Autonomous Vehicles

Region III Information Exchange

October 29, 2014

Cathie Curtis, Director Vehicle Programs
• What are Autonomous Vehicles?
• Why is this technology important?
• How will AV impact DMVs?
• How is AAMVA helping DMVs to prepare?
• How can you stay informed?
What are Autonomous Vehicles?

NHTSA defines levels of Autonomous Vehicles

• Level 0 - No Automation
  Driver is in complete control, may have some support/convenience systems. In vehicles today.

• Level 1 – Function Specific Automation
  May have multiple systems to provide driver support and crash avoidance but does not replace driver. In vehicles today.
What are Autonomous Vehicles?

Level 2 Combined Function Automation

At least two primary control functions designed to work in unison to relieve driver of control in certain limited driving situations. Driver must monitor roadway. In some vehicles today. Will see in more models in the next few years.
What are Autonomous Vehicles?

Level 3 Limited Self-Driving Automation

Driver may turn over full control of the all safety-critical functions of the vehicle under certain conditions. Driver does not have to constantly monitor roadway but must be ready and able to take control. Exists today but in early stages of testing/development.
What are Autonomous Vehicles?

Level 4 Full Self-Driving Automation

Driver inputs destination and navigation but is not expected to be available for control at any time. Early stages of development and testing.

https://www.youtube.com/watch?v=CqSDWoAhvLU
Why is this technology important?

• Most car manufacturers and many technology companies are engaged in some type of AV development.

• 5.3 million vehicle crashes a year in the US.

• More than 30,000 people are killed in the US in crashes each year.

• 2.2 million people injured in crashes each year.

• Most crashes are due to human error. AV have the potential to reduce number of crashes.
Why is this technology important?

- Potential to increase mobility of people that can not drive due to a disability or a medical condition.

- There are also some theories that AV will reduce traffic congestion, reduce fuel consumption and reduce emissions.
Impact On Motor Vehicle Administration and Law Enforcement

• AV’s will have impacts on governmental policies, laws and regulations, roadway infrastructure, legal aspects and law enforcement, insurance coverage, driver's licenses and more

• Road safety and DMV Administrators, Policy makers, Law enforcement, insurance companies and others need to prepare for and accompany the emergence of this technology

• Important to create a group to share information as a starting point
• Regulations are being developed now for the testing of AV on public ways in several jurisdictions.

• As vehicles with level 2 and 3 automation become available to the public, laws, polices and procedures need to developed in all jurisdictions to keep pace with the operation of the vehicles by the general public.
• Formed Information Sharing Group Fall 2013

• Great response from AAMVA community; 40 participant, 21 jurisdictions represented. Industry and US federal government participating as well.

• Different areas of expertise: Road safety and DMV Administrators, policy makers, program managers, law enforcement, industry
Purpose of the group

- Information gathering and sharing
  - Discuss the different aspects and problems related to AV’s
    - Jurisdictions that have been working on AV’s can share their expertise
    - Presentations on different aspects of AV technology and their impacts
Created 3 subgroups:

1. Create a library of information on AAMVA’s website.

2. A legal analysis group to capture and analyze current laws in states.

3. Develop the framework for issues that relate to AV regulation.
AAMVA Headquarters Settles in to New Location

On Monday, September 29th, AAMVA headquarters moved to its new location in Arlington, VA. Phone numbers and email addresses have NOT changed. Our new mailing address will be 4481 Wilson Boulevard, Suite 700, Arlington, VA 22203.

AAMVA Names Anne Ferro New President and CEO

The Board of the American Association of Motor Vehicle Administrators welcomes Anne Ferro as their new President and CEO. Prior to taking on her role at AAMVA’s helm, Ferro served as the U.S. Department of Transportation’s Federal Motor Carrier Safety Administrator. Read the full press release. Watch Anne Ferro’s welcome message to AAMVA members.
AAMVA advocates uniform standards in registration and titling and motor carrier programs. Resources here offer information on relevant systems, programs and policies. Registration and titling activities contribute to the safety mission of AAMVA by:

- Helping law enforcement identify a vehicle involved in a crime, crash or traffic violation
- Verifying insurance of the vehicle
- Verifying proof of ownership and other identifying information about the vehicle
- Verifying the state operating condition of vehicles (i.e., brand for salvage, flood or other damage)
- Providing the Vehicle Identification Numbers needed in order to conduct safety recalls

The following resources offer information on relevant systems, programs and policies:

- Autonomous Vehicle Information Library
- DMV Tolling Partnership Whitepaper
- Safety and Emissions Inspections
- Motor Carriers
- Vehicle and Equipment Standards
- Fast Track to Vehicle Services Facts (2003)
Autonomous Vehicle Information Library

AAMVA has established an Autonomous Vehicle Information Sharing Group to gather, organize and share information with the AAMVA community related to the development, design, testing, use and regulation of autonomous vehicles and other emerging vehicle technology.

New technology has been developed and continues to evolve that allows vehicles to be operated with less human interaction than is required today. The AAMVA community needs to be aware of the capabilities of the technology as it emerges, use this information to develop short and long range plans within their vehicle and driver programs, as well as gain an understanding of the effects on governmental policies and regulations, roadway infrastructure, legal aspects and law enforcement, environmental factors, insurance coverage, driver's licenses and more. It will become increasingly necessary to develop plans to regulate the vehicles, the manufacturers and operators as the technology becomes available.

Chair: Johanne St-Cyr, Vice-présidente à la sécurité routière, Société de l'assurance automobile du Québec
Vice Chair: Bernard Soriano, Deputy Director, California Department of Motor Vehicles
AAMVA Staff Liaison: Cathie Curtis, Director, Vehicle Programs

General Information

- KPMG
  Self Driving Cars: The Next Revolution

- KPMG
  Self Driving Cars: Are We Ready?

- United States Government Accountability Office
  Vehicle-to-Vehicle technologies
# Autonomous Vehicle Information Sharing Group
## Analysis of Laws Enacted in Jurisdictions

<table>
<thead>
<tr>
<th>State</th>
<th>District of Columbia</th>
<th>Florida</th>
<th>Georgia</th>
<th>Nevada</th>
<th>Michigan</th>
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<tbody>
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<td></td>
<td>Authorizes autonomous vehicles to operate on District roadways, requires the Department of Motor Vehicles to create an autonomous vehicle designation, and establishes safe operating protocols for autonomous vehicles.</td>
<td>Encourages the safe development, testing, and operation of motor vehicles with autonomous technology on the public roads of the state.</td>
<td>Authorizes testing and operation of autonomous vehicles on public roads, subject to specific requirements.</td>
<td>Authorizes the public to register an autonomous vehicle on the roads and highways.</td>
<td>Permits testing of certain vehicles operating in defined areas, permits testing at the discretion of the department, defines operator requirements, original manufacturer responsibility, a third-party has no responsibility for the vehicle, directs state to submit report by January 1, 2017.</td>
</tr>
</tbody>
</table>
Autonomous Vehicles Information Sharing Group
Analysis of Regulations Enacted in Jurisdictions
Executive Summary, Prepared by the Legal Analysis Subgroup

Florida has developed internal procedures that require Autonomous Vehicles used for testing, to be titled and branded as AUTONOMOUS VEHICLE on the paper title and in the department's computer system. If the autonomous equipment is removed from the vehicle, the vehicle will be branded PRIOR AUTONOMOUS. Most autonomous vehicles title transactions must be processed at the Florida DMV office and cannot be processed by tax collectors or license plate agents.

Georgia, Nevada and Michigan’s general title requirements apply. The District of Columbia will address title requirements at a later date with implementing rules.

6. Registration Requirements
California and Florida may develop rules that will require a special registration for autonomous vehicles used as test vehicles. Florida created internal procedures that require the words “AUTONOMOUS VEHICLE” to be printed on the registration. Nevada will issue a registration for autonomous vehicles used for testing purposes. Michigan will issue a registration to the manufacturer of an autonomous vehicle used for testing.

7. License Plate Requirements
Nevada will issue a special designated plate for autonomous vehicles used for testing indicating the vehicle is an autonomous vehicle. Michigan will issue a special plate approved by the Secretary of State to autonomous vehicles used for testing. The other states did not specify or identify a specific plate in statute for autonomous vehicles.
Next Steps

• Formal working group to begin fall 2014 through 2016.

• Working Group to develop model legislation, regulations and best practices:
  1. Manufacture testing/reporting
  2. Operations of vehicles by general public
Regulation of Manufacturers by Jurisdictions

Regulations may address:

- Testing on public roadways
- Special Permits
- Operators of the test vehicles
- Maintaining records of testing
- Insurance/bonds
- Vehicles registered and titled
- And more
Next Steps

Regulation of the use of AV by General Public

- Training, testing, licensing of operators
- Registration/Title
- Insurance/liability
- Driving while impaired
- Driving while distracted
- Privacy concerns
- Violations/Enforcement
- And more
Connected vehicles allow for interoperable networked wireless communications among vehicles, the infrastructure, and passengers’ personal communications devices.

In research and development at this time.
Connected Vehicles

Connected vehicle applications provide connectivity:

• Among vehicles – has the potential to alert drivers of events and may enable crash prevention **V2V**

• Between vehicles and the infrastructure to enable safety, mobility and environmental benefits. **V2I**

• Among vehicles, infrastructure, and wireless devices to provide continuous real-time connectivity to all system users
V2V By exchanging anonymous, vehicle-based data regarding position, speed, and location (at a minimum), V2V communications enables a vehicle to sense threats and hazards with a 360 degree awareness of the position of other vehicles and the threat or hazard they present; calculate risk; issue driver advisories or warnings; or take pre-emptive actions to avoid and mitigate crashes.
V2I  Vehicle-to-infrastructure communications is the wireless exchange of critical safety and operational data between vehicles and highway infrastructure, intended primarily to avoid or mitigate motor vehicle crashes.

The vision of V2I Communications is that a minimum level of infrastructure will be deployed to provide the maximum level of safety and mobility benefits for highway safety and operational efficiency nationwide.
Real Time Data Capture

• Real-Time Data Capture and Management is the creation and expansion of access to high-quality, real-time and archived, transportation data that is captured from connected vehicles
• Can be used to transform transportation management
Potential success of connected vehicles:

• Reduction in highway fatalities
• Reduction in traffic incident-related travel delays
• Reduction in vehicle emissions
• Increased efficiencies in traffic management
• Reduce environmental impacts of travel
Key challenges in developing connected vehicle technologies

- Resolving technical challenges
- Testing and determining actual benefits of applications
- Determining whether overall benefits are sufficient to warrant implementation
- If so, how the systems would be implemented
- Addressing public acceptance issues such as maintaining user privacy and whether the systems in vehicles are effective, safe, and easy to use

U.S. DOT and its public and private partners are currently developing strategic plans to address these challenges.
• Lot’s of interesting questions and challenges to come

• The AAMVA community must coordinate our collective energies towards preparing for the emergence of AV’s and connected vehicles

• AAMVA AV Working Group to help identify and define the issues and then develop best practices and model legislation regarding autonomous vehicles for jurisdictions.
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