



U.S. Department
of Transportation

**National Highway
Traffic Safety
Administration**

1200 New Jersey Avenue, SE
Washington, DC 20590

February 7, 2018

The Honorable Robert L. Sumwalt, III
Chairman
National Transportation Safety Board
490 L'Enfant Plaza East, S.W.
Washington, DC 20594

Dear Chairman Sumwalt:

This letter responds to the safety recommendations issued by the National Transportation Safety Board (NTSB) to the U.S. Department of Transportation's (DOT) Office of the Secretary and the National Highway Traffic Safety Administration (NHTSA) concerning Accident Report NTSB/HAR-17/02 titled *Collision between a Car Operating with Automated Vehicle Control Systems and a Tractor-Semitrailer Truck Near Williston, Florida May 7, 2016*, adopted by the NTSB on September 12, 2017. Our responses to the safety recommendations are discussed below, along with the requested designation.

NTSB Recommendations and Requested Designations:

H-17-37

Define data parameters needed to understand automated vehicle control systems involved in a crash. Parameters must reflect the vehicle's control status and the frequency and duration of control actions to adequately characterize driver and vehicle performance before and during a crash. The Office of the Secretary of Transportation assigned this recommendation to NHTSA to respond.

DOT Action:

On September 15, 2017, NHTSA sent SAE International a letter requesting their assistance in the development of industry standards that define data elements needed for crash reconstruction purposes. An initial meeting was held in November 2017 with the mutual recognition that the Automated Driving Systems' (ADSs) ecosystem would benefit greatly through this effort. Consensus standards developed by SAE International are routinely adopted and widely implemented by vehicle manufacturers and suppliers.

Additionally, NHTSA is in the final stages of preparing a report in response to a requirement in the Fixing America's Surface Transportation Act to examine "the amount of time event data recorders [EDRs] installed in passenger motor vehicles should capture and record for retrieval vehicle-related data in conjunction with an event in order to provide sufficient information to investigate the cause of motor vehicle crashes." NHTSA sent a copy of the final technical report to SAE International to be used as input for their work on crash data elements for ADSs.

Manufacturers are not currently required to enable vehicles to record data from usage of driving automation systems (SAE Levels L1-L5) or operation of such systems during crash-triggered events. The ability for traditional vehicle manufacturers and other stakeholders to report on automated technology system use and its operation during incidents and crashes is highly dependent on each vehicle's specific recording and downloading technology. In certain instances, some customer use information may be available to stakeholders via over-the-air (OTA) telemetric systems that may be installed in the vehicle. In other instances, there may be no such means to obtain information regarding operation of the vehicle.

DOT's newly released *Automated Driving Systems 2.0: A Vision for Safety*, Section 1: Voluntary Guidance for ADS Safety Elements, describes recommended best practices for data recording. In that section, NHTSA encourages entities engaging in ADS testing or deployment to collect crash-related vehicle data and have the capability to share that data with government authorities for crash reconstruction purposes. It is anticipated that many of these systems will be installed with OTA capability. Consistent with the Department's approach to oversight of ADS technology, NHTSA believes this is best accomplished through voluntary compliance until industry consensus on standard data elements can be established. The guidance may be applied in part to any level of automation.

Based on the information provided, DOT respectfully requests that NTSB classify Safety Recommendation H-17-37 as "Open-Acceptable Response."

H-17-38

Develop a method to verify manufacturers of vehicles equipped with Level 2 vehicle automation systems incorporate system safeguards limiting the use of automated vehicle control systems to those conditions for which they were designed.

NHTSA Action:

All entities developing automated vehicle technologies are encouraged to adopt voluntary guidance, best practices, design principles, and standards developed by established and accredited organizations such as the International Standards Organization, SAE International, and other applicable standards or internal company processes. While guidance within *Automated Driving Systems 2.0: A Vision for Safety* is voluntary, sections pertaining to system safety, operational design domain, human machine interface, validation, and consumer education and training may benefit entities developing ADS.

Automated Driving Systems 2.0: A Vision for Safety, specifically focuses on SAE Levels L3-L5, for which there is either no human driver or for which the human driver can control the ADS, but in certain instances would not be expected to perform any driving-related tasks for a period of time. However, as previously mentioned, parts of the voluntary guidance could be applied to any level of automation. This includes Level 2 – Partial Driving Automation systems, defined by SAE International J3016: Taxonomy and Definitions for Terms Related to On-Road Motor Vehicle ADS, as the driver performing part or all of the dynamic driving task.

NHTSA has no current plans to develop a specific method to verify manufacturers of vehicles equipped with Level 2 systems incorporate safeguards limiting the use of automated vehicle control systems to those conditions for which they were designed. Instead, if

NHTSA identifies a safety-related defect trend in the design or performance of a system, or identifies through its research or otherwise, any incidents in which a system did not perform as designed (including Levels L0 through L5), it would exercise its authority as appropriate.

NHTSA continues to be engaged in the development and deployment of lower level systems and is conducting research with these systems in both controlled test track and naturalistic settings. Functions such as traffic jam assist, automated parking, and automated highway driving are being tested to characterize performance and understand the potential safety benefits of the technology. As research is concluded, the agency will make findings available on our website: www.nhtsa.gov.

Collaboratively, NHTSA and all industry stakeholders must work together to ensure we properly educate the motoring public on different levels of driving automation. It is important that drivers understand system functions, capabilities, and limitations to avoid safety risks resulting from abuse or misuse.

Based on the information provided, NHTSA plans no further action specific to the recommended action and respectfully requests that NTSB classify Safety Recommendation H-17-38 as “Closed-Acceptable Response.”

H-17-39

Use the data parameters defined by DOT in response to Safety Recommendation H-17-37 as a benchmark for new vehicles equipped with automated vehicle control systems so they capture data reflecting the vehicle’s control status and the frequency and duration of control actions needed to adequately characterize driver and vehicle performance before and during a crash; captured data should be readily available to, at a minimum, National Transportation Safety Board investigators and National Highway Traffic Safety Administration regulators.

NHTSA Action:

As previously discussed in response to Safety Recommendation H-17-37, NHTSA will continue working with SAE International to define data parameters needed to understand automated vehicle control systems involved in a crash. Until a benchmark based on these parameters can be considered, *Automated Driving System 2.0: A Vision for Safety* put forth interim crash reconstruction recommendations to entities engaged in ADS testing or deployment (see Section 1, Part 10. Data Recording). NHTSA’s guidance recommends data capture on vehicle control leading up to, and during, a crash, and technical and legal capabilities for sharing relevant recorded information with government authorities. NHTSA has directed manufacturers and other entities to participate in the agency’s Early Warning Reporting program to assist in identifying safety issues associated with ADSs.

Given these actions and needed developments, NHTSA requests that Safety Recommendation H-17-39 be classified as “Open – Acceptable Response.”

H-17-40

Define a standard format for reporting automated vehicle control systems data and require manufacturers of vehicles equipped with automated vehicle control systems to report incidents, crashes, and vehicle miles operated with such systems enabled.

NHTSA Action:

As indicated in our response to Recommendation H-17-37, the research to define data parameters of EDRs specific to automated technologies is being planned. Associated with that planning, NHTSA will investigate the need for a standard format for reporting such data. Based on this plan, NHTSA respectfully requests NTSB classify Safety Recommendation H-17-40 as "Open-Acceptable Response."

H-13-30

Develop minimum performance standards for connected vehicle technology for all highway vehicles.

H-13-31

Once minimum performance standards for connected vehicle technology are developed, require this technology to be installed on all newly manufactured highway vehicles.

NHTSA Action:

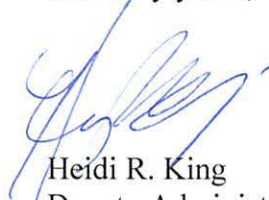
On January 12, 2017, NHTSA published a Notice of Proposed Rulemaking in the Federal Register proposing to establish a new Federal Motor Vehicle Safety Standard No. 150, "vehicle-to-vehicle (V2V) communications" to mandate V2V communications for new light vehicles and to standardize the message and format of V2V transmissions. Connected vehicle technologies are intended to provide an information environment in which vehicle and device manufacturers can create and implement applications to improve safety and mobility. NHTSA has not yet made any final decision on the proposed rulemaking concerning a V2V mandate.

As the agency is deliberating its next steps with respect to the light vehicle V2V rulemaking, we note technology needs for heavy vehicles are far more complicated than those required for passenger cars and light trucks. As we conduct research into many of these complicating factors, including issues with tractor-trailer communications, transit buses, retrofit of existing vehicles, human factors, safety pilot programs, and potential safety benefits, we are in the process of launching several new research programs seeking to build upon our existing body of knowledge.

At this time, we request NTSB classify Safety Recommendations H-13-30 and H-13-31 as "Open – Acceptable Action."

If you have any questions, or require additional information, please contact me or Mr. Brian Barnard, Director, Governmental Affairs, Policy and Strategic Planning, at 202-366-2386.

Sincerely yours,



Heidi R. King
Deputy Administrator