



American Association of
Motor Vehicle Administrators

emerging ADS
technologies
ADAS PERSONAL
ELECTRONIC
education DEVICES



Strengthening Distracted Driving Education, Legislation, and Enforcement

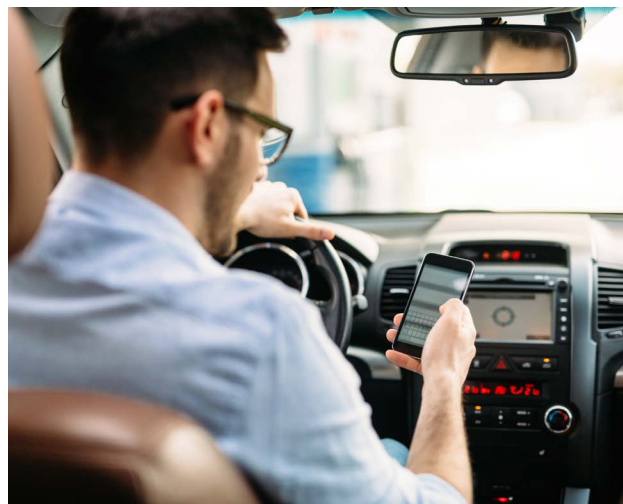
*A Whitepaper Augmenting Safe Testing and
Deployment of Vehicles Equipped with Automated
Driving Systems Guidelines, Edition 2*



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Background

The National Highway Traffic Safety Administration (NHTSA) defines distracted driving as “any activity that diverts attention from driving.” With the proliferation of personal electronic devices and in-vehicle technology in our society, many jurisdictions have enacted or pursued enhancements to distracted driving laws to reduce or eliminate crashes in which the proximate cause is distracted driving alone or in combination with other violations. Every day, approximately nine people are killed and more than 1,000 injured in crashes involving distracted driving. As reported by NHTSA, distracted driving is a factor in approximately 14% of all fatal crashes in the United States.* The Governor’s Highway Safety Association (GHSA) recommends states ban handheld cell phone use by all drivers and include a texting ban as part of that law. GHSA’s policy and a table of state distracted driving laws can be found [here](#).†



The impact of distractions on driving is determined not just by the type of distraction but also by the frequency and duration of the distraction. Because drivers often have a choice regarding when and how often to multitask when driving, their exposure to risk is typically within their control; however, some research has shown drivers underestimate the overall risk of various distractions.‡

Distracted driving law violations can lead to serious implications for Commercial Driver License (CDL) holders who are subject to federal and state rules of the road statutes. Violation of certain state distracted driving laws is also a violation of 49 CFR 392.2: “Every commercial motor vehicle must be operated in accordance with the laws, ordinances, and regulations of the jurisdiction in which it is being operated.” If a CDL holder is cited for a violation such as distracted driving, the State Driver Licensing Authority is notified, and it is recorded as a violation of 49 CFR 383 and may result in suspension of the driver’s CDL.

The International Association of Chiefs of Police (IACP), in partnership with the NHTSA, published

‡ Overview of the National Highway Traffic Safety Administration’s Driver Distraction Program, DOT HS 811 299, April 2010

The purpose of this white paper is to provide guidance to jurisdictions on strengthening distracted driving education, legislation, and enforcement to better address existing and emerging technologies including ADAS- and ADS-equipped vehicles.

Although cellphone use is not the only reason for driver distraction, it poses a significant risk to roadway safety. Texting is especially concerning because it combines visual, manual, and cognitive functions. Sending or receiving a text takes a driver’s eyes from the road for an average of 4.6 seconds; at 55 mph, this is the equivalent of driving the length of an entire football field.

* Distracted Driving in Fatal Crashes, 2017, National Highway Traffic Safety Administration, April 2019

† Governor’s Highway Safety Association, Distracted Driving Laws Chart, July 2020

the *Distracted Driving Toolkit* in October 2019. This toolkit was created to provide law enforcement agencies tools to improve distracted driving education and enforcement. At the heart of any effective distracted driving enforcement strategy is strong distracted driving legislation. Although some jurisdictions have yet to enact distracted driving legislation, other jurisdictions have distracted driving laws that are difficult to enforce and could be strengthened based on the recommendations set forth by the American Association of Motor Vehicle Administrators (AAMVA), GHSA, IACP, and NHTSA.

Although a number of manufacturers make ADAS technology available, the following two examples, both involving Tesla vehicles, are used because of the substantial media coverage these events received and because they both involved state highway patrol vehicles.

One real-life example of distraction in a vehicle equipped with ADAS is an August 26, 2020, crash reported in multiple news outlets. A man was watching a movie while his Tesla, with its “auto-pilot” engaged, crashed into a Nash County, North Carolina, deputy’s car and pushed it into a North Carolina Highway Patrol car. The driver admitted to watching a movie and was cited for violation of North Carolina’s move-over law and its law regarding the location of a television in a vehicle.



Another example occurred on July 14, 2020, when a Tesla operating with “auto-pilot” engaged rear ended an Arizona state trooper’s vehicle and caused a chain reaction crash. The patrol vehicle was pulled over on the side of the highway while a sergeant was helping at the scene of an earlier collision. The Tesla struck the patrol

vehicle with such force it pushed it into an ambulance also parked at the scene. It is believed the Tesla’s operator may have been asleep when the crash occurred.



See the definitions section for definitions of the five levels of automation developed by the Society of Automotive Engineers (SAE) International. Distracted driving is of primary concern in vehicles with Level 0 to 3 of automation because distracted driving should become a non-issue in Level 4 and 5 vehicles. However, Level 4 and 5 vehicles being “tested” on public roads have operators who can become distracted when they may need to assume control of the vehicle. Both ADAS and ADS vehicles are addressed, as applicable, in the following guidelines.

Guidelines for Testing ADS-Equipped Vehicles

When testing any ADS-equipped vehicle, the user is an active participant in the testing process; therefore, all distracting activities should be prohibited, both by jurisdictional law and by company policy enacted by companies testing ADS-equipped vehicles on public highways.

Recommendations for Manufacturers and Other Entities (MOE)

MOE 1. Manufacturers and other entities should minimize distractions in ADS-equipped vehicles.*

* This appears in *Jurisdictional Guidelines for the Safe Testing and Deployment of Vehicles Equipped with Automated Driving Systems* as MOE 17.

MOE 2. Manufacturers and other entities should prohibit users from all added distracting activities when testing any ADS-equipped vehicle.*

MOE 3. Manufacturers and other entities should incorporate technology to alert the “driver” when the ADS cannot maintain or complete the driving task and the “driver” needs to assume control of vehicle operation.

Guidelines for Deployed Vehicles

Deployed ADS-equipped vehicles (Level 4 or 5) will make “distracted driving” a non-issue because there will be no human “driver” responsible for conducting the dynamic driving task (DDT). However, in Level 1 to 3 vehicles, there must be a “driver” present who can conduct the DDT when the vehicle technology is not engaged or when it is incapable of doing so.

It is important to understand that a Level 2 vehicle is defined by SAE International as

Partial Driving Automation, the sustained and ODD-specific (where “ODD” is the operational design domain) execution by a driving automation system of both the lateral and longitudinal vehicle motion control subtasks of the DDT with the expectation that the driver completes the object and event detection and response (OEDR) subtask and supervises the driving automation system.

The key in this definition is the driver supervises the driving automation system.

Compare this with the definition of a **Level 3** vehicle, which is defined by SAE International as

Sustained and ODD-specific performance by an ADS of the entire DDT with the expectation that the DDT fallback-ready user is receptive to ADS issued requests to intervene, as well as to DDT performance relevant system failures in other vehicle systems and will respond appropriately.

* This appears in *Jurisdictional Guidelines for the Safe Testing and Deployment of Vehicles Equipped with Automated Driving Systems* as MOE 18.

The key in this definition is the ADS issues a request for the driver to intervene.

Put simply, a Level 2 vehicle cannot recognize a situation it cannot handle. The driver must be cognitively engaged and recognize if a dangerous situation is evolving and decide to take over the DDT at the appropriate time. Conversely, a Level 3 vehicle, in which the system recognizes when a situation is evolving that it cannot handle, notifies the driver to take over. The system makes the decision, and the driver must be prepared to react to that decision notification.

Manufacturers should design Level 1, 2, and 3 vehicles equipped with systems capable of conducting the DDT under certain conditions with a means of identifying when a vehicle does not require the driver to be in control of the DDT so an officer knows if use of a mobile electronic device or other distracting activity is legal at the time of observation.

Recommendations for Jurisdictions

1. Utilize the best available distracted driving educational materials in proactive public education efforts. One such source is the IACP [Distracted Driving Toolkit](#).
2. Pursue legislation enacting a comprehensive distracted driving law (see model legislation below this section).

Recommendations for Manufacturers and Other Entities

MOE 4. Manufacturers and other entities should design ADS-equipped vehicles with a means of identifying when a vehicle is in automated mode to facilitate effective enforcement of distracted driving laws (i.e., so an officer knows if using a hand-held device is legal at the time of observation).†

† This appears in *Jurisdictional Guidelines for the Safe Testing and Deployment of Vehicles Equipped with Automated Driving Systems* as MOE 19.

MOE 5. Manufacturers should incorporate technology that monitors the driver's awareness (monitoring eyes and/or hand placement) with the vehicle prompting disengagement of activated self-driving mode if the driver is not paying sufficient attention to the DDT.

In 2018, there was a fatal crash involving a Tesla with Level 2 technology engaged. The crash occurred in Mountain View, California, and the California Highway Patrol assisted the National Transportation Safety Board (NTSB) with its subsequent investigation. In 2020, the NTSB published *Collision Between a Sport Utility Vehicle Operating with Partial Driving Automation and a Crash Attenuator, Mountain View, California, March 23, 2018*.^{*} In this report, the NTSB made two recommendations to the NHTSA, consistent with MOE 5 above:

- For vehicles equipped with Level 2 automation, work with SAE International to develop performance standards for driver monitoring systems that will minimize driver disengagement, prevent automation complacency, and account for foreseeable misuse of the automation.

^{*} NTSB/HAR-20/01. Washington, DC

- After developing the performance standards for driver monitoring systems recommended in Safety Recommendation H-20-X, require all new passenger vehicles with Level 2 automation be equipped with a driver monitoring system that meets these standards.

Benefits of Implementation

It is anticipated there will be a reduction in crashes caused by driver distraction.

Challenges to Implementation

Many jurisdictions have laws prohibiting distracted driving, and some policymakers or legislative bodies may resist enhancing current laws by making them more encompassing or elevating them to a primary offense so offenders can be stopped by law enforcement without another violation being observed. However, many of these existing laws continue to allow some distracting activities (i.e., texting being the only distracting activity expressly prohibited).

Definitions

Automated Driver-Assistance System (ADAS)

System designed to help drivers with certain driving tasks such as staying in the lane, parking, avoiding crashes, and reducing blind spots. ADAS are generally designed to improve safety or reduce the workload on the driver. With respect to automation, some ADAS features could be considered SAE International Level 1 or Level 2, but many are Level 0 and may provide alerts to the driver with little or no automation.

Automated Driving System (ADS)

The hardware and software that are collectively capable of performing the entire DDT on a sustained basis, regardless of whether it is limited to a specific ODD; this term is used specifically to describe a Level 3, 4, or 5 driving automation system.

ADS-equipped vehicle

A vehicle equipped with an Automated Driving System (ADS).

Distracted driving

Occurs when a person engages in any activity not related to the DDT in a manner that interferes with the safe operation of such motor vehicle on any highway. 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 engage in some 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

Driver

A user who performs in real time part or all the DDT and DDT fallback for a particular vehicle. NOTE: In a vehicle equipped with a driving automation system, a driver may in some vehicles assume or resume performance of part or all the DDT from the ADS during a given trip.

Dynamic driving task (DDT)

All the real-time operational and tactical functions required to operate a vehicle in on-road traffic, excluding the strategic functions such as trip scheduling and selection of destinations and waypoints and including

1. lateral vehicle motion control via steering (operational);
2. longitudinal vehicle motion control via acceleration and deceleration (operational);
3. monitoring the driving environment via object and event detection, recognition, classification, and response preparation (operational and tactical);
4. object and event response execution (operational and tactical);
5. maneuver planning (tactical); and
6. enhancing conspicuity via lighting, signaling, and gesturing, and so on (tactical).

Operational design domain (ODD)

The specific conditions under which a given driving automation system or feature is designed to function, including, but not limited to, driving modes. An ODD may include geographic, roadway, environmental, traffic, speed, and temporal limitations. Previously, the term “driving mode” was used; “ODD” is now the preferred term for many of these uses.

Personal electronic device: Any portable electronic device that is capable of wireless communication or electronic data retrieval and is not manufactured primarily for hands-free use in a motor vehicle. “Personal electronic device” includes, but is not limited to, a cell phone, tablet, laptop, two-way messaging device, or electronic game. “Personal electronic device” does not include two-way radio, citizens band radio, or amateur radio equipment.

SAE International levels of automation: Society of Automotive Engineers (SAE) International, which devises consensus standards for the engineering industry, established a six-tier classification system ranging from no vehicle automation to full vehicle automation:

- Level 0 – No Driving Automation
- Level 1 – Driver Assistance
- Level 2 – Partial Driving Automation
- Level 3 – Conditional Driving Automation
- Level 4 – High Driving Automation
- Level 5 – Full Driving Automation

Model Legislation

Dangerously Distracted Driving

- (1) (a) It is a crime to drive dangerously distracted.
 - (b) This section applies to Level 1, 2, and 3 vehicles* unless the Level 3 vehicle is equipped with a visual system capable of being observed by a law enforcement officer within [X] feet of the vehicle that indicates the vehicle's ADS is engaged.
 - (c) Enforcement of this crime may be accomplished as a primary enforcement action when a driver of a motor vehicle has been observed in violation of this section or the section on use of personal electronic devices, to the degree that the driver's activity is having an apparent adverse impact on the safe operation of the vehicle being operated on any highway. Causing or nearly causing a collision (with a vehicle, fixed object, or person) while using a personal electronic device constitutes prima facie evidence that the driver was dangerously distracted by the personal electronic device.
- (2) Subsection (1) of this section does not apply to
 - (a) a driver who is using a personal electronic device to contact emergency services;
 - (b) the use of a system by a transit system employee for time-sensitive relay communication between the transit system employee and the transit system's dispatch services;
 - (c) an employee or contractor of a utility services provider acting within the scope of employment while responding to a utility emergency;
 - (d) an individual employed as a commercial motor vehicle driver who uses a personal electronic device within the scope of such individual's employment if such use is permitted under 49 USC 31136 as it existed on July 23, 2017; and
 - (e) a person operating an authorized emergency vehicle.
- (3) the [state/province/territory] preempts the field of regulating the use of personal electronic devices in motor vehicles while driving, and this section supersedes any local laws, ordinances, orders, rules, or regulations enacted by any political subdivision or municipality to regulate the use of a personal electronic device by the operator of a motor vehicle.
- (4) For purposes of this section,
 - (a) "Driving" means to operate a motor vehicle on a public highway, including while temporarily stationary because of traffic, a traffic control device, or other momentary delays. "Driving" does not include when the vehicle has pulled

Using a Personal Electronic Device While Driving

- (1) A person who uses a personal electronic device while driving a motor vehicle on a public highway is guilty of the crime of using a personal electronic device while driving.

* If "Automated Driving System-Equipped Vehicles" are not defined in a jurisdiction's law, a definition may be required. AAMVA defines an Automated driving system (ADS) as the hardware and software that are collectively capable of performing the entire Dynamic Driving Task on a sustained basis, regardless of whether it is limited to a specific ODD; this term is used specifically to describe a Level 3, 4, or 5 driving automation system.

over to the side of, or off, an active roadway and has stopped in a location where it can safely remain stationary.

- (b) “Personal electronic device” means any portable electronic device that is capable of wireless communication or electronic data retrieval and is not manufactured primarily for hands-free use in a motor vehicle. “Personal electronic device” includes, but is not limited to, a cell phone, tablet, laptop, two-way messaging device, or electronic game. “Personal electronic device” does not include two-way radio, citizens band radio, or amateur radio equipment.
- (c) “Use” or “uses” includes but is not limited to
 - (i) holding a personal electronic device in either hand or both hands;
 - (ii) using a hand or finger to compose, send, read, view, access, browse, transmit, save,

or retrieve email, text messages, instant messages, photographs, or other electronic data; however, this does not preclude the minimal use of a finger to activate, deactivate, or initiate a function of the device;

- (iii) watching video on a personal electronic device, other than watching data related to navigation; or
- (iv) broadcasting a video (FB Live, IG Live, and so on) unless the personal electronic device is used for the sole purpose of continuously recording or broadcasting video within or outside of the motor vehicle (dashcam) and the recording device does not require interaction from the driver while the vehicle is being driven.

OUR VISION

Safe drivers

Safe vehicles

Secure identities

Saving lives!



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