ADVANCED AUTOMOTIVE TECHNOLOGY: INNOVATION AND PUBLIC POLICY IN STATE CAPITOLS

Council on State Governments
Automated Vehicle Forum – Detroit, Michigan
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From then...
...to now
Lives  Time  Fuel
94%
FROM CRASH SURVIVAL…
TO CRASH AVOIDANCE
Background: Automated Vehicles

“Braking and Acceleration”
Sensor-based technologies such as Adaptive Cruise Control and Automatic Emergency Braking can adjust vehicle speed and apply brakes to avoid potential collisions.

“Keeping in Lane”
Lane Change Assist, Lane Keeping Assist, and Blind Spot Monitoring can all help keep the vehicle in lane and navigate through traffic.

“Connected Automation”
Increased connectivity and advanced communications technologies allow cars to communicate with each other and surrounding infrastructure, and provide the driver with information to help avoid crashes, improve traffic flow, and increase efficiency.
Background: Automated Vehicles

The Paths to Full Automation:
Increasingly advanced automated features provide the foundation for a wide range of semi-autonomous and fully-autonomous vehicles.

Driver Assistance Systems
Automated features such as Automatic Emergency Braking and Lane Keeping Assist can help the driver in certain critical situations by either automatically applying the brakes to avoid or lessen the severity of an imminent collision, or providing corrective steering measures to keep the vehicle in its travel lane. Even with these systems, the driver remains in control at all times.

Advanced Automation
With advanced automation, the driver may relinquish control of the vehicle in certain driving conditions, but must monitor the performance of the automated systems. These features provide greater assistance to the driver by simultaneously performing the steering, braking, and acceleration. The role of the driver can vary depending on the level of automation, but drivers should be available to resume control.

Highly Automated
The concept of a “driverless” or self-driving car will become closer to reality with advances in artificial intelligence and advanced automation systems. Such vehicles will have the ability to navigate the roadway environment without the need for control or monitoring by a human driver.
Connected Automation

- Increased benefits of automation if vehicles can communicate with each other and the surrounding infrastructure.

- Vehicle to vehicle (V2V) communications is the “code that connects the network” across levels of automation.

- V2V provides additional awareness of roadway beyond existing sensing capabilities – camera, radar, and LIDAR.
Vehicle to Vehicle Communications

• V2V for cars to communicate directly exchanging anonymous and secure messages at the rate of ten times per second.

• What kind of information?
  • Speed, heading and direction of the vehicle, braking status.

• FCC set aside 5.9GHz spectrum that was dedicated to vehicle safety - - the Safety Spectrum.
Vehicle to Vehicle Communications

- NHTSA estimates that V2V communication can address up to **80 percent of crashes** involving unimpaired drivers.

- Global Automakers supports **NHTSA rulemaking** to require all new vehicles be equipped with dedicated short range communications devices to support V2V.

- **Vehicle-to-Infrastructure communications** can provide additional benefits. **Opportunity for states to embrace connectivity.**
Pilot Programs: Moving toward Smart Cities

• **Ann Arbor, Michigan**: where 3000 cars, trucks, and buses, showed the crash warning capability of connected vehicles.

• **New York City**: the focus will be on improving safety through the reduction of vehicle crashes.

• **Tampa, Florida**: the emphasis will be on reducing rush hour congestion.

• **Wyoming**: seeks to improve truck safety and reduce delays.

• **Columbus, Ohio**: Won a smart cities challenge-grant.
Importance of Public Policy

• Consistent National Framework
• Flexible, Nimble Approach
• Education and Engagement
• Research
• Focus on Testing
• Identify Barriers to Innovation
Section 2. (a) An autonomous vehicle may be operated in autonomous mode in this state only if NHTSA has issued a certificate of compliance for the make and model of the autonomous vehicle for the purpose of enforcing the traffic laws and other laws applicable to drivers and motor vehicles operated in this state, the person operating the autonomous vehicle in autonomous mode shall be deemed the driver of the autonomous vehicle, and where, if the person is physically present while it is in autonomous mode, the question of whether the person is physically present shall be determined by whether the person is engaged in an activity that is substantially concurrent with the driving of the vehicle.

1. “Autonomous technology” means technology that has the capability to drive a vehicle without the active physical control or monitoring by a human operator.
2. (A) “Autonomous vehicle” means any vehicle equipped with one or more collision avoidance systems, including, but not limited to, automatic emergency braking systems, pedestrian collision avoidance systems, automatic lane keeping systems, adaptive cruise control, lane departure warning, collision avoidance systems, and electronic blind spot assistance, automated emergency braking systems, traffic jam and queue assist, or other similar systems that enhance safety of driving the vehicle without the active control or monitoring of a human operator.

319.145 Autonomous vehicles.
(1) An autonomous vehicle registered in this state must continue to meet federal standards and regulations for a motor vehicle. The vehicle shall:
(a) Have a means to engage and disengage the autonomous technology which is easily accessible to the operator.
(b) Have a means, inside the vehicle, to visually indicate when the vehicle is operating in autonomous mode.
(c) Have a means to alert the operator of the vehicle if a technology failure affecting the ability of the vehicle to safely operate autonomously is detected while the vehicle is operating autonomously in order to indicate to the operator to take control of the vehicle.
B. The Federal and State Roles

The division of regulatory responsibility for motor vehicle operation between Federal and State authorities is clear. NHTSA responsibilities include:

- Setting FMVSS for new motor vehicles and motor vehicle equipment (to which manufacturers must certify compliance before they sell their vehicles);\(^\text{a}\)
- Enforcing compliance with the FMVSS;
- Investigating and managing the recall and remedy of non-compliances and safety-related motor vehicle defects and recalls on a nationwide basis;
- Communicating with and educating the public about motor vehicle safety issues; and
- Issuing guidance for vehicle and equipment manufacturers to follow, such as the Vehicle Performance Guidance for HAVs presented in this Policy.

States' responsibilities include other aspects of motor vehicle regulations:

- Licensing (human) drivers and registering motor vehicles in their jurisdictions;
- Enacting and enforcing traffic laws and regulations;
- Conducting safety inspections, where States choose to do so; and
- Regulating motor vehicle insurance and liability.
Arizona Governor Ducey signed an executive order directing agencies to undertake any necessary steps to support the testing and operation of automated vehicles.

Ohio Governor Kasich designated a stretch of US-33 as an innovation corridor and committed state resources to accelerate testing.

Washington Governor Inslee signed an executive order establishing pilot programs for testing of vehicles both with and without human operators.

Wisconsin Governor Walker signed an executive order creating the Governor’s Steering Committee on Autonomous and Connected Vehicle Testing and Deployment.

Virginia Governor McAuliffe created a partnership allowing research and development for autonomous vehicles to take place in the state with “Virginia Automated Corridors.”
MICHIGAN, OHIO, and PENNSYLVANIA

- Smart Belt Coalition to Collaborate on Autonomous Vehicle Development

- Coalition of state agencies and academic institutions will support research and testing for automated and connected vehicle initiatives.

- Creating a testing site that can cross state boundaries and running the same tests in three different locations can advance the research.
ELIMINATE BARRIERS TO INNOVATION
AVOID STATE PATCHWORK
EMBRACE CONSISTENT NATIONAL MODEL
ROLE OF FEDERAL AND STATE GOVT.
PROMOTE AV TESTING
GET INVOLVED – SMART CITIES / V2X
ENGAGE WITH STAKEHOLDERS
BACKUP SLIDES
Acting Ahead of Regulation

• Protecting the safety of critical driving systems.

• Auto industry has developed a voluntary system to share information about threats and vulnerabilities across the industry.

• Committed to protecting sensitive information about owners and drivers through voluntary “privacy principles,” such as requesting permission prior to use of personal information.
Policy to Support Innovation

MAYBE WE’LL GET A CHANCE TO SHOW WHAT WE CAN DO!

TO PARAPHRASE THE BEATLES, MAYBE “...WE’LL GET A LICENSE TO DRIVE...”

MICHIGAN LAWMAKERS CONSIDER AUTONOMOUS VEHICLE BILLS

— RESPECTS TO DISNEY AND PIXAR

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