



July 27, 2023

Docket No. NHTSA-2023-0021

Docket Management Facility
U.S. Department of Transportation
West Building, Ground Floor
Room W12-140
1200 New Jersey Avenue, S.E.
Washington, D.C. 20590-0001
Filed via www.regulations.gov

**Federal Motor Vehicle Safety Standards:
Automatic Emergency Braking Systems for Light Vehicles
Notice of Proposed Rulemaking
88 Federal Register 38632, June 13, 2023**

Advocates for Highway and Auto Safety (Advocates) files these comments in response to the National Highway Traffic Safety Administration's (NHTSA) Notice of Proposed Rulemaking (NPRM) for automatic emergency braking (AEB) systems for light vehicles.¹ While Advocates supports the proposed rulemaking, NHTSA must expand AEB requirements to cover all vulnerable road users (VRUs) to ensure that everyone is afforded the same minimum level of protection that these essential safety systems provide, among other improvements noted below. The agency also must issue a comprehensive Final Rule expeditiously considering the historically high levels of motor vehicle crash deaths and injuries.

Deaths and Injuries Resulting from Motor Vehicle Crashes are at Historically High Levels

On average, 118 people were killed every day on roads in the U.S. in 2021,² totaling nearly 43,000 fatalities for the year. An additional 2.5 million people were injured.³ This represents a 27% increase in deaths in just a decade.⁴ Early projections for 2022 show traffic fatalities remain high.⁵ Other road users experienced increases in deaths as well. Pedestrian fatalities increased 18 percent, and bicyclist deaths were up 12 percent from 2019 (pre-pandemic) to 2021.⁶ Large truck crashes killed nearly 5,800 people in 2021.⁷ Conservatively, the annual economic cost of motor vehicle crashes is approximately \$340 billion (2019 dollars).⁸ This

¹ 88 FR 38632 (Jun. 13, 2023). [NPRM]

² Overview of Motor Vehicle Traffic Crashes in 2021, NHTSA, Apr. 2023, DOT HS 813 435. (Overview 2021).

³ Overview 2021.

⁴ Traffic Safety Facts 2020: A Compilation of Motor Vehicle Crash Data, NHTSA, Oct. 2022, DOT HS 813 375, (Annual Report 2020); and Overview 2021; [comparing 2012 to 2021].

⁵ Traffic Safety Facts: Crash Stats, Early Estimate of Motor Vehicle Traffic Fatalities in 2022, NHTSA, Apr. 2023, DOT HS 813 428. (Early Estimates 2022).

⁶ Overview 2021, Annual Report 2020.

⁷ Overview 2021.

⁸ The Economic and Societal Impact of Motor Vehicle Crashes, 2019, NHTSA, Dec. 2022, DOT HS 813 403. (Economic and Societal Impact 2019).

means that every person living in the U.S. essentially pays an annual “crash tax” of over \$1,000. Moreover, the total value of societal harm from motor vehicle crashes in 2019 was nearly \$1.4 trillion.⁹

Conservative Estimates Find that Requiring AEB on Light Vehicles Will Save Hundreds of Lives Annually, with the Potential of Actually Saving Thousands

NHTSA has calculated that AEB systems could potentially address over 3,000 fatalities, over 160,000 injuries, and more than 1.1 million property damage only crashes per year.¹⁰ These target population estimates are limited to those situations specifically addressed in the proposed rule (light vehicle to light vehicle or light vehicle to pedestrian crashes) and do not include potential benefits from these systems in other collisions. For example, heavy vehicles, motorcycles, bicycles, multiple-vehicle collisions, or collisions involving some evasive maneuvers were not included in the agency’s estimates. Even with these limitations, NHTSA still calculates that the final rule will save 362 lives each year and prevent over 24,000 injuries.¹¹ In total, NHTSA calculates that the rule will have substantial economic benefits of between \$5.2 and \$6.5 billion annually. In sum, this rule potentially will have a significant lifesaving and cost-saving benefit in reducing motor vehicle crashes, deaths and injuries and economic impacts.

No-Contact Performance Test Requirement

Advocates supports the no-contact performance requirement for the tests as specified in the proposed rule. As NHTSA notes in its research, many vehicles currently are capable of achieving these requirements in the scenarios and at the speeds proposed.¹² Vehicles subject to the proposed rule will be examined under nearly ideal conditions with no adverse weather, lighting (low sun) or other conditions. By requiring a no-contact condition for success, the benefits of the system will be ensured under these ideal type conditions and will be stronger under less-than-ideal conditions in the real world. Specifically, contact at nearly any speed between a vehicle and a vulnerable road user has the potential for serious consequences. Additionally, allowing contact during testing will lessen the strength of the rule and will expose vehicles and test equipment to repeated damage.

Advocates opposes the option of allowing a repeated test process of any manner (after a complete failure, or a failure with contact of any amount of speed). Should NHTSA elect to choose this weak alternative, the agency must provide sufficient information regarding how this alternative compliance requirement correlates with consumer and regulatory confidence that all new vehicles will comply and perform as required. In addition, the agency should indicate how this alternative compares to the confidence level obtained through single trials.

⁹ Economic and Societal Impact 2019.

¹⁰ NPRM at 38643.

¹¹ NPRM at 38709.

¹² NHTSA’s 2022 Light Vehicle Automatic Emergency Braking Research test Summary, NHTSA, Feb. 2023; and 2022 Light Vehicle Pedestrian Automatic Emergency braking Test Summary, NHTSA, Mar. 2023.

False Activation Requirement

Advocates supports retaining the two false activation scenarios in the proposed rule: the steel trench plate and the vehicle pass-through test scenarios. We oppose replacing these scenarios with a documentation requirement alone as it will impact transparency in the compliance process. Rather, we support adding a documentation requirement in addition to the scenarios as well as the agency requiring additional testing.

Advocates supports requiring targeted data recording and storage of AEB activations. This can be achieved by a component of an event data recorder (EDR) or other stand-alone data recording to allow confirmation of compliance across the full range of speeds and defect investigations. For data specifications, the agency should consider triggering requirements which will identify not only performance during appropriate activations but also during false activations. Such an approach may require NHTSA to specify not only a change in speed, but also possibly a level deceleration or jerk as a trigger to capture these events. However, the agency cannot permit this requirement to serve as an alternative to the compliance testing but rather as a necessary addition to the relevant tests to ensure the compliance of AEB systems.

Malfunction Detection Requirement

Advocates supports the requirement for AEB systems to continuously detect an AEB system malfunction and alert the driver. Malfunctions should be recorded as part of the data recording outlined in the previous section. The agency should specify the malfunction telltale as it does with numerous other telltales in the vehicle to ensure that drivers will understand universally that the AEB system is malfunctioning. NHTSA testing of the malfunction detection system and indicator should include both transient (e.g., rain, fog, other fouling) and permanent (e.g., unplugged wires) conditions which would impair the ability of the AEB system to function properly.

Advocates opposes automatic deactivation of AEB systems. If NHTSA is considering creating a list of situations where AEB systems could be automatically deactivated or otherwise restricted, that list should be narrowly tailored and include strong justification and supporting data. The conditions for automatic deactivation should be such that falsely replicating those conditions could not serve as a means for deactivating or disabling the system. Deactivation or disablement should trigger the malfunction telltale and should be recorded as part of the data recording requirement.

System Disablement

Advocates opposes allowing manual AEB disablement. If NHTSA is considering allowing manual AEB disablement, the process must be onerous, requiring multiple steps while the vehicle is not moving, such that drivers must show a deliberate and significant effort to turn off this safety technology. For example, a driver should not be able to disable AEB by simply pressing a single button once. Also, any allowance of disablement must be very limited in scope, and it must be demonstrated that a vehicle cannot have AEB active and accomplish its

transportation purpose simultaneously (i.e., a vehicle with a snowplow attached to its front). In addition, AEB systems must default to “on” at the cycling ignition requiring a driver to repeat the process to disable the system.

System Performance Information

NHTSA must include in the Final Rule a requirement that vehicle manufacturers provide information to vehicle operators about how the AEB system works. Consumers at a minimum should be informed of the operating range, intended function, any warnings, and specific limitations of the AEB system. Overreliance on a system can lead to incidents where consumers expect performance outside of the specifications and dangerous situations can be the result.

Test Procedures

Mannequin Specifications

The agency must determine which pedestrian dummies are best suited to the goal of the regulation. The proposed rule refers to SAE Recommended Practice J3116 and ISO 19206-2:2018, both of which are privately developed documents that the public must pay to gain access to review. NHTSA must make copies of these documents publicly available in the online docket. The agency also requested comment on adoption of ISO 19206-4:2020 specifications for colors / infrared reflectivity / and skin color of the pedestrian targets. Again, these documents are not freely available to the public and should be placed in the docket during the rulemaking process. NHTSA must ensure that all pedestrian dummy specifications are such that the majority of pedestrians can be assured protection through the test being conducted.

NHTSA must demonstrate that the use of the 50th percentile and 6- to 7-year-old pedestrian dummies are sufficient to ensure protection of all pedestrians. If not, the agency must include additional dummies, such as the 5th percentile female, as necessary. In 2021, females constituted 29 percent of pedestrian fatalities.¹³ NHTSA must proceed with all expediency to ensure that the test scenarios and dummies used ensure adequate protection for all pedestrians. The agency has considered specifying the use of the child dummy in all PAEB test scenarios to ensure a range of coverage for pedestrians of various sizes. NHTSA should complete an evaluation of PAEB system performance in response to the child and small female pedestrian dummies to determine if their assumptions are correct and adjust the Final Rule as necessary.

The pedestrian dummy specifications do not include thermal characteristics. Unlike humans who emit heat, the proposed pedestrian dummy does not. Thermal sensors detect heat and, while no company is presently using thermal sensors in their PAEB systems yet, they could be beneficial to improving pedestrian detection. NHTSA must continue research on developing specifications for thermal characteristics and incorporate into the rule as necessary. Such a specification may encourage adoption of thermal sensors in combination with other sensors improving system performance with minimal additional requirements.

¹³ Traffic Safety Facts 2021 Data: Pedestrians, NHTSA, Jun. 2023, DOT HS 813 458.

Vehicle Test Device

NHTSA requests comment on “the option field verification procedure provided in ISO 19206-3:2021.”¹⁴ However, that standard is only available to the public for a fee. Again, the agency must be transparent and provide a copy of any such standards in the docket during the rulemaking process to ensure the public can develop informed responses to requests for comment.

Advocates supports the development and adoption of specifications for the side of the vehicle test device. In the future, AEB functionality may be able to address cross traffic. NHTSA should consider any limitations and concerns with establishing specifications of the rear of the vehicle test device and begin to address these shortcomings for the side of the vehicle.

The agency requested comments on the possibility of allowing a specified list of real vehicles to be used for testing in lieu of a vehicle test device. Advocates does not oppose the development of a list of possible real vehicles that could be used for testing in addition to the specified vehicle test target (the global vehicle target (GVT)). However, NHTSA should consider whether new vehicle sales or existing registrations should be the determining factor for vehicle inclusion in the list. It may be more appropriate for the regulation to consider the most frequently registered vehicles in the U.S. over some lookback period with an established timeline for renewal of the list.

Proposed Effective Date Schedule

The agency should require a more aggressive schedule for compliance given the ubiquity of the inclusion of the components for AEB systems in new vehicles. In addition, Advocates adamantly opposes any further extension of the proposed compliance dates in the NPRM.

Summary of Estimated Effectiveness, Cost, and Benefits

As noted earlier, conservatively the benefits of the proposed rule are estimated to be substantial, saving 362 lives and preventing over 24,000 injuries annually, resulting in a net benefit of \$5.2 to \$6.5 billion annually. Issuing a strong, comprehensive rule with an accelerated timetable for compliance will greatly assist efforts to address the unacceptably high motor vehicle death and injury toll.

Comparison of Regulatory Alternatives

Advocates prefers regulatory option four which would include adding PAEB requirements in turning scenarios in addition to the requirements in the proposed rule. Including the turning scenarios would result in a cost per equivalent life saved of \$3.1 to \$3.9 million, which is still well below the current value of a statistical life (VSL) of \$11.6 million. The rule would still be cost beneficial with annual net benefits of \$4.1 to \$5.4 billion. NHTSA has concluded that

¹⁴ NPRM at 38707.

addressing turning scenarios presented in the proposed rule would generate benefits of 54.3 equivalent lives saved. For these reasons, Advocates recommends NHTSA adopt regulatory option four.

Additional Concerns with the NPRM

Failure to Address Bicyclists and Other VRUs in the Proposed Rule

The New Car Assessment Program in Europe (Euro NCAP) has been testing AEB for cyclists since 2018. Thus, examples for test scenarios and test devices already exist and have been in use for five years for these road users. The Euro NCAP also has recently introduced vehicle to motorcyclists AEB. In 2021, 966 cyclists were killed in the U.S., and another 41,615 were injured.¹⁵ In 2021, 5,932 motorcyclists were killed in the U.S., and another 82,686 were injured.¹⁶ NHTSA must not fail to address this population of VRUs in the proposed rule. In addition, the agency fails to include additional VRUs in the NPRM such as micromobility users, wheelchair users, or those relying on assistive walking devices. It is incumbent that NHTSA ensure protection is afforded to all road users in the proposed rule.

Vehicle-to-Vehicle Scenarios (V2V) Lacking Darkness Testing

The V2V AEB test scenarios proposed do not include dark testing conditions (with lower or upper beams). Yet, NHTSA notes that 43 percent of fatal, 20 percent of injury, and 16 percent of property damage only two-vehicle rear-end crashes of light vehicles occurred in dark conditions.¹⁷ NHTSA must evaluate and present data demonstrating that the exclusion of testing vehicle-to-vehicle AEB under dark conditions is not limiting the performance level demanded by the proposed rule nor needlessly jeopardizing safety.

Lack of Dynamic Brake Support (DBS) Testing in PAEB Scenarios

NHTSA assumes that DBS functionality, and more importantly the design such that a driver manually braking will not override the AEB system, will be required as a function of the V2V AEB testing. Based on this assumption, the proposed rule does not require the testing of DBS functionality in the PAEB test scenarios. NHTSA should either specify that manual braking alone is insufficient to interrupt the AEB functionality or include testing of DBS functionality in the PAEB scenarios.

Lack of 25 Percent Overlap for PAEB Scenarios in Dark Conditions

NHTSA's testing report included in the docket indicates that of the 12 vehicles tested in a crossing path-25 percent overlap-with lower beams, 9 of those vehicles were able to avoid contact at 6.2 miles-per-hours (mph), 12.4 mph, and 18.6 mph. Three models tested were able to

¹⁵ Traffic Safety Facts 2021 Data: Bicyclists and Other Cyclists, NHTSA, Jun. 2023, DOT HS 813 484.

¹⁶ Traffic Safety Facts 2021 Data: Motorcycles, NHTSA, Jun. 2023, DOT HS 813 466.

¹⁷ NPRM at 38640.

avoid a collision at speeds up to 37 mph. As such, NHTSA should include testing requirements at 25 percent overlap as a quarter of currently tested vehicles include such capability.

Conclusion

Advocates commends NHTSA for issuing the NPRM and urges the agency to strengthen and promptly finish and issue this critical rulemaking. Safety on our Nation's roads is at stake and will continue to be needlessly jeopardized with delay and a diminished standard.



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