Washington Office
607 14th Street, NW, Suite 200
Washington, D.C. 20005
202/942-2050
FAX: 202/783-4788

March 6, 2020

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

RE: Advanced Driver Assistance Systems Draft Research Test Procedures [Docket No. NHTSA–2019–0102]

Dear Acting Administrator Owens:

AAA appreciates the opportunity to review and provide feedback on NHTSA's draft research test procedures developed to assess the performance of certain types of Advanced Driver Assistance Systems (ADAS) available to consumers. As consumer interest in and adoption of ADAS technologies grow, understanding the effectiveness of these technologies and how consumers engage with them will be critical to maximizing their potential life-saving benefits. Ensuring that the testing procedures are designed to capture the most useful information for assessing ADAS technologies is an important first step, and AAA applauds NHTSA's effort to invite the public to review and provide feedback before this important publically-funded research is undertaken.

Recognizing the importance of testing new ADAS technologies available in the market, AAA has undertaken ADAS research since 2014. Over the past six years, AAA has tested blind spot warning and lane departure warning/lane keeping assistance[1], automatic emergency braking[2], pedestrian detection[3], adaptive cruise control[4], and crash-avoidance ADAS systems[5]. The goal of our research agenda is to educate drivers on the safety benefits and limitations of these applications and to provide feedback to the automotive industry. Additionally, the AAA Foundation for Traffic Safety has long been recognized as a leader in traffic safety, and expanded its scope with a focus on four research priorities: driver behavior and performance; emerging technologies; roadway systems and drivers; and vulnerable road users.

While conducting AAA's research, our Automotive Engineering team has gained extensive experience in how to design and execute effective ADAS research projects that deliver insightful results for consumers, policymakers, and technology developers. Based on our expertise and lessons from the research, we offer NHTSA the following recommendations as the agency designs its tests:

[1] https://newsroom.aaa.com/2014/12/new-car-technologies-still-working-kinks-says-aaa-assessment/
[2] https://newsroom.aaa.com/2016/08/hit-brakes-not-self-braking-cars-designed-stop/
[3] https://newsroom.aaa.com/2019/10/aaa-warns-pedestrian-detection-systems-dont-work-when-needed-most/
[4] https://newsroom.aaa.com/2014/05/automated-vehicle-systems-not-a-substitute-for-driver-engagement/
[5] https://newsroom.aaa.com/2018/11/americans-misjudge-partially-automated-driving-systems-ability-based-upon-names/

Automatic Emergency Braking with Pedestrian Detection[6]

- From reviewing the draft test procedures, it is unclear why it is specified that pedestrians do not articulate while testing. This functionally is specifically included by 4active to be as realistic as possible and included in EuroNCAP. In our automatic emergency braking with pedestrian detection[7] testing, we wanted to ensure that the test scenarios were as realistic as possible. We choose to use 4active PA articulated adult and child pedestrian targets because the articulated "legs" of the target realistically mimic a walking motion as the dummy moves along the roadway. This closely simulates a typical pedestrian in terms of radar, infrared and camera detection as well as a humanlike Micro Doppler spread. As a result, **we recommend that the agency enable this functionality**.
- IIHS and EuroNCAP do not require the test driver to remove their foot from the accelerator when a warning is presented. We **recommend this requirement be removed** because depending on the timing of the warning, the vehicle may approach the target at differing speeds rather than a consistent approach at the nominal test speed. During our testing of pedestrian detection systems, AAA found that some systems offered a warning several seconds before impact without providing any significant braking.
- 10 mph is very slow and unrealistic in the majority of urban environments and does not represent a scenario where pedestrian fatalities are likely. AAA testing evaluated the same technology with approach speeds of 20 and 30 mph. These speeds were evaluated because they are representative of speed limits on urban and suburban roadways with significant pedestrian traffic.[8] We recommend that NHTSA **increase the approach speed to 20-30 mph to match real-world conditions where pedestrians can encounter increased risk of severe injuries**.[9]
- Last year, NHTSA released highway crash fatality data for 2018, showing an increase in fatalities among pedestrians by 3.4 percent (to 6,283). Additionally, NHTSA notes that "pedestrian fatalities occurred overwhelmingly after dark (76 percent), when many pedestrians had some alcohol in their systems (38 percent), and were not at intersections (74 percent; i.e., crossing in the middle of a street or road)."[10] AAA evaluated the performance of pedestrian detection technology at nighttime and found the tested systems to be ineffective within a low-ambient light environment. This test illustrated that drivers must not rely on assistance from current pedestrian detection systems during nighttime driving or other environments with reduced visibility.[11] AAA believes that **nighttime testing remains a challenge for these systems and should be considered as a scenario in the agency's Automatic Emergency Braking with Pedestrian Detection tests**.
- Previous work by the Volpe Transportation Center identified prominent pre-crash vehicle/pedestrian scenarios in terms of frequency and injury severity.[12] Specifically, a

---

[6] https://www.regulations.gov/document?D=NHTSA-2019-0102-0005
[7] https://newsroom.aaa.com/2019/10/aaa-warns-pedestrian-detection-systems-dont-work-when-needed-most/
[8] Ibid.
[9] https://aaafoundation.org/impact-speed-pedestrians-risk-severe-injury-death/?highlight=pedestrian%20risk%20fatality
[10] National Center for Statistics and Analysis. (2019, October). 2018 fatal motor vehicle crashes: Overview. (Traffic Safety Facts Research Note. Report No. DOT HS 812 826). Washington, DC: National Highway Traffic Safety Administration.
[11] https://newsroom.aaa.com/2019/10/aaa-warns-pedestrian-detection-systems-dont-work-when-needed-most/
[12] M. Yanagisawa, E. Swanson, P. Azeredo and W. Najm, "Estimation of potential safety benefits for pedestrian crash avoidance systems," National Highway Traffic Safety Administration, 2017.

vehicle making a right turn while a pedestrian crosses the road the vehicle is turning into was the second-most implicated pre-crash scenario, trailing only perpendicular crossing situations. AAA evaluated the effectiveness of pedestrian detection systems in this type of scenario and found when a pedestrian target was located immediately after a right curve, all test vehicles failed to apply any degree of automatic braking.[13] This demonstrates that evaluated pedestrian detection systems were not designed to react to pedestrians when the vehicle is traveling in a curvilinear motion. That is why **we also recommend testing around a curve to represent a common pedestrian scenario**.

Traffic Jam Assistance[14]

- The draft testing procedures specify that the test driver shall not place hands on the steering wheel. Since this will cause some systems to disengage and render the test invalid, we **recommend that NHTSA reconsider this restriction on test drivers**.
- Since the farthest setting for following distance may create an excessively large separation distance that is not representative of normal driving, we recommend that the agency **shorten the distance to recreate a real-life driving experience**.
- 15 mph and 25 mph are too slow considering the highway environment most Traffic Jam Assistance systems are designed for, so AAA recommends that the agency **consider increasing the speed limit to replicate the scenarios in which these systems will likely be used**.

Blind Spot Intervention[15]

- The expected role of the driver in Level 2 vehicles is much different than in Level 3 vehicles. In Level 2 vehicles, drivers are still expected to remain engaged and the vehicle's technologies are meant to assist the driver in the driving task. Level 3 vehicles, however, will have a software-based, artificial intelligence system that will be designed to handle the driving task completely, under certain scenarios. As a result, the role of the driver will be much different, where simple tasks such as changing lanes will happen dynamically without any intention from a human occupant. Given that Level 3 driving systems require a different role for the driver than Level 1 and Level 2 vehicles, AAA recommends that the agency **consider developing a separate set of test procedures that allow the federal government to assess vehicles that use a Level 3, 4, or 5 automated driving system**. NHTSA should design a separate test that can accommodate a fully-software based system that seeks to provide insight on how human occupants can interact with it safely.

As NHTSA undertakes this important public research, AAA urges the agency to continue refining the parameters of the study to ensure that the results produced from it have the widest impact possible. Before we see widespread adoption of highly automated vehicles, advanced driver assistance technologies will be the building blocks of an automated future. Understanding driver engagement and interaction with these systems will be critical to ensuring that the safety benefits these new technologies offer will actually save lives. AAA looks forward to continuing to work with NHTSA as it develops this study and discussing its important results when released.

---

[13] https://newsroom.aaa.com/2019/10/aaa-warns-pedestrian-detection-systems-dont-work-when-needed-most/
[14] https://www.regulations.gov/document?D=NHTSA-2019-0102-0002
[15] https://www.regulations.gov/document?D=NHTSA-2019-0102-0001

Sincerely,

Jill Ingrassia
Executive Director
AAA Advocacy & Communications