April 1, 2021

The Honorable Steve Cliff, Acting Administrator
National Highway Traffic Safety Administration
U.S. Department of Transportation
1200 New Jersey Avenue, SE
Washington, DC 20590

RE: Framework for Automated Driving System Safety [Docket No. NHTSA–2020–0106]

Dear Acting Administrator Cliff:

AAA appreciates the opportunity to provide comment on the agency's Framework for Automated Driving System Safety. With more than 61 million members, AAA is a not-for-profit member services organization dedicated to advancing safe mobility and associated technologies. Similar to other stakeholders in this space, we are excited about the future of automation and the potential safety benefits and mobility options that it represents. However, as new technologies are developed and tested on public roads, we encourage NHTSA to approach the performance evaluation of Automated Driving Systems (ADS) through a rigorous safety framework, containing a variety of approaches and mechanisms, that supports regulators and policymakers in identifying and managing safety risks related to ADS deployment in an appropriate manner.

Currently, NHTSA requests Voluntary Safety Self-Assessments (VSSA) from industry that outline key safety considerations for ADS. While these documents have provided critical information to the public on how safety is being addressed during the development of ADS, they lack sufficient details on testing results and vehicle design considerations being contemplated. In order to more fully inform the public of safety parameters put into place for ADS, future efforts should mandate that safety self-assessments be issued before an ADS developer tests on public roads. Moreover, NHTSA should mandate that testing results be made available to the public for review to create a feedback process that allows the public and industry stakeholders the opportunity to address key concerns that arise from the data.

As NHTSA develops its safety framework, it should work in conjunction with private industry, academia and standards bodies to sponsor research to develop authoritative methods for safety assurance of ADS, including a layered set of complementary test settings in simulation, test track and on-road testing, wherein each setting progressively validates the functionality and safety with greater fidelity, as suggested in Koopman and Wagner.[1] Safety assurance programs should be stakeholder- and technology-neutral, and be applied to all stakeholders who seek to test or deploy ADS and ADS-equipped vehicles. Data from ADS safety assurance programs should be made available in a consistent format for validation by independent third-parties. We note that a "testing regime" by manufacturers and/or third-parties incorporating simulation testing, closed-track testing, and on-road testing is complementary and that no one form of test setting alone is enough to make a credible safety argument. Thus, ADS developers should be required to develop and submit explicit explanations and data to NHTSA and the public, detailing:

- The methodical exposure of the ADS to all expected driving maneuvers under all expected driving

---

[1] Koopman and Wagner, Toward a Framework for Highly Automated Vehicle Safety Validation, 2018 SAE World Congress, SAE 2018-01-1071.

conditions in the vehicle's operating environment, demonstrating the behavioral competencies of the ADS.

- The object and event detection and response (OEDR) capabilities of the highly automated vehicle, noting the ADS performance and identifying situations requiring supervisor intervention ("disengagement").
- Iterative testing of scenarios, identifying edge cases that challenge ADS, recreating such edge cases in closed-course, and re-testing in the real-world.

NHTSA should place the burden on an ADS developer to explain (a) why the ADS behaves in a certain manner when subject to external objects and or events, (b) how a consumer will interact with the new technology, and (c) the safety benefit of removing traditional vehicle features, if requested by an ADS developer. Requiring vehicle developers to provide this data will aid NHTSA and the public in considering when and how to use the vehicles and could ultimately help inform the development of future federal safety standards and promote industry learnings that ensure the safe deployment of ADS vehicles on our nation's roads.

NHTSA should also encourage developers to consider scenario testing informed by various standards organizations and regulatory bodies, including EuroNCAP, ISO, SAE, the U.S. Department of Defense, and NHTSA's own Framework for Automated Driving System Testable Cases and Scenarios. It may also be beneficial for NHTSA to evaluate ADS competency and safety under the New Car Assessment Program (NCAP). The advanced notice of public rulemaking states that "while an FMVSS obstacle-course performance test, standing alone, would likely be inadequate to evaluate ADS competence, such a test might form a useful foundation for consumer information under the NCAP program."[2] AAA agrees that this could be a beneficial undertaking, but believes an evaluation under the NCAP program should be considered as a compliment to setting safety standards for ADS and not a replacement.

Additionally, ADS manufacturers should notify NHTSA about the changes to the vehicle's capabilities before it is deployed on public roads during pilot programs. This recommendation coincides with recommendations from the National Transportation Safety Board, which also recommended that NHTSA require AV developers submit a safety self-assessment report to the agency after its investigation of the 2018 Uber AV test vehicle crash.[3] The report to NHTSA should also include explanations of updates to the software that enables the ADS. Further, the vehicle manufacturer should perform additional testing to ensure that the vehicle's safety case is maintained or enhanced as new functionality is added or existing functionality is repaired. Among these considerations, NHTSA may also want to seek information from a developer that shows the vehicle's overall safety case is maintained should vehicle capabilities evolve.

AAA believes consumer education is critical to enhancing safe ADS development and deployment. Examples of AAA and the AAA Foundation for Traffic Safety's consumer-focused contributions to date that NHTSA may find useful when developing its safety framework are outlined below:

---

[2] Framework for Automated Driving System Safety, NHTSA, Federal Register Vol. 85, No. 233. P. 78067-78068, December 3, 2020, Docket No. NHTSA-2020-0106; (Notice).
[3] https://www.ntsb.gov/news/press-releases/Pages/NR20191119c.aspx

NHTSA, Framework for Automated Driving System Safety
April 1, 2021

- Since 2014, AAA has tested elements that are considered to be the building blocks of automated vehicles: blind spot warning[4], lane departure warning/lane keeping assistance[5], automatic emergency braking[6], active parking assistance[7], and adaptive cruise control[8].
- In 2018, AAA conducted primary research to characterize the performance of SAE International Level 2 autonomous vehicle (AV) systems available in the United States.
- In 2019, AAA released research on advanced driver assistance systems (ADAS) and proposed terminology that is intended to be simple, specific and based on system functionality.[9]
- In 2019, in partnership with the Automobile Club of Southern California's Automotive Research Center, AAA released research that found that automatic emergency braking systems with pedestrian detection perform inconsistently, and proved to be completely ineffective at night.[10]
- In 2019, AAA, Consumer Reports, J.D. Power and the National Safety Council came together to adopt standardized naming for ADAS technology in an effort to reduce confusion.[11] In 2020 the U.S. Department of Transportation[12], SAE[13], and PAVE[14] also endorsed the ADAS common naming effort.
- In 2020, AAA, in partnership with the Automobile Club of Southern California's Automotive Research Center and AAA Northern California, Nevada and Utah's GoMentum Proving Grounds tested vehicles with active driving assistance on both closed-course routes and naturalistic driving.[15]
- Later in 2021, AAA plans to release new research that evaluates driver monitoring systems that will support Level 2 automation. When released, AAA can provide a briefing on the effort if requested.

**The AAA Foundation for Traffic Safety:**
- Co-hosted forums in 2017[16], 2018[17], and 2019[18] 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 transportation centers.
- In 2019, released research examining driver behavior when driving vehicles equipped with ADAS,

---

[4] AAA Advises Drivers to Know the Limits When Using Blind Spot and Lane Departure Systems. (2014). Retrieved from: https://newsroom.aaa.com/2014/12/new-car-technologies-still-working-kinks-says-aaa-assessment/
[5] Ibid.
[6] AAA Tests Reveal Automatic Emergency Braking Systems Vary Significantly. (2016). Retrieved from: https://newsroom.aaa.com/2016/08/hit-brakes-not-self-braking-cars-designed-stop/
[7] AAA finds self-parking technology lacks consumer trust, outperforms drivers. (2015). Retrieved from: https://newsroom.aaa.com/2015/09/americans-steer-away-from-autonomous-parking/
[8] AAA study reveals that lack of experience with advanced systems could put motorists at risk. (2014) Retrieved from: https://newsroom.aaa.com/2014/05/automated-vehicle-systems-not-a-substitute-for-driver-engagement/
[9] Advanced Driver Assistance Technology Names: AAA's Recommendations for Common Naming of Advanced Safety Systems. Retrieved from: https://newsroom.aaa.com/2019/01/common-naming-for-adas-technology/
[10] Automatic Emergency Braking With Pedestrian Detection. Retrieved from: https://newsroom.aaa.com/2019/10/aaa-warns-pedestrian-detection-systems-dont-work-when-needed-most/
[11] Clearing Up The Confusion: Recommended Common Naming Advanced Driver Assistance Technologies. Retrieved from: https://newsroom.aaa.com/2019/11/aaa-consumer-reports-j-d-power-and-the-national-safety-council-unite-to-adopt-common-naming-for-advanced-driver-assistance-technology/
[12] https://www.transportation.gov/briefing-room/us-transportation-secretary-elaine-l-chao-announces-new-initiatives-improve-safety
[13] https://newsroom.aaa.com/2020/05/sae-endorses-adas-common-naming-effort-led-by-aaa-consumer-reports-j-d-power-and-the-national-safety-council/
[14] PAVE endorses initiative to promote common naming for advanced driver assistance systems. (2020). Retrieved from: https://pave-campaign.org/pave-endorses-initiative-by-safety-groups-to-promote-common-naming-for-advanced-driver-assistance-systems/
[15] AAA. (2020). AAA Finds Active Driving Assistance Systems Do Less to Assist Drivers and More to Interfere. Retrieved from: https://newsroom.aaa.com/2020/08/aaa-finds-active-driving-assistance-systems-do-less-to-assist-drivers-and-more-to-interfere/
[16] 2017 Forum on the Impact of Vehicle Technologies and Automation on Users: A Summary Report https://aaafoundation.org/2017-forum-impact-vehicle-technologies-automation-users-summary-report/
[17] 2018 Forum on the Impact of Vehicle Technologies and Automation on Vulnerable Road Users and Driver Behavior and Performance: A Summary Report 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/
[18] 2019 Forum on the Impact of Vehicle Technologies and Automation on Users – Design and Safety Implications: A Summary Report https://aaafoundation.org/2019-forum-on-the-impact-of-vehicle-technologies-and-automation-on-users-design-and-safety-implications-a-summary-report/

Page 4

NHTSA, Framework for Automated Driving System Safety
April 1, 2021

such as adaptive cruise control or lane-keeping assistance.

- In 2019, released research examining people's perceptions and expectations of AV technologies.[19]
- In 2020, released research examining how the quality of a driver's understanding of advanced vehicle technology, also known as a mental model, impacts his or her performance and safety.[20]

In closing, NHTSA must ensure that safety remains paramount as it develops a framework for evaluating ADS-equipped vehicles. The development process should be robust, leveraging existing understanding of how to approach vehicle testing and deployment. The American public expects NHTSA to assist state and local jurisdictions, ADS developers and other manufacturers in introducing safe vehicles into the market. NHTSA must safeguard the trust American motorists place in it; without it, the federal government will be unable to deliver on its mandate to keep our nation's roads safe.

Sincerely,

Jill Ingrassia
Executive Director
AAA Advocacy & Communications

---

[19] Kim, W., Kelley-Baker, T., Sener, I., Zmud, J., Graham, M. & Kolek, S. (2019). Users 'Understanding of Automated Vehicles and Perception to Improve Traffic Safety –Results from a National Survey. AAA Foundation for Traffic Safety. Retrieved from: https://aaafoundation.org/users-understanding-of-automated-vehicles-and-perception-to-improve-traffic-safety-results-from-a-national-survey/

[20] Gaspar, J. , Carney, C., Shull, E. & Horrey, W.J. (2020). The Impact of Driver's Mental Models of Advanced Vehicle Technologies on Safety and Performance. AAA Foundation for Traffic Safety. Retrieved from: https://aaafoundation.org/the-impact-of-drivers-mental-models-of-advanced-vehicle-technologies-on-safety-and-performance/