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June 8, 2022

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

RE: Request for Comments: New Car Assessment Program [Docket No. NHTSA–2021–0002]

Dear Administrator Cliff:

AAA appreciates the opportunity to comment on the National Highway Traffic Safety Administration's request for comment to improve vehicle safety information as part of the New Car Assessment Program. With more than 62 million members in North America, AAA is a not-for-profit member services organization committed to supporting a mobility environment built on safe vehicles, drivers and infrastructure systems. Since 2014, AAA has researched and tested advanced driver assistance systems (ADAS): blind spot monitoring¹, lane departure warning/lane keep assistance,² automatic emergency braking,^{3,4} self-parking,⁵ adaptive cruise control,⁶ rear cross-traffic alert systems,⁷ automatic emergency braking with pedestrian detection,⁸ and Level 2 partially-automated systems.^{9,10} AAA's testing has shown that while these partially automated systems can offer safety benefits, system performance varies greatly among automakers and an engaged driver is still a critical safety element. As a leading safety advocate, AAA's research on emerging safety technologies is providing consumers with information and guidance to help navigate this rapidly changing environment.

¹ 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/>

² Ibid.

³ 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/>

⁴ AAA finds automatic emergency braking and lane keeping assistance performance impeded by rain. (2021). Retrieved from: <https://newsroom.aaa.com/2021/10/rained-out-vehicle-safety-systems-struggle-to-see-in-bad-weather/>

⁵ 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/>

⁶ 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/>

⁷ <https://newsroom.aaa.com/wp-content/uploads/2019/06/RCTA-Fact-Sheet1.pdf>

⁸ Automatic Emergency Braking With Pedestrian Detection. (2019). Retrieved from: <https://newsroom.aaa.com/2019/10/aaa-warns-pedestrian-detection-systems-dont-work-when-needed-most/>

⁹ 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/>

¹⁰ AAA Finds Active Driving Assistance Systems Do Less to Assist Drivers and More to Interfere. (2020). Retrieved from: <https://newsroom.aaa.com/2020/08/aaa-finds-active-driving-assistance-systems-do-less-to-assist-drivers-and-more-to-interfere/>

We commend the agency for its efforts to improve the NCAP, and the detailed series of questions included in the notice. In response to the questions outlined, AAA offers the following recommendations for NHTSA's consideration.

ADAS Testing and Performance

Updating Lane Departure Warning/Adding Lane Keeping Assistance

- 1.) *Should the Agency award credit to vehicles equipped with LDW systems that provide a passing alert, regardless of the alert type? Why or why not? Are there any LDW alert modalities, such as visual-only warnings, that the Agency should not consider acceptable when determining whether a vehicle meets NCAP's performance test criteria? If so, why? Should the Agency consider only certain alert modalities (such as haptic warnings) because they are more effective at re-engaging the driver and/or have higher consumer acceptance? If so, which one(s) and why? (pg. 13464)?*

Recommendation: AAA believes that visual alerts for LDW warnings are more susceptible to be overlooked by the driver, and therefore recommend that any visual alert should also be accompanied by haptic alerts.

- 2.) *LKS system designs provide steering and/or braking to address lane departures (e.g., when a driver is distracted). To help re-engage a driver, should the Agency specify that an LDW alert must be provided when the LKS is activated (pg. 13464)?*

Recommendation: AAA recommends that an LDW alert should be provided with corrective action both as an alert mechanism for the driver to pay attention to the driving task and to minimize the possibility that a corrective action could be misinterpreted as a system malfunction.

- 3.) *Euro NCAP's LSS protocol specifies a single line lane to evaluate system performance. However, since certain LKS systems may require two lane lines before they can be enabled, should the Agency use a single line or two lines lane in its test procedure (pg.13464)?*

Recommendation: AAA recommends that two lane lines should be utilized in its test procedure in order to simulate real-world roadways to the greatest extent possible.

- 4.) *Should NHTSA consider adding Euro NCAP's road edge detection test to its NCAP program to begin addressing crashes where lane markings may not be present? If not, why? If so, should the test be added for LDW, LKS, or both technologies (pg.13464)?*

Recommendation: AAA recommends NHTSA add Euro NCAP's road edge detection to its NCAP program for both LDW and LKS technologies, in order to address circumstances that are characterized by no lane markers and a corresponding departure from the paved road surface. In these instances the possibility of injury and/or death is increased.

Adding Pedestrian Automatic Emergency Braking

- 1.) *On page 13474, NHTSA incorrectly cites AAA Pedestrian Detection research stating, "These systems performed better in a scenario that was similar to NHTSA's S1; however, the vehicles avoided a collision with the pedestrian target 40 percent of the time at a 32.2 kph (20 mph) test speed and nearly all the time at a 48.3 kph (30 mph) test speed."*

Correction: AAA research found that at the 30 mph test speed, three out of four test vehicles failed to reduce the impact speed by at least 5 mph during the initial test run¹¹.

- 2.) *NHTSA proposes performing PAEB testing at higher speeds and with various lighting conditions and specifically asks if the proposed test speed range, 10 kph (6.2 mph) to 60 kph (37.3 mph), to be assessed in 10 kph (6.2 mph) increments, most appropriate for PAEB test scenarios S1 and S4 (pg.13474)?*

Recommendation: AAA agrees that higher speeds are more relevant in terms of pedestrian injuries and fatalities; however, AAA also believes that lower speeds are nonetheless relevant in terms of parking lot type scenarios. AAA recommends testing up to 60 kph as it definitively represents a significant upgrade in test methodology relative to earlier procedures.

- 3.) *The Agency has proposed to include Scenarios S1 a-e and S4 a-c in its NCAP assessment. Is it necessary for the Agency to perform all test scenarios and test conditions proposed in this RFC notice to address the safety problem adequately, or could NCAP test only certain scenarios or conditions to minimize test burden but still address an adequate proportion of the safety problem? Why or why not? (pg.13474)?*

Recommendation: AAA believes it is necessary to include the Scenarios S1 a-e and S4 a-c within the NCAP assessment to characterize system response to variations of kinematic characteristics realistically encountered in the naturalistic environment. Additionally, AAA believes Scenarios S1 f and g are of less importance because these scenarios present a reasonable stimulus to system activation; while false positive minimization is important, automakers and suppliers should not be pressured to minimize false positives at the possible expense of reduced system efficacy.

- 4.) *Given that a large portion of pedestrian fatalities and injuries occur under dark lighting conditions, the Agency has proposed to perform testing for the included test conditions (i.e., S1 a-e and S4 a-c) under dark lighting conditions (i.e., nighttime) in addition to daylight test conditions for test speed range 10 kph (6.2 mph) to 60 kph (37.3 mph). NHTSA proposes that a vehicle's lower beams would provide the source of light during the nighttime assessments. However, if the subject vehicle (SV) is equipped with advanced lighting systems such as semiautomatic headlamp beam switching and/or adaptive driving beam head lighting system, they shall be enabled during the nighttime PAEB assessment. Is this testing approach appropriate? Why or why not? Should the Agency conduct PAEB evaluation tests with only the vehicle's lower beams and disable or not use any other advanced lighting systems (pg.13474)?*

Recommendation: AAA recommends that if advanced lighting systems are enabled on the test vehicle during every key on cycle by default during the PAEB evaluation test, they should be utilized during testing in low-light conditions as this represents a standard operating condition.

¹¹ AAA Warns Pedestrian Detection Systems Don't Work When Needed Most. (2019). <https://www.aaa.com/AAA/common/aar/files/Research-Report-Pedestrian-Detection.pdf>.

- 5.) *Should the Agency consider performing PAEB testing under dark conditions with a vehicle's upper beams as a light source (pg.13474)?*

Recommendation: AAA believes high beams should not be utilized during testing pending any available data suggesting high-beam engagement represents a significant use case. Additionally, overhead lights as specified in current Euro NCAP Vulnerable Road User (VRU) test procedure do not challenge PAEB systems to the same extent as low-beam/advanced lighting system use in isolation. As many pedestrian involved collisions occur in areas without overhead lighting, this test condition should not be emphasized over dark test conditions.

- 6.) *To reduce test burden in NCAP, NHTSA proposes to perform one test per test speed until contact occurs, or until the vehicle's relative impact velocity exceeds 50 percent of the initial speed of the subject vehicle for the given test condition. If contact occurs and if the vehicle's relative impact velocity is less than or equal to 50 percent of the initial SV speed for the given combination of test speed and test condition, an additional four test trials will be conducted at the given test speed and test condition, and the SV must meet the passing performance criterion (i.e., no contact) for at least three out of those five test trials in order to be assessed at the next incremental test speed (pg.13475).*

Recommendation: AAA believes this test procedure is an appropriate approach to assess PAEB system performance in NCAP as it reasonably minimizes test burden while testing for a variety of scenarios and subject vehicle (SV) speeds.

- 7.) *Is a performance criterion of "no contact" appropriate for the proposed PAEB test conditions (pg.13475)?*

Recommendation: AAA agrees that performance criterion of "no contact" is appropriate for the proposed PAEB test conditions because "no contact" is an unambiguous representation of successful system performance and should be emphasized in testing methodology.

- 8.) *If the subject vehicle (SV) contacts the pedestrian mannequin during the initial trial for a given test condition and test speed combination, NHTSA proposes to conduct additional test trials only if the relative impact velocity observed during that trial is less than or equal to 50 percent of the initial speed of the SV. For a test speed of 60 kph (37.3 mph), this maximum relative impact velocity is nominally 30 kph (18.6 mph), and for a test speed of 10 kph (6.2 mph), the maximum relative impact velocity is nominally 5 kph (3.1mph). Is this an appropriate limit on the maximum relative impact velocity for the proposed range of test speeds (pg.13475)?*

Recommendation: Yes, AAA believes that reducing the impact speed by half is a reasonable criteria for continued testing at that speed. If impact speed mitigation is not significant, testing experience indicates that better performance for subsequent test runs is unlikely.

- 9.) *Should the Agency adopt the articulated mannequins into the PAEB test procedure as proposed? Why or why not (pg.13475)?*

Recommendation: When evaluating PAEB systems AAA recommends that NHTSA adopt the articulated mannequins into the test procedure because articulation is a basic component

of human gait and certain PAEB algorithms are likely to look for this in determining system response. AAA utilized adult and child articulated mannequins when testing PAEB systems.¹²

- 10.) *Are there other safety areas that NHTSA should consider as part of this or a future upgrade for pedestrian protection (pg.13475)?*

Recommendation: AAA also recommends that NHTSA consider cyclist crash scenarios as a possible candidate for future vulnerable road user based test methodologies.

- 11.) *Considering not only the increasing number of cyclists killed on U.S. roads but also the limitations of current AEB systems in detecting cyclists, the Agency seeks comment on the appropriate timeframe for adding a cyclist component to NCAP and requests from vehicle manufacturers information on any currently available models that have the capability to validate the cyclist target and test procedures used by Euro NCAP to support evaluation for a future NCAP program upgrade (pg.13476).*

Recommendation: AAA recently executed cyclist test scenarios including parallel and perpendicular crossing¹³. For the perpendicular crossing test with a SV speed of 25 mph and a cyclist speed of 10 mph, two out of three test vehicles avoided a collision for all five test runs. This finding implies that current AEB systems are likely capable of reacting to a cyclist to varying degrees and AAA recommends that NHTSA add a cyclist component to the NCAP.

Updating Forward Collision Prevention Technologies

- 1.) *Is it most appropriate to test the middle (or next latest) FCW system setting in lieu of the default setting when performing FCW and AEB (including PAEB) NCAP tests on vehicles that offer multiple FCW timing adjustment settings (pg. 13487)?*

Recommendation: AAA notes that if a system reverts to a specific setting with each key on cycle, this setting should be utilized. If not, the midpoint setting is most appropriate as it should not significantly bias system response relative to endpoint settings.

AEB Strikeable Target

- 1.) *NHTSA also requests comment on the use of the global vehicle target (GVT) in lieu of the Strikeable Surrogate Vehicle (SSV) in future AEB NCAP testing (pg. 13491).*

Recommendation: AAA recommends that the GVT should be used in lieu of the SSV.

ADAS Rating System

- 1.) *With regard to a future ADAS rating system, the Agency seeks comments on whether an overall rating system is necessary and, if so, whether it should replace or simply supplement the existing list approach (pg.13501).*

Recommendation: AAA believes an overall rating system would be a helpful supplement to the existing list approach and would provide consumers additional assistance in determining with a single glance how a particular vehicle rates in terms of both crashworthiness and crash prevention.

¹² Ibid.

¹³ Evaluation of Active Driving Assistance Systems. (2022). Retrieved from: <https://newsroom.aaa.com/2022/05/consumer-skepticism-toward-active-driving-features-justified/>

Revising the Monroney Label

- 1.) *NHTSA plans to issue a notice of proposed rulemaking (NPRM) in 2023 to include ADAS performance information from NCAP in the vehicle safety rating section of the Monroney label, as mandated by the FAST Act (pg. 13501).*

Recommendation: There also must be a concerted effort to establish common terminology or nomenclature to help consumers understand and compare the ADAS systems available in the market. Since each automaker currently uses different naming conventions for their systems, accurate consumer understanding regarding the performance of the system is difficult to achieve. AAA recommends that NHTSA list advanced safety technologies using common nomenclature on the Monroney label in an effort to build consumer understanding and ultimately trust in the systems. In 2019, the AAA Automotive Engineering team researched the prevalence of advanced driver assistance systems (ADAS) naming.¹⁴ This led to a collective effort by AAA, Consumer Reports, J.D. Power, the National Safety Council and SAE to develop standardized naming for advanced driver assistance technology that is simple, specific and based on system functionality.¹⁵ It is believed that, by adopting common terminology across systems, consumers will have a better understanding that this technology is intended to assist and not replace an engaged driver. These terms are not meant to replace automotive manufacturers' proprietary system or package names; rather, they are meant to achieve clearer and consistent information and AAA believes they could be beneficial to consumers if included on the Monroney label.

Establishing a Roadmap for NCAP

- 1.) *NHTSA notes that the Bipartisan Infrastructure Law requires that NHTSA establish a roadmap for the implementation of NCAP not later than one year after the law's enactment (pg. 13502).*

Recommendation: AAA, through its own research, has found that many of these advanced driver assistance systems do not always work as intended. As a result, we recognize the importance of having standards in place that match the level of innovation being designed and deployed on our roads. AAA agrees that NHTSA should establish a roadmap to upgrade the NCAP to include new vehicle safety-related systems and technologies as they mature and data about their use and efficacy become known. In 2021, AAA [supported](#) the Alliance for Automotive Innovation's "Plan to Advance Safety at the Speed of Innovation," which includes long-term and near-term solutions that will bring NCAP into the 21st century and greatly improve the accuracy of the star rating program.¹⁶ AAA recommends that NHTSA consider the Alliance's recommendations as they develop a roadmap to update the NCAP. The advancement of vehicle technology will not slow down anytime soon and it is imperative that safety standards catch up. Federal Motor Vehicle Safety Standards can take many years to modernize, so the proposal to develop a roadmap to update NCAP is the right one in this environment. Consumers rely on and trust this information, so it is critically important for it to be accurate and include testing of all systems.

¹⁴ Advanced Driver Assistance Technology Names: AAA's Recommendations for Common Naming of Advanced Safety Systems. (2019). Retrieved from: <https://newsroom.aaa.com/2019/01/common-naming-for-ad-as-technology/>

¹⁵ Clearing the Confusion: Recommended Common Naming for Advanced Driver Assistance Technologies. (2020). Retrieved from: <https://www.sae.org/binaries/content/assets/cm/content/miscellaneous/ad-as-nomenclature.pdf>

¹⁶ Alliance for Automotive Innovation. Plan to Advance Safety at the Speed of Innovation. (2021). Retrieved from: <https://www.autosinnovate.org/about/advocacy/NCAP%20PDF%204-19-21.pdf>

Adding Emerging Vehicle Technologies for Safe Driving Choices

- 1.) *What are the capabilities of the various available approaches to driver monitoring systems (e.g., steering wheel sensors, eye tracking cameras, etc.) to detect or infer different driver state measurement or estimations (e.g., visual attention, drowsiness, medical incapacity, etc.)? What is the associated confidence or reliability in detecting or inferring such driver states and what supporting data exist (pg. 13504)?*

Recommendation: Indirect driver monitoring systems, i.e. steering wheel sensor based, are significantly less effective at detecting driver distraction or disengagement relative to direct, i.e. camera based, systems. AAA recently conducted research that found evaluated direct monitoring systems issued an inattention alert approximately 50 seconds sooner than evaluated indirect systems for two simulated disengagement modes in both daytime and nighttime lighting conditions.¹⁷ AAA recommends that automakers opt for camera-based driver monitoring systems over steering wheel monitoring; however, more refinement is required to prevent driver distraction and misuse.

- 2.) *What types of consumer acceptance information (e.g., consumer interest or feedback data) are available or are foreseen for implementation of different types of driver monitoring systems and associated mitigation strategies for driver impairment, drowsiness, or visual inattention? Are there privacy concerns? What are the related privacy protection strategies (pg. 13505)?*

Recommendation: AAA believes there are potential privacy concerns related to generated video from camera-based driver monitoring systems. Namely, is the video stored in a manner retrievable to outside entities such as the automaker and/or law enforcement? Can vehicle owners access any video and opt-out of storage and/or transmission, if applicable? AAA believes these privacy concerns must be addressed in order to ensure consumer acceptance of driver monitoring systems.

In closing, AAA appreciates NHTSA’s long standing commitment to improving driver safety and hopes the above recommendations can enhance the shared goal of ensuring the safe and successful expansion of new vehicle technologies to the public with the end goal of reducing crashes, fatalities and injuries on our roadways.

Sincerely,



Greg Brannon
Director
AAA Automotive Engineering

¹⁷ AAA. Effectiveness of Driver Monitoring Systems. (2022). Retrieved from: <https://newsroom.aaa.com/asset/technical-report-effectiveness-of-driver-monitoring-systems/>