



Insurance Institute for  
Highway Safety



**Statement before the National Highway Traffic  
Safety Administration, U.S. Department of  
Transportation**

**Revising the Federal Motor Vehicle Safety  
Standards to Address the Issues Related to  
Automated Driving Technology**

**March 6, 2018**

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## **Introduction**

My name is David Zuby and I represent the Insurance Institute for Highway Safety (IIHS) and Highway Loss Data Institute (HLDI). Both organizations are dedicated to identifying ways to reduce the deaths, injuries, and property damage that result from motor vehicle crashes. Our work is wholly supported by voluntary contributions from companies that sell automobile insurance in the United States and Canada.

Thank you for the opportunity to comment on the National Highway Traffic Safety Administration's (NHTSA) effort to revise the Federal Motor Vehicle Safety Standards (FMVSS) to address the issues created by the advent of automated driving technology. Now is the time to consider how FMVSS need to change, not only to enable the further development of automated driving technology but also to ensure that vehicles equipped with it are as safe as possible. IIHS-HLDI agrees with the conclusions of Volpe Center's review of FMVSS for automated driving. Specifically, that the FMVSS do not appear to present significant hurdles to the near-term implementation of automated driving, even if some aspects of some regulations need to be modified to clarify how compliance with them can be adequately demonstrated in the context of vehicles with automated driving systems. And that, automated vehicles with novel designs like non-traditional seating positions, may require further modification of existing FMVSS.

Importantly, we find that the concepts upon which the FMVSS are based are as important in the context of automated vehicles as in the context of human-driven ones. Automated vehicles need adequate conspicuity, effective speed control, stability, and steering to operate safely. Plus, the critical status of these systems needs to be communicated to the driver regardless of whether it is a human or computer. Occupants deserve to be protected from unnecessary injury risks in the event of a crash and the postcrash disposition of a vehicle needs to ensure not only the safety of its occupants, but also of those who offer help at the crash scene. Rather than merely removing regulatory hurdles, IIHS-HLDI recommend that NHTSA consider how automated driving technology can be used to improve upon the current state of vehicle safety, and even contemplate new regulations to compel this improvement.

## **Vehicle control between humans and automated driving systems**

NHTSA's request for comments poses numerous questions about vehicles without traditional human operated controls like a steering wheel and pedals. However, it also is possible that fully automated driving systems will be introduced in vehicles that optionally can be human driven. In such vehicles, the requirements for controls, visibility, and displays remain essentially unchanged from current needs and may even require additional regulation to ensure that the exchanging of vehicle control between humans and automated driving systems is unequivocally clear to both. The current variation in how driver assistance systems communicate with human drivers suggests a possible need for regulatory guidance to minimize potential driver confusion. In cars that cannot be driven by humans, the status of critical systems (e.g. airbags, brakes, tire pressures) may not need to be communicated to a human if automated vehicles are programmed not to embark on a trip in an unroadworthy state. This could be an improvement over the

current situation that relies upon humans to take appropriate action in response to a telltale indicating a deficiency with a safety critical system. Rather than eliminating requirements for telltales in automated vehicles, NHTSA should consider replacing them with regulations requiring that automated vehicles take themselves out of service when the status of critical systems cannot support a safe trip.

### **Novel seating positions in fully autonomous vehicles need additional research**

Several occupant protection regulations either explicitly or implicitly refer to the presence of a human driver. While this may seem an impediment to deploying automated vehicles, the same regulations typically also require protection for passengers. IIHS-HLDI suggest that current passenger test procedures and performance requirements could be adapted to cover all occupant seating positions in vehicles designed never to be human driven. However, before allowing vehicles to be designed to accommodate rear-facing, side-facing, or supine occupants, for example, research is needed to determine whether occupants in such seating configurations can be adequately protected in crashes. If adequate protection is achievable, then new tools are needed to evaluate crash protection in these novel seating positions. Today's crash test dummies can't lie down, and those designed to evaluate rear crash protection are not robust enough to evaluate protection for rear-facing occupants in front crashes. We expect that regulatory changes to accommodate radical changes in vehicle design will, and should, take time. In any case, IIHS-HLDI urge NHTSA not to consider diluting occupant crash protection on the promise of unproven crash reductions.

### **The need for a public database of vehicles with automated driving systems**

This brings me to the need for information to monitor the effects on road safety of automated driving systems as they are introduced into the fleet. Early evaluation of the safety benefits of automated driving systems is key to building public confidence in the technology, and can also help identify problems before deficient implementations become too widely spread through the vehicle fleet. We observe that automated driving technology is entering the vehicle fleet as optional features available to consumers at extra cost. This creates an opportunity to measure the effects on safety of the new technology by comparing crash experience of the vehicles with the options to those without, while controlling for other vehicle characteristics that may affect crash risk and severity. In fact, these types of analyses are the basis for our knowledge about the benefits of electronic stability control (ESC) and automatic emergency braking (AEB) along with many other safety innovations. To conduct such analyses, we need to know which specific vehicles on the road are equipped with the options and which are not. This information is not encoded in the vehicle identification number; but automakers know when they build each vehicle which optional content is onboard. So, it would be possible to construct a database to keep track of which specific vehicles are equipped with which specific types of technology and combine this with insurance claim data or police crash reports that also have the VIN to conduct evaluations of how the technologies affect safety. IIHS-HLDI recommend that NHTSA consider creating a publicly accessible database with

information identifying the presence of optional driving automation features associated with a specific VIN to facilitate the evaluation of automated driving systems.

### **Additional data elements to help understand the role of automation in crashes**

Finally, we ask NHTSA to consider revising Part 563 to add data elements to help understand the role of automation in crashes of vehicles with automated driving systems. The Institute has developed a list of data elements we believe can be collected using an event data recorder and are sufficient for understanding the circumstances of a crash and the contribution of driving automation technology without compromising confidential business information. This type of information will help determine whether the human or vehicle was in control at the time of a crash and the actions each entity took prior to it. Insurers need this information to assign liability and settle claims. It also can help researchers illuminate the challenges humans face as the driving task becomes increasingly automated.

### **Conclusion**

While it's important to consider how current regulation may stand in the way of innovation that promises to make road transportation safer, it's also important to consider how regulation can be used to guide innovation to its promised end. Thank you for your time.