IEEE SA STANDARDS ASSOCIATION

March 30, 2021

Deputy Administrator Steven Cliff
National Highway Traffic Safety Administration
1200 New Jersey Avenue, SE
Washington, DC 20590

RE: NHTSA Docket 2020-0106

Dear Deputy Administrator Cliff:

The IEEE Standards Association (IEEE SA) appreciates the opportunity to comment on the National Highway Traffic Safety Administration's (NHTSA) advanced notice of proposed rulemaking (ANPRM) regarding the development of a framework for automated driving system (ADS) safety. IEEE SA commends NHTSA for its leadership in the research and development of ADS technology.

IEEE SA is a globally recognized standards-setting body within IEEE—the world's largest technical professional organization dedicated to advancing technology for the benefit of humanity. Under the purview of the IEEE SA, IEEE develops consensus standards through an open process that engages industry and brings together a broad stakeholder community. IEEE standards set specifications and best practices based on current scientific and technological knowledge. IEEE SA has a portfolio of over 1,500 active standards and over 650 standards under development.

At IEEE, we seek to enhance public understanding of engineering and technology and pursue standards for their practical application. One area of focus for us is ADS technology. ADS technology has the promise to transform personal mobility and provide numerous environmental and societal benefits to the nation's traveling public, including improved roadway safety, reduced traffic congestion and emissions, and broader access to transportation for the disabled and elderly communities, and we are pleased to be developing standards that can assist with realizing these benefits.

As part of our efforts, an AV Decision Making Standards Working Group was formed to help define a safety model for ADS decision making. Safety-related models play an important role in ensuring that an ADS always makes safe driving decisions. Consensus-based standards on AV behavior can help provide transparency in the decision-making logic of the ADS, which is necessary to build public trust in this important safety technology.

IEEE's first project in this area, IEEE P2846, will define "Assumptions for Use in Safety-Related Models," providing a helpful framework for NHTSA to select values for what constitutes reasonably foreseeable assumptions about the behavior of other road users, consistent with the risk-minimizing approach to AV decision making identified by NHTSA. Leading industry stakeholders such as Intel, Nvidia, and Motional have contributed their safety models (Responsibility-Sensitive Safety (RSS), Safety Force Field (SFF) and Rulebooks respectively) to the effort and are collaborating with industry leaders such as Waymo, Aurora, Sellantis, VW, Daimler, UMTRI, NIST, and dozens more.

By clearly defining the boundaries and expectations for safety using a risk-minimizing approach represented by the assumptions used within safety-related models, NHTSA can provide important technology-neutral clarity on expectations of AV behavior, as well as derive metrics to test vehicle performance in a technology neutral manner using the same assumption values.

Another IEEE standard project of possible interest to the NHTSA relative to the development of a framework for ADS safety is IEEE P2851, Standard for Exchange/Interoperability Format for Functional Safety Analysis and Functional Safety Verification of IP, SoC, and Mixed Signal ICs. The development of IPs and SoCs for functional safety critical applications is emerging due to the growth of applications such as automated driving or robotics. Standards such as ISO 26262 (automotive https://www.iso.org/standard/68383.html), IEC 61508 (industrial https://www.iec.ch/functionalsafety/), and many others, are requiring IP vendors and SoC providers to execute functional safety analyses (such as FMEA, FMEDA, FMECA, FTA) and related functional safety verification activities—such as fault injection—and deliver results to system integrators. EDA vendors are also starting to provide tools to automate those activities.

However, at this time, there is not a common language or format to provide those results. In the end, system integrators may be struggling with many different types of data, and as a result spending significant effort to reconsolidate, compare, integrate, and combine the data. With this, the functional safety critical community is seeking solutions to accelerate the functional safety engineering process while reducing risks and costs. IEEE P2851 can help address this challenge by providing an exchangeable exchange/interoperability format for functional safety analysis and functional safety verification activities so as to help facilitate IP vendors and SoC providers in delivering results to functional safety critical system integrators in a consistent way so as to also make possible interoperability between tools provided by EDA vendors.

We welcome the opportunity to provide more details about IEEE P2846 and IEEE P2851, and encourage NHTSA to give consideration to these standards as it develops a safety assurance framework for ADS. We look forward to collaborating with the agency on this significant rulemaking and other ADS-related activities that support the safe deployment of AVs and their numerous benefits in the United States.

Sincerely,

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