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U.S. Department of Transportation issues new Automated Driving Systems (ADS) guidance

On Sept. 12, 2017, the U.S. Department of Transportation, through the National Highway Traffic Safety Administration (NHTSA), issued new federal guidance called “Automated Driving Systems: A Vision for Safety 2.0.” The [new federal guidance](#), composed of an industry-facing section called “Voluntary Guidance” and a state-facing section called “Technical Assistance to States,” replaces the Federal Automated Policy released in 2016. This newsletter provides an overview of both sections.

This guidance will be an important roadmap for businesses interested in supplying parts and services that are integrated into the supply chain for the development of autonomous vehicles. In addition, the businesses in this market sector should be vigilant to ensure that the best practices highlighted in this guidance for legislatures regulating autonomous vehicles are followed.

Section 1: Voluntary guidance

The Voluntary Guidance, although lacking a compliance requirement or enforcement mechanism, is intended to support entities that are designing ADS for use on public roads in the United States. These entities include traditional vehicle manufacturers as well as other entities involved with manufacturing, designing, supplying, testing, selling, operating or deploying ADS, including equipment designers and suppliers; entities that outfit any vehicle with automated capabilities or equipment for testing, commercial sale and/or for use on public roads; transit companies; automated fleet operators; “driverless” taxi companies; and any other individual or entity offering services utilizing ADS technology (referred to collectively as “entities” or “industry”).

The Voluntary Guidance outlines 12 safety elements, which the NHTSA believes represents industry consensus, that are widely considered to be the most important design aspects to consider and address when developing, testing and deploying ADSs on public roads. Entities are encouraged to publish a Voluntary Safety Self-Assessment demonstrating how the 12 safety elements are being addressed. Each of these safety elements is discussed below:

- 1. System safety:** Entities are encouraged to use a systems-engineering approach with the goal of designing ADS free of unreasonable safety risks. System safety considerations should consider many factors, such as design architecture, sensors, communication failure, potential software errors, loss of traction or stability, and potential collisions with environmental objects and other road users. All system safety decisions should be tested, validated and verified as individual sub-systems and as part of the entire vehicle architecture.

- 2. Operational Design Domain:** An Operational Design Domain (ODD) defines where (e.g., road type, speed limits) and when (under what conditions such as time of day, weather, etc.) an ADS is designed to operate. Entities are encouraged to document the ODD for each ADS available on their vehicles as tested or used on public roads, as well as document the process and method for assessing, testing and validating ADS functionality with a prescribed ODD. An ADS should be able to operate safely within the ODD for which it is designed, as well as transition to a minimal risk condition if conditions dynamically change to fall outside of an ADS's ODD.
- 3. Object and Event Detection and Response:** Object and Event Detection Response (OEDR) refers to detection by the driver or ADS of any information necessary to the immediate driving task, as well as the implementation of the appropriate driver or system response to a particular circumstance. Entities are encouraged to have a documented process for assessing, testing and validating their ADS's OEDR capabilities, which should include being able to detect and respond to other vehicles, pedestrians, bicycles, animals and other objects that could affect safe operation of the vehicle.
- 4. Fallback (minimal risk condition):** Entities are encouraged to have a documented process for transition to a minimal risk condition when a problem occurs or the ADS cannot safely operate. In addition to detecting when an ADS is malfunctioning, ADS should be able to notify the human driver of an error event in a way that allows the driver to regain proper control of the vehicle or allows the ADS to return to a minimal risk condition independently.
- 5. Validation methods:** Entities are encouraged to develop validation methods to appropriately address any safety risks associated with their ADS approach. Whether testing is done by the entities themselves or by an independent third party, such testing should demonstrate the behavioral competencies an ADS would be expected to perform during normal operation, the ADS's performance during crash avoidance situations, and the performance of fallback strategies relevant to the ADS's ODD.
- 6. Human machine interface:** Entities are encouraged to consider and document a process for assessing, testing and validating the design of a vehicle's human machine interface, which refers to interactions between a vehicle's ADS and the driver.
- 7. Vehicle cybersecurity:** Entities are encouraged to follow a comprehensive product development process to minimize risks to safety from cybersecurity threats and vulnerabilities. The NHTSA encourages entities to consider and incorporate voluntary guidance, best practices and design principles from relevant organizations, such as the National Institute of Standards & Technology and the Alliance of Automobile Manufacturers.
- 8. Crashworthiness:** Entities are encouraged to consider how to best protect vehicle occupants during a crash. Entities should also evaluate and implement countermeasures to protect occupants and maintain an ADS's intended performance level during this event.
- 9. Post-crash ADS behavior:** Entities are encouraged to consider how to return ADSs to a safe state immediately after being involved in a crash. Additionally, entities should consider having documentation available that facilitates the maintenance and repair of ADSs before they can be put back into service.
- 10. Data recording:** Entities are encouraged to establish a documented process for testing, validating and collecting necessary information related to the occurrence of ADS malfunctions, degradations or failures in a way that can be used to establish the cause of any crash.
- 11. Consumer education & training:** Entities are encouraged to develop, document and maintain employee, dealer, distributor and consumer education and training programs to inform the public regarding differences in the use and operations of ADS from those of the conventional vehicles owned and operated on the road today.
- 12. Federal, state and local laws:** Entities are encouraged to document how they intend to account for all applicable federal, state and local laws in the design of their vehicles and ADS.

Section 2: Technical assistance to states

This section is designed to clarify and frame federal and state roles in the regulation of ADS and lay out a framework that states may use in creating applicable laws and regulations. States are encouraged to proactively assess current laws and regulations to avoid creating barriers to ADS operation. This section consists of three parts:

- 1. Federal and state regulatory roles:** In general, the NHTSA is responsible for regulating motor vehicles and motor vehicle equipment, and states are responsible for regulating the human driver and most other areas of motor vehicle operation. NHTSA responsibilities have historically involved setting Federal Motor Vehicle Safety Standards (FMVSSs) for new motor vehicles and motor vehicle equipment, enforcing compliance with FMVSSs, investigating and managing the recall and remedy of noncompliances and safety-related motor vehicle defects nationwide, and communicating with and educating the public about motor vehicle safety issues. State responsibilities have historically involved licensing drivers, enacting and enforcing traffic laws and regulations, conducting safety inspections, and regulating motor vehicle insurance and liability. These areas of regulatory responsibility should remain largely intact for ADSs.
- 2. Best practices for legislatures:** The NHTSA has identified common components of state legislation regarding ADS and recommends the following safety-related best practices for states when crafting ADS legislation.
 - *Provide a “technology-neutral” environment:* States should not place unnecessary burdens on competition and innovation by walling off ADS testing or deployment to motor vehicle manufacturers only.
 - *Provide licensing and registration procedures:* Because states are responsible for driver licensing and vehicle registration procedures, states should consider defining “motor vehicle” to include any ADS-equipped vehicle operating on state roads and highways, licensing ADS entities and ADS test operators, registering all vehicles equipped with ADS, and establishing proof of responsibility requirements in the form of surety bonds or self-insurance.
 - *Provide reporting and communications methods for public safety officials:* States should take steps to monitor ADS operation through reporting and communications protocols so that entities can coordinate with public safety agencies.
 - *Review traffic laws and regulations that may serve as barriers to operation of ADS:* States should review their vehicles codes and applicable traffic laws to determine if there are unnecessary regulatory barriers preventing the testing and deployment of ADS on public roads.
- 3. Best practices for state highway safety officials:** The following subsections are designed to assist states looking for guidance in developing procedures and conditions for ADS introduction onto public roads.
 - *Administrative:* States may wish to consider new oversight activities to support states’ roles and activities as they relate to ADS. These activities include, but are not limited to, identifying a lead agency responsible for deliberation of any ADS testing; developing an internal process for issuing test ADS vehicle permits; and creating a technology committee composed of representatives from various departments of state government, particularly those representing transit authorities and the aging and disabled communities.
 - *Application for entities to test ADS on public roadways:* States could request that an entity submit an application to the designated lead agency in each state in which the entity plans to test ADS. This application could contain basic information (such as name, corporate physical and mailing addresses, etc.); the entity’s safety and compliance plan for the ADS; evidence of the entity’s ability to satisfy judgment(s) for personal injury, death or property damage caused by an ADS; and a summary of the training given to the employees, contractor and users designated by the entity as ADS test operators

- *Permission for entities to test ADS on public roads:* State and local governments may consider the following before granting permission for ADS testing on public roads: involving law enforcement agencies before responding to a particular testing application, suspending permission if the entity fails to comply with insurance or driver requirements, and requesting additional information or requiring an entity to modify its application before granting approval.
- *Specific considerations for ADS test drivers and operations:* States should consider requiring entities that use ADS test drivers to provide a summary of the training provided to the test driver, encourage test drivers to follow and traffic rules and report crashes, and ensure that licensed test drivers can responsibly operate ADS-equipped vehicles even if the automated system disengages.
- *Considerations for registration and titling:* States should consider specific identification and titling requirements for ADS-equipped vehicles, as well as notification requirements if the vehicle has been significantly upgraded post-sale.
- *Working with public safety officials:* States should consider training public safety officials in monitoring and understanding ADS operation and potential interactions, including human operator behavior changes – if any – when an ADS-equipped vehicle is in control.
- *Liability and insurance:* States should consider how to allocate tort liability among ADS owners, operators, passengers, manufacturers and other entities when a crash occurs, and determine who (ADS owner, operator, passenger, manufacturer, etc.) must carry motor vehicle insurance.

Concluding comment

The era of the development of autonomous vehicles is moving faster than anyone could have predicted a few years ago. Businesses interested in product development need to stay abreast of standards and guidances that are emerging for this sector. Members of the Environmental and Energy Strategies Practice Groups at Godfrey & Kahn are investing significant time in monitoring these developments. Please feel free to reach out to any member of the team for more information on legal developments in this market sector.

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