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August 28, 2019

The Honorable James Owens, Deputy Administrator
National Highway Traffic Safety Administration
U.S. Department of Transportation
1200 New Jersey Avenue, SE
Washington, DC 20590

RE: Removing Regulatory Barriers for Vehicles with Automated Driving Systems (NHTSA-2019-0036)

Dear Deputy Administrator Owens:

AAA appreciates the opportunity to provide input as the National Highway Traffic Safety Administration (NHTSA) focuses on Automated Driving System-Dedicated Vehicles (ADS-DVs) without manual controls and considers how to address regulatory barriers. The key perspective AAA wants to emphasize during a discussion of automated vehicle technology is that the government should proceed deliberately and with care when considering changes to Federal Motor Vehicle Safety Standards (FMVSS). NHTSA should allow these potentially safety-enhancing technologies to be researched and developed, tested, refined, and then only widely deployed on public roads when regulators have been provided enough proof by the industry that these technologies can operate at least as safe as their human driven counterparts.

With regard to vehicle design for safe operation, NHTSA notes in the Advanced Notice of Proposed Rulemaking (ANPRM) that it has previously issued a Request for Comment (RFC) regarding those FMVSS that may pose barriers for the design, testing and deployment of vehicles with high and full driving automation. AAA responded to that RFC¹, stating that the current standards have been developed over time to protect consumers and as a result, they should not be readily discarded. Furthermore, AAA recommended that NHTSA should put the burden on commenters to justify why a particular standard is no longer applicable to automated vehicles. If the commenter does not meet this burden, NHTSA should maintain the current rule.

In the current ANPRM, the agency attempts to narrow the scope of inquiry to better understand how to amend the FMVSS to safely permit ADS-DVs without traditional manual

¹AAA Comments submitted March 20, 2018 <https://www.regulations.gov/document?D=NHTSA-2018-0009-0068>

controls.² As an overarching matter, AAA strongly endorses the statement in the ANRPM that “NHTSA believes that safety should be the preeminent consideration when evaluating whether and how the test methods discussed in this document could be used to address regulatory barriers to ADS-DVs.” ANRM at Fed. Reg. 24434. In addition to addressing the safe introduction of ADS-DVs from a testing perspective, AAA urges NHTSA to also ask commenters and vehicle developers how an ADS will communicate operational information with its occupants should the 100 series FMVSS be revised. Occupant awareness of key operational information should be part of the discussion on safety. In addition, as with the previous request for comment, AAA still believes commenters should be required to adequately justify why, and how, a standard should be updated. To remove or revise a safety standard without this convincing evidence would be arbitrary. We expect NHTSA to clearly explain the justification in changing or eliminating an FMVSS in a final rulemaking.

Vehicle Information and Interface

When considering revisions to the 100 series FMVSS, we urge NHTSA to maintain requirements for standards that relay operational information and allow the occupants to interface with the system, since it is too soon to discard these safety and confidence-enhancing standards. Examples of these standards include:

- FMVSS No. 101³: “Controls and Displays” specifies performance requirements for location, identification, color, and illumination of motor vehicle controls, telltales and indicators. The purpose of this standard is to ensure the accessibility, visibility and recognition of motor vehicle controls. This standard includes horn control and display of visible messages to the driver such as lights, hazard warning, turn signal and battery.
- FMVSS No. 108⁴: “Lamps, reflective devices, and associated equipment” specifies requirements for original and replacement lamps, reflective devices, and associated equipment. This includes the vehicular hazard warning signal operating unit, which is a driver-controlled device, and causes all required turn signal lamps to flash simultaneously to indicate to approaching drivers the presence of a vehicular hazard.
- FMVSS No. 111⁵: “Rear Visibility” specifies performance requirements to improve the ability to see areas to the rear of a motor vehicle in order to mitigate fatalities and injuries associated with back-over incidents. Additionally the standard specifies requirements for a rearview

²Removing Regulatory Barriers for Vehicles With Automated Driving Systems, NHTSA, 83 FR. P.24433-24449, May. 28, 2019, NHTSA-2019-0036; (Notice).

³Title 49.Subtitle B.Chapter V.Part 571.Subpart B §571.101 Standard No. 101; Controls and displays. Retrieved from: https://www.ecfr.gov/cgi-bin/retrieveECFR?gp=&SID=052746084f08b6e544ef104ba5179c1a&mc=true&n=sp49.6.571.b&r=SUBPART&ty=HTML#se49.6.571_1101

⁴Title 49.Subtitle B.Chapter V.Part 571.Subpart B §571.108 Standard No. 108: Lamps, reflective devices, and associated equipment. Retrieved from: https://www.ecfr.gov/cgi-bin/retrieveECFR?gp=&SID=052746084f08b6e544ef104ba5179c1a&mc=true&n=sp49.6.571.b&r=SUBPART&ty=HTML#se49.6.571_1101

⁵ Title 49.Subtitle B.Chapter V.Part 571.Subpart B §571.111 Standard No. 111; Rear visibility. Retrieved from: https://www.ecfr.gov/cgi-bin/retrieveECFR?gp=&SID=052746084f08b6e544ef104ba5179c1a&mc=true&n=sp49.6.571.b&r=SUBPART&ty=HTML#se49.6.571_1101

image detected by a single source, of the area directly behind a vehicle that is provided in a single location to the vehicle operator and by means of indirect vision.

While the identified standards were initially drafted to aid drivers, the information these features provide will still be important to occupants of ADS-DV. AAA believes that consumers will want and expect information regarding the critical safety systems of an autonomous vehicle, so that they can make an informed choice regarding their use of the vehicle. We note that features described above may seem purely operational, but they actually serve safety needs. For example, while the fuel gauge/battery capacity may not seem directly safety-related, a low fuel or battery charge warning could help a vehicle occupant inform the AV operator and avoid a safety incident. All such mission-critical features should therefore be maintained.

In addition to better understanding how occupants will gather information about the ADS-DVs, AAA believes the agency should also consider maintaining a means for the occupant to interface with the vehicle, understand the controls and displays and alert others, including non-automated vehicles and pedestrians. For example, without a horn or other means to alert other vehicles, pedestrians and bicyclists, an automated vehicle may pose a safety risk to itself and others. A good example of this was discovered during AAA NCNU's Las Vegas shuttle pilot test, when a delivery truck backed into the shuttle. Recently, the National Transportation Safety Board (NTSB) determined:

“that the collision happened after the shuttle turned from Carson Avenue onto South 6th Street, where the truck was backing into an alley. The truck driver said he saw the shuttle turn onto 6th Street and assumed it would stop a ‘reasonable’ distance from the truck. Prior to the collision the hand-held controller for manual operation [of the shuttle] was stored in an enclosed space at one end of the passenger compartment and the attendant did not retrieve the controller during the event. NTSB specified that ‘the truck driver’s actions and the autonomous vehicle attendant’s lack of easy access to a manual controller are cited in the probable cause for the collision.’”⁶

The NTSB noted further that, “as a vehicle designed primarily for autonomous operation, the shuttle did not have a steering wheel, a brake, or an accelerator pedal. Its design permitted manual operation, however, using a hand-held controller. Pressing the “operator presence” button on the controller would activate manual mode. In addition to steering the shuttle, the controller could engage the emergency brake, horn, or buzzer; open or close the doors; or activate the turn signals. Pressing both turn signal buttons would activate the hazard warning lights. Releasing the control button would activate the emergency brake.”

Before the crash, which was on the first day of the shuttle’s operation, the controller was stored in an enclosed space at one end of the passenger compartment, and was not easily accessible by the shuttle’s attendant. After the crash, operational procedures were changed so that the shuttle’s attendant would remove the controller from its storage space at the beginning of a trip and have it accessible throughout the trip.

⁶ Ibid.

The ANPRM itself highlights the importance of an occupant's ability to interface with the vehicle. Specifically, the ANPRM states that in order to test an ADS-DV Operation approach for compliance verification it will be "essential to understand how operators will interface and operate these ADS-DVs without traditional manual controls under normal conditions." AAA believes that the lessons learned from the Las Vegas shuttle incident prove that there is still a need for occupant intervention and interface with the automated system and that NHTSA should thoroughly consider how revising or eliminating FMVSS might negatively affect ADS-DVs' occupants and their safety. If NHTSA determines that ADS-DVs do not have to retain certain displays and controls, hazard warning signal flashers and rear visibility features, AAA strongly urges NHTSA to justify the change in policy and identify alternative means for occupants to obtain this important information and interface with the system in an emergency. AAA recommends the agency continue to study the use of vehicle indicators by occupants, pedestrians and other vehicles (traditional and highly automated) before revising or eliminating standards.

Because the safety performance of ADS-DV is of concern regardless of whether it is operating an FMVSS-compliant or non-compliant vehicle, AAA recommends that NHTSA build upon its efforts and initiate a rulemaking to regulate the safety of ADS-DVs, in accordance with its automation principles. A regulatory framework is needed to strengthen and formalize the voluntary guidance provided thus far given that ADSs have already been deployed in a number of vehicles in several states, and ADS developers intend to deploy their ADSs on a wider range of vehicles in the future.

Continued Data and Research Needs

Since 1902, AAA has advocated for transportation safety on behalf of consumers. In addition to this advocacy, AAA has a history of promoting safety through research.. To help inform all road users, AAA tests and evaluates emerging vehicle technologies, including automated vehicle features.^{7,8} The AAA Foundation for Traffic Safety (AAAFTS) is also actively involved with a variety of stakeholders on automated vehicle issues and has many recent and ongoing research projects examining driver perceptions and understanding of, and their interactions with, new in-vehicle technology. Additionally, the AAAFTS co-hosted forums in 2017 and 2018 on the impact of vehicle technology and automation on road users, attended by representatives from the automobile and technology industries, government, private research facilities, and university technology centers.

⁷ AAA. (2019). *Advanced Driver Assistance Technology Names: AAA's recommendation for common naming of advanced safety system*. Retrieved from: <https://www.aaa.com/AAA/common/AAR/files/ADAS-Technology-Names-Research-Report.pdf>

⁸ AAA. (2018). *Level Two Autonomous Vehicle Testing: AAA propriety research into the performance of SAE Level 2 autonomous systems*. Retrieved from: <https://newsroom.aaa.com/2018/11/americans-misjudge-partially-automated-driving-systems-ability-based-upon-names/>

Summary reports of the 2017 forum⁹ and the 2018 forum¹⁰ are available to the public. A third forum is planned for November 2019¹¹. Some AAA clubs are hosting similar education forums on autonomous vehicles and the future of transportation in several states.

Based on AAA FTS work bringing together stakeholders to discuss issues of automated vehicles, we have several suggestions for areas that still need to be explored. In particular, research is needed in the following areas: (1) how drivers perceive and how they understand the automated system with which they are interacting (the driver's "mental model"); (2) consumer education and training regarding automated systems; and (3) automated system design, especially of the human-machine interface. These research needs will be best met if a variety of stakeholders are involved.

Additionally, NHTSA notes its contract with Virginia Tech Transportation Institute to identify possible modifications to the current FMVSS regulatory text and test procedures that would both maintain safety and ensure regulatory certainty for manufacturers of ADS-DVs without traditional manual controls.¹² Before revising or eliminating current FMVSS or proposing new standards for ADS vehicles, AAA recommends that NHTSA wait until the findings of the VTTI analysis are completed and shared with safety stakeholders, industry and the research community.

AAA clubs have followed suit in research efforts, embarking on testing initiatives involving AVs that may inform the ANPRM. Some examples include:

- AAA Northern California, Nevada and Utah (NCNU):
 - Collaborated with the City of Las Vegas to introduce the nation's first autonomous shuttle available to the public.¹³
 - Partnered with Torc Robotics to examine AV safety assessment criteria¹⁴ and to test an AV against such criteria.¹⁵
 - Operates GoMentum Station, one of the largest AV testing facilities in the U.S., where comprehensive closed-track testing can take place and vehicle and infrastructure technologies can be evaluated.¹⁶
 - Hosted a workshop in March 2019 on safety metrics for ADS-equipped vehicles. In this workshop, participants discussed how AV safety metrics should be valid, reliable, feasible, and non-manipulatable.

⁹ AAA Foundation for Traffic Safety (2018). 2017 Forum on the Impact of Vehicle Technologies and Automation on Users: A Summary Report. AAA Foundation for Traffic Safety. Retrieved from: <http://aaafoundation.org/2017-forum-impact-vehicle-technologies-automation-users-summary-report/>

¹⁰ AAA Foundation for Traffic Safety (2019). 2018 Forum on the Impact of Vehicle Technologies and Automation on Vulnerable Road Users and Driver Behavior and Performance: A Summary Report. AAA Foundation for Traffic Safety. Retrieved from: <https://aaafoundation.org/2018-forum-on-the-impact-of-vehicle-technologies-and-automation-on-vulnerable-road-users-and-driver-behavior-and-performance-a-summary-report/>

¹¹ <http://www.aaa.biz/Conference/2019FoundationForum/2019Forum.htm>

¹² Removing Regulatory Barriers for Vehicles With Automated Driving Systems, NHTSA, 83 FR 224433. P.24433-24449, May. 28, 2019, NHTSA-2019-0036; (Notice).

¹³ <http://www.AAA NCNUhophonlasvegas.com/>

¹⁴ <https://torc.ai/aaa-partners-torc-robotics-on-self-driving-car-safety-criteria/>

¹⁵ <https://torc.ai/torc-and-aaa-northern-california-nevada-utah-run-self-driving-car-through-hazardous-traffic-scenarios/>

¹⁶ <http://gomentumstation.net/aaa-and-gomentum-station-announce-exclusive-partnership-agreement/>

- Currently undertaking a project to more specifically describe the GoMentum test facility's operational design domain (ODD), both qualitatively and quantitatively. The objective is to show where and how an ODD can conform to test procedure requirements.
- Developing a high-definition map of GoMentum to enable customers to test their automated vehicles more efficiently and accurately.
- Automobile Club of Southern California – Automotive Research Center (ARC) in collaboration with AAA Automotive Engineering:
 - Tested Level 2 automated vehicles to better understand the capabilities and limitations of these vehicles and published results to inform AAA members and the motoring public.
 - Tested individual ADAS technologies including blind-spot warning, rear cross-traffic warning, adaptive cruise control, and forward automatic emergency braking, and published the result to educate AAA members and the motoring public on system capabilities.

Conclusion

In closing, AAA agrees that “safety should be the primary focus of [NHTSA’s] efforts to address barriers to ADS-DVs” ANRPM at Fed. Reg. 24437. AAA submits these comments to enhance the shared goal of continuing to focus on the safe testing and deployment of automated vehicles. The FMVSS development process is an important function of NHTSA that the American public relies on to ensure that new vehicle technologies are safe, self-certified by auto manufacturers, and reflect the latest advances in the automotive industry. AAA recognizes that this goal can be attained in a number of ways. It may be that certain FMVSS can be reinterpreted, rather than revised, but only so long as the change is fully justified. Any modifications to the FMVSS identified should continue to provide information to vehicle occupants and allow them to interface with the ADS-DV system in order to maintain safety. NHTSA should proceed deliberately and keep the statutory goal of protecting consumers in primary focus as it considers the comments.

Sincerely,



Jill Ingrassia
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