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Mr. James Owens
Deputy Administrator
National Highway Traffic Safety Administration
1200 New Jersey Avenue, SE
Washington, DC 20590

Notice of Proposed Rulemaking: Occupant Protection for Automated Driving Systems; Docket No. NHTSA 2020-0014

Dear Deputy Administrator Owens:

The Insurance Institute for Highway Safety and Highway Loss Data Institute (IIHS-HLDI) welcome the opportunity to comment on the National Highway Traffic Safety Administration's (NHTSA's) proposed changes to the 200 series of the Federal Motor Vehicle Safety Standards (FMVSS) to address the issues created by the advent of automated driving technology.

We recognize that nearly all FMVSS were conceived without considering the possibility that vehicles may not need nor have human drivers. The modifications proposed by NHTSA likely will be helpful to the entities developing automated driving systems (ADS) and the vehicles that will be controlled by ADS, as the changes answer some questions about how the occupants of ADS-controlled vehicles should be protected in the event of a crash.

We are concerned, however, that the current Notice of Proposed Rulemaking (NPRM) creates a path for deploying into the market ADS-controlled vehicles without regulations that establish the ground rules for the safe behavior of ADS. Automated driving technology may be a promising tool to address some of the motor vehicle crashes (MVCs) that are caused by human error. However, it is not appropriate to assume that automating driving will eliminate or even significantly reduce MVCs attributable to human error. After all, ADS will be developed by humans who are prone to the errors that lead to MVCs. Without appropriate and enforceable guidance, there is nothing to prevent ADS from being designed with the same misunderstanding of safe driving that leads human drivers to err in ways that lead to crashes.

The promise that technology can make driving safer is based on studies establishing the efficacy of advanced driver assistance systems (ADAS), some of which automate emergency braking in response to imminent crash situations (Cicchino, 2017, 2018a, 2018b; HLDI, 2018). These studies also show that even ADAS that don't automate control help drivers avoid crashing. The extent of automation needed to prevent crashes attributed to human error remains unknown, and recent fatal crashes involving Tesla's Autopilot suite of ADAS features raise questions about whether more automation is safer and also illustrate the limitations of current technology to recognize and avoid hazardous situations (National Transportation Safety Board [NTSB], 2017a, 2019, 2020a, 2020b). Technology's ability to help humans drive safer is well established, but there remains no proof that replacing humans with ADS will be safer and so far, NHTSA has not provided enforceable guidance to achieve this outcome.

IIHS-HLDI understand that in issuing the current NPRM, NHTSA has limited the scope of its proposed changes to providing clarity about the interpretation of occupant protection FMVSS in the context of vehicles with ADS, while maintaining the safety level embodied in those regulations. This strategy, however, misses opportunities to begin establishing the expectations for the behavior of ADS. For

example, we previously suggested that NHTSA require ADS respond to conditions that would light telltale alerts by taking the action expected of the ideal human driver—delaying the start of a trip if an airbag is in a malfunction state or any passenger is not properly restrained (IIHS-HLDI, 2018, 2019). Moreover, this strategy leaves safety gaps in existing FMVSS like exempting certain vehicle classes from some requirements.

NHTSA should be extending the same level of crash protection established for the front row to occupants of rear seating areas in vehicles with ADS. There is no reason to suppose that occupants will continue to show a preference for front-row seating over rear rows in vehicles entirely controlled by ADS. NHTSA's limited approach in addressing occupant protection for vehicles with ADS nearly guarantees that some occupants of the first automated vehicles operating in commerce will be less well protected in a crash than they are currently. Our research shows that occupants sitting behind the front row are no longer safer than their counterparts in front and that some age cohorts are less well protected in back (Durbin et al., 2015). This deficiency in occupant protection ought to be addressed as part of NHTSA's strategy to enable automated driving technologies.

These concerns notwithstanding, IIHS-HLDI generally support NHTSA's approach to modifying the 200 series regulations to address the ambiguity that will result from trying to assess compliance with them in the context of vehicles controlled by ADS. IIHS-HLDI agree that vehicles without traditional controls need not comply with regulations ensuring that the controls do not impose an injury risk to drivers. Likewise, we find it sensible that absent controls, the left front seat should be subject to the same requirements currently applied to the right front-passenger seat. The additional definitions and word substitutions proposed for FMVSS 201, 205, 206, 207, 208, 214, 216a, and 226 accomplish the agency's aim in this regard.

We offer for your consideration the following suggestions pertaining to certain aspects of NHTSA's proposal.

Dual-use vehicles: NHTSA's proposal is clear that the front left outboard position in vehicles without manual controls would be subjected to the same occupant protection requirements as currently are imposed on the right front seat. That same seat would be required to comply with current driver seat requirements in vehicles where manual controls are present. The NPRM further states, "If dual-mode vehicles have the capability of stowing driving controls, *NHTSA expects* [emphasis added] that manufacturers will need to certify compliance in both states (e.g. manually-operated driving controls available and stowed)" (p. 17634). It is not clear whether NHTSA's expectation is supported by its proposed changes to the regulatory text or based on some unpublished interpretation of the modified regulation. IIHS-HLDI urge NHTSA to modify the regulatory text to ensure its expectation is met.

Airbag readiness indicator (i.e. telltales): NHTSA's proposed changes to both FMVSS 226 S4.2.2 and FMVSS 208 S19.2.2(d) would require that these telltales be "…clearly visible from *any* [emphasis added] designated seating position if no driver's seating position is occupied or present" (p. 17657). We consider *any* to be ambiguous, allowing automakers to choose from which seat the telltale is visible. This would be insufficient to ensure that any passenger in a vehicle entirely controlled by an ADS, no matter their seating position, will receive important notice on the airbag's operating condition. We suggest requiring that such telltales be visible from *all* designated seating positions to be sure that any occupant is informed about an airbag's lack of readiness.

NHTSA requested comment on whether such telltales should provide readiness information unique to each applicable designated seating position. IIHS-HLDI agree that information about

airbag readiness should also inform passengers as to which seating positions are affected by an airbag's readiness or lack thereof.

Finally, we reiterate our suggestion that in vehicles solely controlled by ADS, the lack of airbag readiness due to self-diagnosed malfunction should prevent the initiation of a trip if the affected seating position is occupied. Human drivers may err by ignoring the lack of airbag readiness, but ADS should be designed to ensure their passengers' crash protection.

Bench seats and center seating positions: NHTSA's proposal to clarify the dummy positioning on bench seats under FMVSS 214 by using the seating reference point of the designated seating position where the dummy is located seems sensible. However, we recognize that doing so could result in dummy positioning not representative of where people similar in size to the dummy would choose to sit. We suggest that NHTSA ensure that this change will not result in unrealistic dummy positioning for all relevant dummy sizes before making its proposed change.

As noted above, NHTSA should be extending the same level of crash protection established for the front outboard seating positions to all designated seating positions in a vehicle controlled solely by an ADS. As such, front-row center positions should be required to have Type 2 belts and airbag protection, whether or not the front row also includes outboard designated positions. NHTSA could achieve this by requiring that front center positions comply with the current requirements for the front right outboard position.

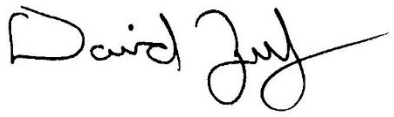
Child occupant protection: We support NHTSA's suggestion that in ADS-controlled vehicles having manual driver controls to support dual-mode use, the ADS should be required to prevent motion if sensors in the driver's designated seating position detect the presence of a child occupant. The current airbag requirements for the driver seat do not require that the airbag be suppressed or inflate with low-injury risk in the presence of a child occupant. Furthermore, FMVSS 203 and 204 are not based on consideration of injury risk for children exposed to the steering system. As such, we think it prudent to prevent the possibility of a child occupant being exposed to crash injury while seated in a driver seat.

School buses: The deficiency of NHTSA's approach to modifying occupant protection standards is especially evident in its proposal to amend FMVSS 208 regarding seat belts in school buses. Currently, only the driver's designated seating position is required to be equipped with Type 2 belts or have occupant protection demonstrated by crash test. The NPRM proposes that in school buses solely controlled by ADS, either the left front designated seating position or all front-row seating positions be subject to this requirement and requests comments on the preferable option. Either of NHTSA's proposals would create a disparity of protection for the student passengers depending on where they sit in the bus.

The NTSB (1999) has previously recommended better crashworthiness regulations for school buses and ultimately closed that recommendation 10 years later noting "Unacceptable Action" by NHTSA. Recent investigations by the NTSB have documented the efficacy of lap/shoulder belts at preventing injury (NTSB, 2016, 2017b). As such, we recommend that NHTSA require better crashworthiness protection, including Type 2 belts, for all seating positions in school buses solely controlled by ADS. NHTSA (2011) has estimated that the cost of fitting belts in all seats is an additional $10,300 above the cost of a bus without them, or about a 14% increase. This incremental cost will be a miniscule proportion of the total cost to create a school bus that is controlled by an ADS, rendering moot any argument based on the cost of providing this protection.

In summary, IIHS-HLDI generally agree with NHTSA's approach to clarifying the 200 series of FMVSS for vehicles equipped with ADS. We remain concerned, however, that removing these hurdles to the implementation of automated driving technology before establishing appropriate and enforceable requirements for ADS' safe driving behavior amounts to putting the cart before the horse.

Sincerely,



David Zuby
Executive Vice President &
Chief Research Officer

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