November 26, 2018

Docket Management Facility, M–30,
U.S. Department of Transportation
West Building, Ground Floor, Rm. W12–140
1200 New Jersey Avenue SE.
Washington, DC 20590.

Re: Response to Docket No. NHTSA-2018-0092; Fed. Reg. Vol. 83, No. 196, October 10, 2018 / Proposed Rules

SAE is a technical standards development organization made up of professional engineers and affiliates interested in advancing the state of the art in automotive and aerospace engineering. SAE International (SAE) has a dynamic Lighting Systems Group numbering 50+ active members. Participation includes members from automakers (lighting and regulatory experts), manufacturers of lighting assemblies and light sources, test equipment and materials, universities involved in lighting research, lighting test facilities, regulatory agencies, and other interested parties.

Within the SAE Lighting Systems Group, the Regulatory Cooperation Task Force facilitates the development and communication of the SAE Lighting Systems Group's consensus position to regulatory agencies. The SAE Lighting Systems Group appreciates this opportunity to provide a response to NHTSA's requests for comments on ADS safety research. In particular, to the third topic and question 5 which seeks comment on "any additional elements of regulatory relief (e.g., exceptions, exemptions, or other potential measures) that might be needed to facilitate the efforts to participate in the pilot program and conduct on-road research and testing involving these vehicles…"

The comments below reiterate the relevant portion of the SAE Lighting System Group's response to Docket No. NHTSA-2018-0009; Fed. Reg. Vol. 83, No. 12, January 18, 2018 / Proposed Rules, which was submitted on March 17, 2018, highlighting the need for regulatory relief to use an alternative light color, not already defined in FMVSS108, for ADS lamps.

Various studies indicate that other road users would be more comfortable with automated driving vehicles if there is some communication between the automated vehicle and the road user. The Center for Design Research, Stanford University indicated that "With increasing capability of self-driving cars…long established practices of communication between drivers and road users outside the vehicle-such as making eye contact, nodding one's head, or giving hand signs-may no longer be possible" and that "pedestrians about to cross in front of a car would like to get a sign that they have been seen." Semcom and CityMobil2 project in Europe (University of Leeds) indicated that "knowing they have been detected by the AV is the most important message to pedestrians and cyclists." Similarly, Chalmers University of Technology AVIP (Autonomous Vehicle's Interaction with Pedestrians) added that "…pedestrians need additional feedback showing a need for an external communication interface…"

The studies above looked at visual lights (as well as visual text and auditory signals) operating in steady and dynamic modes as a method of communication between ADS vehicles and road users. Using currently regulated lamp colors (white, yellow, red) to provide ADS lighting signals presents challenges with potential impairment of required lighting and/or effective communication performance. The SAE Lighting Systems Group and The International Automotive Lighting and Light-Signaling Expert Group (GTB) are both working to develop a standardized lighting solution for ADS-equipped vehicle to road user communication with lamps using an alternative color, e.g. blue-green, not defined in FMVSS 108. The use of an alternative color would differentiate the ADS lamp from existing required lamps and may help facilitate comprehension of the communicated visual light signal. A recent 2018 report by the Institute for

Ophthalmic Research at Tübingen University, Tübingen, Germany recommended "turquoise" / blue-green as the color best suitable for ADS lighting signals.

Further research should be conducted to determine the criteria for robust communication of ADS-equipped vehicles to other road users and from that determine if revisions need to be made to FMVSS 108. Regulatory relief may be required for the use of an alternative lamp color, not currently defined in FMVSS108, to conduct on-road research and testing on ADS-equipped vehicles.

The SAE Lighting Systems Group appreciates the Agency's consideration of these comments. We reiterate our availability to discuss our technical recommendations in greater detail. Please contact Mr. Michael Larsen to arrange such a meeting.

Respectfully submitted on behalf of the SAE Lighting Systems Group.

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cc:
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