

November 22, 2016

Docket Management Facility U.S. Department of Transportation 1200 New Jersey Avenue, SE Room W12-140 Washington, DC 20590

Re: Docket Number NHTSA-2016-0090

Dear Docket Officer:

We appreciate the leadership of the National Highway Traffic Safety Administration (NHTSA) to chart a course for the future of vehicle automation, and the agency's emphasis on safety. Thank you for allowing the National Safety Council (NSC) the opportunity to comment on the proposed Federal Automated Vehicles Policy (AV policy).

NSC believes advanced vehicle technology, up to and including fully automated vehicles, can address mobility issues and provide many benefits to society. However, the most important benefit of automation is the potential to significantly curtail the epidemic of crashes, injuries, and fatalities on our roadways. Recognizing safety as the number one priority, we are particularly supportive of your policy framework efforts to address challenges and seek input as this technology develops and matures.

The National Safety Council is a 100-year-old nonprofit committed to eliminating preventable deaths in our lifetime by focusing on injuries in workplaces, on the road, and in homes and communities. Our more than 13,500 member companies represent employees at more than 50,000 U.S. worksites. We also educate more than 1 million drivers each year in defensive driving techniques through our programs.

Today, unintentional injuries are the fourth leading cause of death in the United States.<sup>1</sup> Motor vehicle crashes are the leading cause of unintentional death for people from 3 to 25 years of age and a leading killer in all age groups.<sup>2</sup> Driver behavior is the biggest single contributor to motor vehicle crashes, and has proven to be the hardest problem to solve. If we are to eliminate preventable deaths in our lifetime, we must realize massive, near-term gains in highway safety. The National Safety Council believes that as more crash prevention safety systems are introduced into the fleet, more lives will be saved.

### **NSC Support for Policy**

NSC applauds both NHTSA and the Department of Transportation (DOT) for your efforts to promote benefits of safe and appropriate use of increasing levels of driving automation, while at the same time, encouraging innovation and continuous improvement among automakers and suppliers. We support research and development to achieve the fully automated vehicle, and the infrastructure needed to support such a mobility option.

Initial development and deployment of Advanced Driver Assistance Systems (ADAS) through the U.S. fleet provides the driving public a real world opportunity to experience first-hand how technology can provide an added margin of safety on the road. However, the manner in which

<sup>&</sup>lt;sup>1</sup> National Safety Council, *Injury Facts*, 2016

<sup>&</sup>lt;sup>2</sup> National Safety Council, Injury Facts, 2016



drivers are introduced to these systems affects the rate of acceptance and adoption. Media and other interested parties may portray today's technology in a way that is confusing to the public with regard to the capabilities of particular systems. For the near term, drivers will need to remain in control of their vehicles for more practical reasons.

# **Education and Training**

A robust education program is necessary, and NSC applauds its inclusion in the proposed policy. NSC created the nation's premier research-based vehicle automation education program – <u>MyCarDoesWhat</u>. NSC agrees with DOT that there is a driver understanding gap as new technologies are deployed, and older technologies are updated or retired. It is our belief that education and training are required to speed adoption and proper use of these features. It is also our belief that education will need to continue through the life of the vehicle, as software and hardware updates in turn modify the operational parameters for vehicle systems.

The need for education and training arises from a lack of knowledge or confusion because:

- Drivers did not learn to drive on vehicles equipped with ADAS features (Automation Levels 1, 2 or 3), and thus have no background in how to interface with or properly operate them.
- ADAS safety features have different brand names that vary among manufacturers.
- These names may contain phrases that give the impression that systems have more capabilities than they truly do, potentially resulting in driver over-reliance. NHTSA should consider actions proposed by the state of California:

[Prohibit] the advertisement of lower levels of automated systems, where the human driver is still responsible for monitoring or control of the vehicle, as "autonomous", "self-driving" or other similar terms.<sup>3</sup>

- The underlying (generic) safety feature names frequently vary.
  - NHTSA should consider standardizing nomenclature and/or taxonomy. For instance, depending on the manufacturers, Automatic Emergency Braking is also referred to as forward collision mitigation, front crash protection, or autobraking, among others.
- Warning or icon standardization issues persist resulting in confusion for the driver.
  - o Additionally, not all systems clearly indicate if safety features have been disabled.
- Safety features have different operational parameters and limitations across manufacturers, and potentially even within the same manufacturer's varying models or trim levels.
  - Further, these may change over time as software is updated, for example and drivers need to be properly educated on how these changes affect the operation of their vehicle.
- Safety feature operational parameters and limitations may not be intuitive or obvious, particularly if drivers use different vehicles. This may be exacerbated if a vehicle's

<sup>&</sup>lt;sup>3</sup> <u>https://www.dmv.ca.gov/portal/wcm/connect/211897ae-c58a-4f28-a2b7-03cbe213e51d/avexpressterms\_93016.pdf?MOD=AJPERES</u>



Operational Design Domain<sup>4</sup> or Object Detection and Response Characteristics<sup>5</sup> are not explicitly and succinctly communicated to the driver, so they can be aware of limitations, shortcomings or differences in systems.

Just as the National Safety Council educated the driving public about the benefits of seatbelts and airbags 20 years ago, NSC stands ready to work with NHTSA, as well as the auto manufacturers, suppliers and technology developers, auto dealers, regulators, state government officials, law enforcement, first responders, driver training educators, and highway safety advocates to develop education and training materials and platforms that will address the requirements of this policy, as well as the potential confusion points noted above.

Further, since we believe these safety features hold great promise to reduce crashes and save lives, NSC believes meaningful education and training will accelerate acceptance and adoption of safety related automation and ADAS technologies in vehicles as they continue to evolve along the path to the fully automated vehicle.

### **Data Recording and Sharing and Privacy**

The National Safety Council is very bullish on ADAS, and eventually fully automated vehicles, because we know when implemented safely and properly, they will help us realize huge gains in reducing roadway fatalities. If we are to realize the life-saving benefits, at minimum we must ensure that we have reliable event data recorders that produce downloadable data in a standardized format for investigators, law enforcement, state highway safety offices, insurers and other relevant stakeholders. Following a crash, we must be able to answer simple questions like whether the vehicle systems or the human driver had control of the car, if and how the vehicle was communicating with the driver, and if all systems were working as designed.

The AV policy details the importance of data collection as these technologies begin to be tested in real-world scenarios. Understanding the circumstances and causes surrounding malfunctions, including at lower levels of automation, will help make this technology stronger and safer, and ensure failures are less likely to occur as technology evolves. This will be especially important in assuring consumers of the reliability of ADAS and automated technology. As the former Chairman of the NTSB, I believe that minimum parameters should be set for data preservation, standardization of formats, ease of access for post-crash evaluation, and establishment of privacy protections early in the process. Data-sharing programs require greater maturity and a strong safety culture committed to continuous improvement.

Event data recorders (EDRs) are widely used throughout the automotive industry in vehicles of all shapes and sizes, yielding valuable data in crash reconstruction efforts. Similar devices are used in other modes of transportation as well. Amtrak utilizes event data recorders that automatically transmit data from locomotive recorders to a control center when an incident occurs. In the aviation industry, crash-hardened "black box" data recorders store thousands of parameters of data. Much of this information is collected after normal flights and analyzed by the operator to learn about and improve operations, and in the case of an incident, the data is invaluable to investigators to determine what occurred. The same could be true for motor vehicles.

 <sup>&</sup>lt;sup>4</sup> A description of the specific operating domain in which an automated function/system is designed to properly operate (i.e. roadway types, speed range, environmental conditions, etc.)
<sup>5</sup> The ability to detect objects and respond accordingly



Missing from the policy, however, is clarification on whether lower-level systems (below Level 3) should be subject to the same data collection guidelines. The current event data recorder standards do not require the majority of Levels 1 and 2 safety systems' sensors be tracked.<sup>6</sup> This lack of information limits real world data availability that could guide the future development of these technologies to make them safer. Currently, there is no easy way for manufacturers, law enforcement, investigators or vehicle owners to understand whether deployed systems were active during a crash, whether they malfunctioned, or whether they helped mitigate damage or injury or returned the car to a safe state in event of a malfunction.

Information sharing is included in the AV policy. However, the policy fails to mention the public health argument for collecting data from electronic devices in the car in the event of a crash. Acquiring an understanding of what happens when systems perform as intended, fail as expected, or fail in unexpected ways will yield valuable information for manufacturers—some of whom have common suppliers. Further, in-service data, as well as near miss and post-crash information sharing, can help civil engineers and planners design better and safer roadways, as well as help safety and health professionals design better interventions to discourage risky driving or affect the behaviors of other roadway users.

De-identified data sharing has been in existence in the aviation industry for many years and proven highly successful. The Aviation Safety Information Analysis and Sharing (ASIAS) system allows for sharing of de-identified data across the aviation industry, making it possible for the industry to identify trends and act on them. Analysis of de-identified data will provide windows into leading indicators in the motor vehicle industry. Leading indicators are "proactive, preventative and predictive measures that monitor and provide current information about the effective performance, activities and processes of a ... system that drive the identification and eliminate or control of risks."<sup>7</sup> The NSC Campbell Institute, a leader in workplace safety, health and sustainability, states that tracking leading indicators allows world-class safety organizations to make further improvements to their safety records.<sup>8</sup>

The AV policy also suggests that auto manufacturers use EDRs to gain a better understanding of how human operators engage with advanced technology. This knowledge will allow manufacturers to be nimbler and make adjustments in near real-time for some systems, based on what is actually occurring in the driver's seat, rather than making changes based on assumptions and estimations that must be accommodated in a later model year. Collecting and sharing de-identified data about near misses and other relevant problems could also help by aggregating useful information for the automotive industry, allowing them to take proactive steps based on leading indicators rather than waiting for a crash or a series of crashes to occur. Finally, this data would be useful to researchers and the safety community in analyzing the safety benefits–and potential drawbacks–of these technologies as they continue to mature.

While there are competing priorities regarding protecting personal privacy and proprietary systems or designs, NSC believes that safety should be the ultimate priority, and that other concerns need to be accommodated to prioritize safety. NHTSA should facilitate data sharing as widely as possible and require that manufacturers provide accessible, standardized data to law enforcement, state highway safety offices, investigators, insurers, and/or other relevant stakeholders.

<sup>&</sup>lt;sup>6</sup> <u>49 CFR 563</u>

http://www.thecampbellinstitute.org/file/download.php?id=20130925358263a8956de938e7c00a2bbbb8413d

<sup>&</sup>lt;sup>8</sup> http://www.thecampbellinstitute.org/file/download.php?id=2015092336b107f72d10a379134af9249d3457ab



### Safety Assessments

The policy states that the Safety Assessments may be made mandatory in the future through formal rulemaking (p. 15). The National Safety Council supports initiating such a rulemaking if NHTSA finds submitted Safety Assessments do not adequately address the safety of roadway users.

The process outlined in the Safety Assessment is a powerful motivator for automakers and technology providers to think critically about various safety aspects of their technology. The current Safety Assessment outline is also comprehensive in that it addresses nearly every aspect of the automation lifecycle –ethical and privacy considerations in design; whether it has an appreciable impact on safety; driver interaction with technology; crashworthiness of the vehicle in case of a crash, and more.

Allowing industry to cooperatively seek solutions first may also have the added benefit of fostering increased cooperation amongst suppliers and automakers as they seek to achieve attainable solutions.

## Addressing driver underload

As outlined in NHTSA's <u>report</u> on automated driving concepts for Levels 2 and 3 (p. 25, 2014), one of the main human factor risks of partially automated vehicles is under-stimulating the driver so that he or she might be less likely to respond in transfer-of-control scenarios.<sup>9</sup>

While transfer-of-control considerations are already discussed in the Safety Assessments through topic five, "Human Machine Interface," considerations specific to driver underload issues are not currently addressed (p. 22). For example, for Levels 2, 3 and 4 systems, what aspects of the vehicle or technology ensure the driver has a high enough level of attention throughout the drive that they would be able to intervene in an emergency? Today, drivers face increased visual and cognitive distraction from phones and other external devices brought into the car as well as infotainment systems built into the vehicle. Drowsy or impaired drivers represent a significant risk cohort with evidence that over one-third of highway deaths involve these drivers. And there will likely be other distractions that will affect otherwise attentive drivers that we have yet to consider. Some mechanism may be required to ensure drivers remain alert in Level 2, 3, and 4.

## Applicability of Levels 3, 4 and 5 Safety Assessments to Lower-Level Systems

The National Safety Council calls on the AV policy guidance to address lower-level automation systems, including Level 2, in the Safety Assessments (p. 31). The Council agrees that all active safety technologies should be held to the same rigor of documentation as proposed in the policy's 15-topic Safety Assessments.

The Council encourages NHTSA to initiate guidance to require technology makers to submit some form of Safety Assessments for Levels 2 technologies. These Safety Assessments might touch upon the topics already identified (p. 31 and 32). The Council suggests this be a separate action taken prior to the rulemaking process to make HAVs subject to Safety Assessments. That rulemaking could take months or years. There are Levels 0, 1 and 2 safety features already in cars today for which we lack clear understanding of how they improve safety. If Safety Assessments are required for these lower-level systems, NHTSA will gain operational experience as these systems become more complicated and serve as foundation technologies for HAVs.

making our world safer\*

<sup>&</sup>lt;sup>9</sup> As described by NHTSA, driver underload refers to "a situation in which the driver is under-stimulated, which may lead to fatigue, boredom, reduced levels of operator alertness, and sensation-seeking behaviors."



Further, it seems clear that providing these assessments would greatly benefit the driving public today. Some currently deployed ADAS systems do not clearly indicate basic information, such as whether a system is currently engaged, unavailable, experiencing a malfunction, or needing driver intervention.

NSC believes that fully automated vehicles have the potential to save lives and prevent injuries in the future. That is why, in addition to leading a national public education campaign, we are heading the Road to Zero coalition which will include ADAS and fully autonomous vehicles as part of the solution to eliminate roadway fatalities. This AV policy has started the conversation about how to safely integrate these vehicles in our fleet, and I appreciate your consideration of NSC feedback. By training and educating operators in new and innovative ways and by learning from these technologically evolving vehicles, we can lead the world in improving roadway safety.

Sincerely,

Deborah A.P. Hersman President & CEO