American Association of Motor Vehicle Administrators

Automated Vehicles - Technical Assistance for North Carolina

Agenda Item #11

February 27 – 28, 2020

OUR VISION

Safe drivers
Safe vehicles
Secure identities
Saving lives!

Lt. Colonel Rick Arnold, Michigan State Police
Assistant Chief Chris Childs, California Highway Patrol
Captain John Ehmsen, Colorado State Patrol
Mr. Kevin Jacobs, Florida Dept. of Highway Safety and Motor Vehicles
Staff Sergeant Terry McDonnell, New York State Police
Brian Ursino, Director of Law Enforcement, AAMVA

Chapter 6. Law Enforcement Considerations (from Edition 2)

6.1 Vehicle Identification
6.2 Crash/Incident Reporting
6.3 Criminal Activity
6.4 Distracted Driving
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6.11 System Misuse and Abuse
6.12 Cybersecurity for Vehicles with Automated Driving Systems

Subsections in RED are new in Edition 2

Chapter 6. Law Enforcement Considerations (from Edition 2)

6.1 Vehicle Identification

Identification of a motor vehicle as an ADS-equipped vehicle is necessary for law enforcement officers and other first responders (police, fire, EMS and tow and recovery services) to fulfill their duties.

From a law enforcement perspective, traditional means for identifying a vehicle via a license plate check may not be the optimal method to identify the vehicle as an ADS.

Vehicle labeling or permanent marking to identify the vehicle equipped with ADS allows for redundant marking in multiple locations (exterior and interior), improving conspicuity from multiple vantage points.

Chapter 6. Law Enforcement Considerations (from Edition 2)

6.2 Crash/Incident Reporting

Crash and incident reporting are important for purposes of identifying and documenting safety concerns and establishing liability.

Crash report information is not only of importance to manufacturers and the engineering community, but to a variety of public constituencies, including regulators and legislators.

Full disclosure of information concerning how a crash occurred will be essential to future development, regulation and public acceptance of ADS.

Chapter 6. Law Enforcement Considerations (from Edition 2)

6.3 Criminal Activity

ADS-equipped vehicles have the potential to improve driving safety and make mobility more efficient. However, they will also create greater possibilities for dual use applications and ways for a vehicle to be used to further criminal enterprises, or worse, be used as a tool for the delivery of explosives or other means of causing harm.

Although ADS-equipped vehicles may substantially reduce the risk of in-vehicle distractions leading to crashes, criminals will also be able to conduct tasks that require use of both hands or to take one's eyes off the road. Aiming and firing a weapon at a pursuing patrol vehicle is an example of a multi-tasking threat.

Chapter 6. Law Enforcement Considerations (from Edition 2)

6.4 Distracted Driving

The term distraction as used by NHTSA is a specific type of inattention that occurs when drivers divert their attention away from the driving task to focus on another activity. These distracting tasks can affect drivers in different ways, and can be categorized into the following types:

- Visual distraction: Tasks that require the driver to look away from the roadway to visually obtain information.
- Manual distraction: Tasks that require the driver to take hand(s) off the steering wheel to manipulate a device or other distracting activity.
- Cognitive distraction: Tasks that are defined as the mental workload associated with a task that involves thinking about something other than the driving task.

A quick discussion about the dangers of people treating ADS as Autonomous!

Chapter 6. Law Enforcement Considerations (from Edition 2)

6.5 Establishing Operational Responsibility & Law Enforcement Implications

Jurisdictions have legal authority to regulate vehicle operation by humans but may not have established authority over non-human operation. This uncertainty presents significant challenges to enforcement of traffic laws and to establishing legal responsibility when Level 3-5 vehicles are involved in motor vehicle crashes on public roads. Jurisdictions will need to address the following issues:

- Is the driver of a vehicle with automated features engaged still responsible for the operation of that vehicle even if they are not performing the DDT?
- In such instances, how will law enforcement officers know when the human is actively driving or if the ADS is in control?

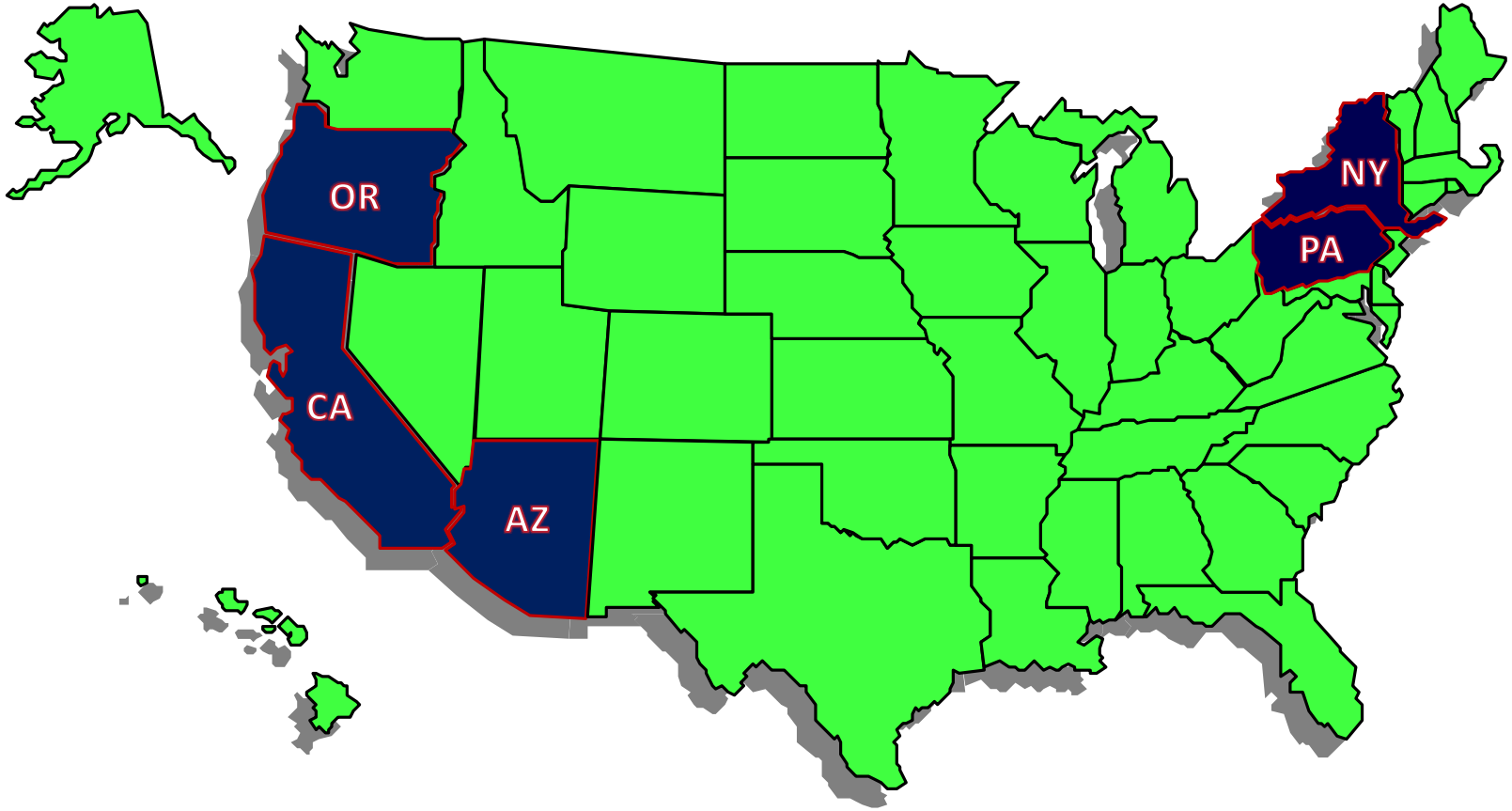
Chapter 6. Law Enforcement Considerations (from Edition 2)

6.6 Law Enforcement/First Responder Interaction Plans (LEIP)

6.7 Law Enforcement Protocols (LEP) for Level 4 and 5 Vehicles

What's the Difference?

Law Enforcement/First Responder Interaction (Safety) Plans



Law Enforcement/First Responder Interaction (Safety) Plans

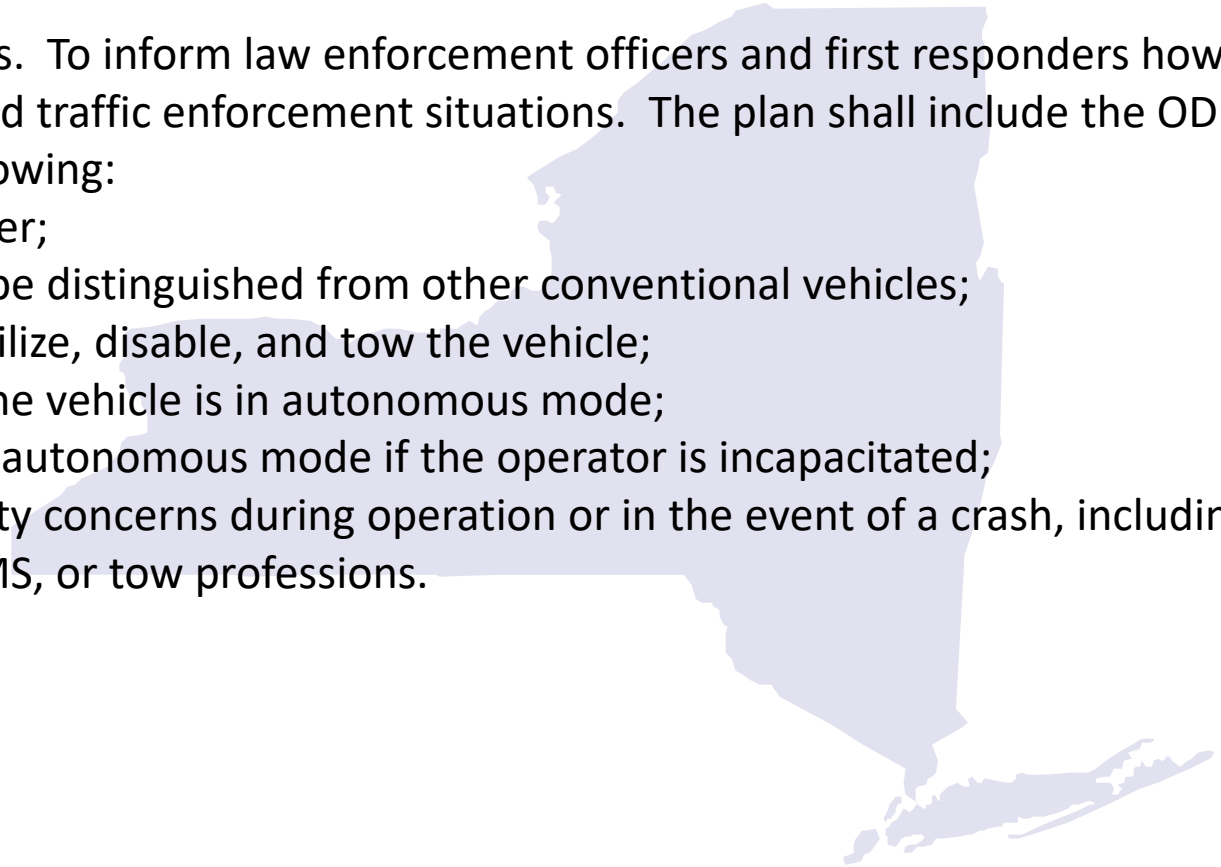
Law Enforcement Interaction Plan: California CCR 227.38(e)

Applies to vehicles without drivers. Made available to Law Enforcement and other first responders in the vicinity of the ODDs to Instruct those agencies how to interact with the vehicle in emergency and traffic enforcement situations.

Shall include but not be limited to:

(A) How to communicate with a remote operator, who is available at all times;
(B) Where in the vehicle to obtain owner information, vehicle registration, proof of insurance;
(C) How to safely remove the vehicle from the roadway;
(D) How to recognize whether the vehicle is in autonomous mode, & how to disengage;
(E) How to detect and ensure the autonomous mode has been deactivated;
(F) How to safety interact with electric and hybrid vehicles, when applicable;
(G) A description of the ODD
(H) Any additional information regarding safety risks.

Law Enforcement Interaction Plan: New York (specified in AV2 application)



Applies to all test vehicles. To inform law enforcement officers and first responders how to safely interact with test vehicles in emergency and traffic enforcement situations. The plan shall include the ODDs and shall also include, but not be limited to the following:

1. Contact phone number;
2. How the vehicle will be distinguished from other conventional vehicles;
3. How to safely immobilize, disable, and tow the vehicle;
4. How to recognize if the vehicle is in autonomous mode;
5. How to disengage an autonomous mode if the operator is incapacitated;
6. Any other public safety concerns during operation or in the event of a crash, including any that may impact law enforcement, fire, EMS, or tow professions.

Arizona – Law Enforcement Protocol for Fully Autonomous Vehicles

- Issued June 4, 2018 by AZ Dept. of Public Safety to all allied law enforcement agencies in AZ.
- To provide procedural guidance when investigating collisions, traffic or criminal violations, or any incident involving a ***fully autonomous vehicle*** with no operator present.

Directive to Enforcement Personnel – Traffic Collisions

1. Investigate crashes consistent with AZ statutes
2. The vehicle owner shall be recorded on the Crash Report
3. In the case of property damage or injury to a person, the officer shall report the autonomous vehicle owner's name, address, and insurance information to all involved parties. (This information is accessed through the AZ DMV.)
4. If the fully autonomous vehicle violates a traffic law resulting in the collision, the officer may issue a citation to the *registered owner of the vehicle*.

Directive to Enforcement Personnel – Disabled Vehicles

1. If the fully autonomous vehicle is disabled as a result of collision or malfunction and the owner is unable to provide for custody or removal, the officer shall remove it or cause it to be removed consistent with existing laws, ie. obstruction, disabled in gore area, causes a hazard. (instructions on file with DPS and DMV)
2. Officer shall fully inventory any vehicle prior to removal.

Directive to Enforcement Personnel – Other Violations (title 28)

1. Unregistered/not displaying plates;
2. AV documents not on file with DMV indicating financial responsibility;
3. Equipment violations;

All citations and/or repair orders shall be issued to the registered owner on file

Chapter 6. Law Enforcement Considerations (from Edition 2)

6.8 Law Enforcement/First Responder Safety & Training

It is essential that law enforcement and other first responders receive specific training regarding the potential hazards they may face and how ADS-equipped vehicles may impact their duties.

These hazards include, but may not be limited to:

- silent operation,
- self-initiated or remote ignition,
- high voltage, and
- unexpected movement.

Chapter 6. Law Enforcement Considerations (from Edition 2)

6.9 Adherence to Traffic Laws

Although all jurisdictions have laws regarding speed limits, minimum and maximum speed limits may vary significantly between jurisdictions. it is common knowledge that compliance with those limits is often low, and drivers often adjust their vehicle speed to that of the prevailing flow of traffic.

Users frequently set the vehicle cruise control to speeds that exceed the speed limit. In light of this common practice, there is concern that future consumers of ADS-equipped vehicles may desire similar discretionary control of the maximum operating speed leading manufacturers to develop ADS-equipped vehicles capable of violating speed limits and other traffic laws.

However, manufacturers should give consideration to exigent circumstances when it may be necessary to perform maneuvers which may otherwise violate traffic laws, such as following the directions of police officers or flaggers to cross double yellow lines or drive on a sidewalk to avoid hazards such as at a crash scene, a flooded road, or road debris.

Chapter 6. Law Enforcement Considerations (from Edition 2)

6.10 Vehicle Response to Emergency Vehicles, Manual Traffic Controls and Atypical Road Conditions

Object and event detection and response (OEDR) refers to the detection by the driver or ADS of any circumstance that is relevant to the immediate driving task, as well as the appropriate driver or system response to such circumstances as:

- both moving and stopped emergency vehicles;
- emergency workers and other pedestrians manually directing traffic;
- changing traffic patterns or conditions in roadway construction and maintenance zones;
- crash scenes; and
- road debris or other obstructions.

Chapter 6. Law Enforcement Considerations (from Edition 2)

6.11 System Misuse and Abuse

Misuse of an automated vehicle system may be defined as operating automated features improperly or inappropriately.

Abuse of an automated vehicle system may be defined as the intentional or malicious use of ADS capabilities for some unlawful purpose.

Crash and criminal investigation would be greatly aided by electronic records of the human/machine interface (HMI). FMVSS codified in 49 CFR/Part 563 currently specifies that certain information be recorded by vehicle event data recorders (EDRs), but the data stored may be inadequate for the forensic need in determining misuse or abuse.

Chapter 6. Law Enforcement Considerations (from Edition 2)

6.12 Cybersecurity for Vehicles with Automated Driving Systems

NHTSA recommends industry undertake a layered approach to harden ADS-equipped vehicle's electronic architecture against possible attacks, both wireless and wired, to reduce the chances of a successful attack and mitigate any effects of unauthorized access.

The National Institute of Standards and Technology (NIST) has created a cybersecurity framework which provides a systematic and comprehensive layered cybersecurity approach.

Additional Resources Available:

- National Highway Traffic Safety Administration. (2016, October). *Cybersecurity Best Practices for Modern Vehicles*. (Report No. DOT HS 812 333). Washington, DC.
- Center for Internet Security. *Critical Security Controls for Effective Cyber Defense*. https://www.cisecurity.org/controls/
- National Institute of Standards and Technology. *Framework for Improving Critical Infrastructure Cybersecurity*. PowerPoint presentation online at: https://www.nist.gov/system/files/documents/cyberframework/Cybersecurity-Framework-for-FCSM-Jan-2016.pdf
- SAE International standard J3061 *Cybersecurity Guidebook for Cyber-Physical Vehicle Systems*. https://www.sae.org/standards/content/j3061_201601/