera Feeds to 511
  • Ada County Highway District
    • Advanced Signal Controllers
Idaho Autonomous Vehicle And Connected Vehicle Testing and Deployment Committee

Regional and National Consistency

Dale Higer
Uniform Law Commission, Drafting Committee on Highly Automated Vehicles
FEDERAL ACTION
# Federal and State Regulatory Roles

<table>
<thead>
<tr>
<th>NHTSA'S RESPONSIBILITIES</th>
<th>STATES' RESPONSIBILITIES</th>
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<tbody>
<tr>
<td>• Setting Federal Motor Vehicle Safety Standards (FMVSSs) for new motor vehicles and motor vehicle equipment (with which manufacturers must certify compliance before they sell their vehicles)³³</td>
<td>• Licensing human drivers and registering motor vehicles in their jurisdictions</td>
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<td>• Enforcing compliance with FMVSSs</td>
<td>• Enacting and enforcing traffic laws and regulations</td>
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<td>• Investigating and managing the recall and remedy of noncompliances and safety-related motor vehicle defects nationwide</td>
<td>• Conducting safety inspections, where States choose to do so</td>
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<td>• Communicating with and educating the public about motor vehicle safety issues</td>
<td>• Regulating motor vehicle insurance and liability</td>
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Best Practices for Legislatures

• Provide a “technology-neutral” environment.

• Provide licensing and registration procedures.

• Provide reporting and communications methods for Public Safety Officials.

• Review traffic laws and regulations that may serve as barriers to operation of ADSs.
Federal Legislative Activity

- House Passes Autonomous Vehicle Bill Expanding Federal Pre-emption
  - Expansion of Federal Pre-emption
  - Updating FMVSS
  - FMVSS Exemptions
  - Advisory Council

**H. R. 3388**

AN ACT

To amend title 49, United States Code, regarding the authority of the National Highway Traffic Safety Administration over highly automated vehicles, to provide safety measures for such vehicles, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE; TABLE OF CONTENTS.

(a) SHORT TITLE.—This Act may be cited as the “Safely Ensuring Lives Future Deployment and Research In Vehicle Evolution Act” or the “SELF DRIVE Act”.

(b) TABLE OF CONTENTS.—The table of contents for this Act is as follows:
Federal Legislative Activity

- Senate Releases Bipartisan Autonomous Vehicle Legislation That Pre-empts States
  - Pre-emption
  - Updating FMVSS
  - FMVSS Exemptions
  - Safety Evaluation Report
    - System safety
    - Data recording
    - Cybersecurity
    - Human-machine interface
    - Crashworthiness
    - Documentation of capabilities
Federal Legislative Activity

• Senate Releases Bipartisan Autonomous Vehicle Legislation That Pre-empts States (Continued)
  
  • Post-crash behavior
  • Account for applicable laws
  • Automation function

• Advisory Council

• Traffic Safety and Law Enforcement
State Legislation

States with Enacted Autonomous Vehicle Legislation
State Action

- Nevada
- California
- Arizona
- North Dakota
- Utah
- Michigan
- Colorado
- Hawaii
- Washington
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National Safety Policy

John Tomlinson
Idaho Transportation Department
Federal and State Roles

• National Highway Traffic Safety Administration (NHTSA) Roles

• States’ Responsibilities
Recommendations

Licensing Drivers to Operate Self-Driving Vehicles for Testing

Ensure driver understands how to operate a self-driving vehicle safely
State Regulations Governing Testing of Self-Driving Vehicles

- Minimizes risks to other road users
- Suitable for the capabilities of the tested self-driving vehicles
- Reporting requirements
Recommendations

Basic Principles for Testing Self-Driving Vehicles

• Transitioning process
• Capabilities when system malfunctions
• Does not disable any federally required safety features or systems
Regulations

Governing Operation of Self-Driving Vehicles for Purposes Other than Testing

Not recommended at this time
• Administrative
• Application for manufacturers or other entities to test HAVs on public roadways
• Jurisdictional permission to test
• Testing by the manufacturer or other entity
Model State Policy

- Deployed vehicles: “Drivers”
- Deployed vehicles: Registering and Titling
- Law enforcement considerations
- Liability and insurance
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Liability Considerations

Jeff Marker
Idaho Transportation Department
Liability Considerations

Personal Liability Insurance

- Autonomous vs. Connected Vehicle Technologies
- Connected Vehicle Implications
  - Data on driving habits
- Autonomous Vehicles
  - Benefits – Safety, Mobility, Insurance costs
  - Cost increase due to complexity of vehicle systems
  - Shift in liability
  - Dynamic driving tasks
  - Product liability law determined by state
State Actions

- **AV Laws:**
  - 25 States with legislation (plus D.C.)
  - 8 States with Executive Orders

- **Platooning**
- **Liability Not Addressed**
- **Liability for Original Manufacturer Limited for Third Party Conversions**
  - Michigan – Additionally exempts mechanics/repair shops from liability on fixing AVs
  - Nevada
  - Washington D.C.

- **Tennessee** - Specifies that the ADS shall be considered a driver for liability purposes when it is fully engaged and operated properly.
Liability Considerations

- **AV / CV Systems in Idaho**
  - State Infrastructure Responsibility
    - Build and maintain
    - Infrastructure through third party
      - State must be indemnified, hold harmless
      - Sovereign Immunity
  - Cyber Security
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Policy Focus Area Discussion
Idaho Autonomous Vehicle And Connected Vehicle Testing and Deployment Committee

INFRASTRUCTURE

Ed Bala, PE
District 5 Engineer ITD
Overview

• The Future Will be Here Sooner Than We Think
  • Infrastructure Needs of AV/CV
  • Future Capacity Needs
  • AV Rollout
  • Funding Implications
Infrastructure Needs

Improved Striping/Signs

• Sensors Need to “Find” Clues
Even With Better Marking, Sensors Can Have Problems

- Glare/Rain
- Misidentification
Infrastructure Needs

Carmakers Are Responding to These Problems

- 23+ Sensors – Lidar, Radar, etc
- Highly Accurate 3D Mapping/GPS
- Better AI – Sense/Decide 20x per Second
Infrastructure Needs

More Information is Helpful

• V2I – Audi Pioneering Signal Info
  • Las Vegas
  • Houston
  • Dallas
  • Portland

• Could Share Weather/Road Data
  • ITD RWIS Network- Partner w/INL
  • Bluetooth/Algorithms
  • ??
Difficulties in Sharing Infrastructure Data

- Deployment Not Uniform
- Security Concerns
- Liability Issues
- Technical Issues w/Spectrum Sharing
Future Capacity Needs

- Capacity Inadequate Now
- Computers Make Better/Faster Decisions Than Us
  - 8/8/80 @ Full Autonomy
Future Capacity Needs

AV Will Affect Freeway Capacity

- Saturated at 2000 V/LH With Humans
- Estimated at 4000 V/LH With AI
- No Capacity Benefit Until 75% AV
Humans Also Affect Capacity

- **Millenials**
  - Work where you live

- **Boomers**
  - Retiring – not commuting
Autonomous Vehicle Rollout

Driven by Competing Business Agendas – Not Public Policy
Autonomous Vehicle Rollout

AV Estimated Percentage of Fleet

• Forbes – 25% by 2030
• Victoria Transport Policy Institute – 40% by 2050
• RAND Corporation – 80% by 2060
Factors Affecting Rollout

• Pace of Change Faster Than Ever before
Factors Affecting Rollout

• Technology Revolution—These Didn’t Exist 10 Years Ago
Factors Affecting Rollout

- Insurance and AV/CV
  - RAND Study – Best Benefits From Early Adoption
Funding Implications

- Need Better Infrastructure – ASCE Rates at D+
- Technology/People Will Reduce Demand – But Not Immediately
- Existing Funding Models Not Working
Funding Implications

Infrastructure and Funding Needs

Governor’s Task Force Findings
Annual, Ongoing State / Local Revenue Shortfall
(in millions, as of June 30, 2017)

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<tr>
<td>2014 Cigarette Tax*</td>
<td>$262.0</td>
<td>$281.0</td>
<td>$543.0</td>
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<tr>
<td>2015 Revenue Increase**</td>
<td>$105.6</td>
<td>$4.7</td>
<td>$105.6</td>
</tr>
<tr>
<td>2017 Congestion Mitigation***</td>
<td>-</td>
<td>$15.6</td>
<td>$15.6</td>
</tr>
<tr>
<td>Total Ongoing Revenue Authorized</td>
<td>$105.6</td>
<td>$20.3</td>
<td>$125.9</td>
</tr>
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Remaining Annual Shortfall

* $4.7 million per year, to assist with state-match requirement for debt service
** Fuel and registration
***1% of sales tax after local revenue sharing

Progress Replacing State-System Bridges More Than 50 Years Old
(compare FY16 forecast to FY17 forecast)

We want to hear from you. Do you like this report? Would you like to send us comments? If so, go to: [https://apps.ttd.idaho.gov/apps/WebCommentsV2](https://apps.ttd.idaho.gov/apps/WebCommentsV2) For more information, visit our website at [www.ttd.idaho.gov](http://www.ttd.idaho.gov)
Funding Implications

Partnerships/Mobility as a Service
• “Big Data”
• The Value of Real Estate
• ???

Whim covers all your journeys
QUESTIONS?
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Infrastructure Focus Area Discussion
Idaho Autonomous Vehicle And Connected Vehicle Testing and Deployment Committee

Wrap-Up

Brian Ness
Director, Idaho Transportation Department
Idaho Autonomous Vehicle And Connected Vehicle Testing and Deployment Committee

Adjourned