



STATEMENT OF JACQUELINE S. GILLAN

**PRESIDENT
ADVOCATES FOR HIGHWAY AND AUTO SAFETY**

ON

“PAVING THE WAY FOR SELF-DRIVING VEHICLES”

SUBMITTED TO THE

COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION

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Introduction

Advocates for Highway and Auto Safety (Advocates) is a coalition of public health, safety, and consumer organizations, insurers and insurance agents that promotes highway and auto safety through the adoption of federal and state laws, policies and regulations. Advocates is unique both in its board composition and its mission of advancing safer vehicles, safer drivers and safer roads. We respectfully request that this statement and the comments Advocates submitted to the public docket in response to the National Highway Traffic Safety Administration (NHTSA) “Federal Automated Vehicles Policy” (AV Guidelines) Notice and Request for Comments,ⁱ which are attached, be included in the hearing record.

Motor Vehicle Deaths are Climbing

According to the federal government, each year motor vehicle crashes kill tens of thousands and injure millions more at a cost to society of over \$800 billion.ⁱⁱ Unfortunately, deaths resulting from motor vehicle crashes are on the rise. According to NHTSA, in 2015 our nation experienced the largest percentage increase of motor vehicle deaths in nearly fifty years.ⁱⁱⁱ More than 35,000 people were killed on our nation’s roads, representing a 7.2 percent upturn.^{iv} Preliminary information for the first nine months of 2016 appears to be even worse, indicating an 8 percent rise in fatalities compared to the same time period in 2015.^v Advocates firmly believes that automated vehicle (AV) technology has the potential to make significant and lasting reductions in this mortality and morbidity toll.

Advocates Has Consistently Promoted Advanced Technologies in Vehicles to Save Lives and Prevent Injuries

Advocates has always enthusiastically championed vehicle safety technology and for good reason. It is one of the most effective strategies for preventing deaths and injuries. NHTSA has estimated that since 1960, over 600,000 lives have been saved by motor vehicle safety

technologies.^{vi} In 1991, Advocates led the coalition that supported bipartisan legislation sponsored by former Senators John Danforth (R-MO) and Richard Bryan (D-NV) that included the airbag mandate in the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991.^{vii} As a result, by 1997, every new car sold in the United States was equipped with a front seat airbag and the lives saved have been significant. In fact, airbags save over 2,000 lives annually.^{viii}

Advocates continued to build on this success by supporting additional lifesaving technologies as standard equipment in all vehicles in other legislation and regulatory proposals. These efforts included: tire pressure monitoring systems;^{ix} rear outboard 3-point seat belts;^x electronic stability control;^{xi} rear seat belt reminder systems;^{xii} rear view cameras;^{xiii} brake transmission interlocks;^{xiv} seat belts on motorcoaches;^{xv} electronic logging devices;^{xvi} and, crash avoidance systems such as automatic emergency braking. These safety advances have saved hundreds of thousands of lives and have been accomplished because of the bipartisan leadership of the Members of the Senate Commerce, Science and Transportation Committee.

NHTSA Has a Statutory Duty to the Public to Ensure the Safety of Autonomous Vehicles

Fifty years ago, Congress passed the National Traffic and Motor Vehicle Safety Act of 1966 because of concerns about the death and injury toll on our highways.^{xvii} The law required the federal government to establish federal motor vehicle safety standards (FMVSS) to protect the public against “unreasonable risk of accidents occurring as a result of the design, construction or performance of motor vehicles.”^{xviii} While motor vehicles have changed dramatically since that time and will continue to do so in the future, the underlying premise of this prescient law and NHTSA’s safety mission have not.

Unfortunately, NHTSA has chosen to issue only “voluntary guidelines” for the development of AVs. Voluntary guidelines are not legally binding, are unenforceable and, therefore, are inadequate to ensure safety and protect the public. Manufacturers may choose to deviate from the guidelines or ignore them entirely at any time and for any reason including internal corporate priorities such as cost or marketing considerations. In addition, some entities may choose to follow the guidelines while others may not, creating a dangerous patchwork of noncompliance. Consumers and NHTSA also have no legal recourse against a manufacturer’s failure to follow the guidelines. NHTSA cannot bring an enforcement action, force a statutory recall, or even influence a voluntary recall for failure to abide by the guidelines.

A Functional Safety Approach is Essential to Provide the Framework for the Design, Development and Deployment of Autonomous Vehicle Technology

Before the widespread introduction of AV technology to the commercial marketplace and deployment on public roads, NHTSA must establish basic safeguards to protect the public. Advocates strongly recommends that AV manufacturers be required to meet a “functional safety standard” to guarantee safety to the maximum extent feasible of the overall system performance. While manufacturers will still have to certify vehicles meet all applicable FMVSS that address the mechanical operation of vehicle safety systems, a functional safety standard would apply to the AV operating system to ensure that the controlling software performs as designed.

Functional safety is a well-known process by which a product is designed, developed, manufactured and deployed to ensure that the product, as a whole, will function safely, as intended, and will prevent or mitigate misuse which could lead to unsafe conditions. A similar process is currently utilized by the Federal Aviation Administration (FAA) in portions of its regulations to ensure safety while encouraging innovation.^{xix}

Additionally, the submission of a Safety Assessment Letter (SAL) must be mandatory and not at the whim or choice of a manufacturer. There is too much at stake to allow optional and discretionary adherence. Under a functional safety standard, a manufacturer must certify to NHTSA through the mandatory submission of a SAL that the AV has been tested to ensure that it will operate properly and safely under the conditions the vehicle is designed to encounter (i.e., congestion, weather and road conditions, human/machine interface and vehicle interaction with other road users). The mandatory submission of the SAL should include all information required by the Secretary of Transportation including test results and data to support the conclusion that the AV system functions as designed. This submission should also include any negative test results and data that may indicate the AV system did not always function as designed along with information and data indicating how these issues were resolved by the manufacturer. In addition, any and all documentation regarding how cybersecurity threats were addressed should be included.

Prior to introduction of the AV system into the stream of commerce, NHTSA would review the SAL, test results and data, and then consult with the manufacturer. The manufacturer would be required to respond to any questions or concerns from the agency. This process is intended to allow NHTSA to bring to the manufacturer's attention any issues and/or problems the agency identifies in the SAL information, tests results and data supplied by the manufacturer prior to introduction of the AV system into the marketplace. This process would provide NHTSA with technical information about products coming to market and provide AV manufacturers with technical feedback in an efficient and effective process. The SAL and the questions raised by

NHTSA, however, are not intended as pre-market approval. The manufacturer, after having responded to the agency's inquiries, may introduce the AV system into the stream of commerce.

Additional Authorities and Resources are Critical

Regulating AVs presents unique challenges for NHTSA, and those issues warrant the agency being given additional tools to protect against potentially catastrophic defects. Flaws or viruses in computer software of AVs could adversely affect thousands of vehicles simultaneously. The NHTSA, therefore, must be given imminent hazard authority in order to expedite the grounding of vehicles that the agency has identified as having a potentially dangerous software problem that could lead to crashes, deaths and injuries. Also, because of the potential serious nature of any software problem that could affect thousands of vehicles and result in deaths and injuries, the ability to levy criminal penalties is essential. Criminal penalties will deter manufacturers and suppliers from knowingly and willfully permitting the manufacture and sale of AV systems with flawed software operating systems that could pose a danger to human life in the event of a crash.

Providing further broad statutory exemptions from the FMVSS for AVs is both unnecessary and unwise. There is already a statutory process in place for manufacturers to seek an exemption from the FMVSS that Congress enacted only two years ago. Pursuant to Section 24404 of the Fixing America's Surface Transportation (FAST) Act^{xx} codified at 49 USC Section 30112(b)(10), manufacturers of AVs are permitted an unlimited number of vehicles that can be exempt from one or more of the FMVSS for testing or evaluation. Exempt vehicles under this provision may not be sold or resold to the public. Furthermore, under 49 USC Section 30113 a manufacturer may receive an exemption from compliance with the FMVSS for the sale of a vehicle for not more than 2,500 vehicles to be sold in the United States in any 12-month period.

Until a functional safety standard is applied to AVs, this cap should not be raised from its current level.

Manufacturers may seek appropriate exemptions under the current process until NHTSA revises the FMVSS for level 4 and 5 AVs. However, while level 4 and 5 AVs may be exempt from parts of certain FMVSS or other regulations, much of the performance standards for safety systems would still apply. For example, even if a brake pedal is not needed for AV control, the rest of the brake system requirements in FMVSS 135 will still be needed to ensure the AV controls can stop the vehicle within the required stopping distance. Even for level 4 and 5 AVs, manufacturers will still have to certify to most performance requirements of the existing FMVSS. However, because level 2 and 3 AVs will still require significant operation by a human driver, these vehicles should not be exempt from compliance with the current body of FMVSS and regulations.

Vehicle and technology companies are already putting some AVs out on public roads and beginning to market these systems to the public. The development of AV technology is not just taking place in the United States. In fact, AVs are being tested throughout the globe in places such as the United Arab Emirates and Singapore.^{xxi} Vehicles imported from overseas have to meet the requirements of the FMVSS. However, if only voluntary guidelines are in place for AVs, foreign companies and entities may export products that are dangerously unsafe and NHTSA will have little recourse. In addition, some in the motor carrier industry have predicted that automated technology will be placed in trucks before passenger vehicles.^{xxii} The potential for an 80,000 pound rig using untested and unregulated technology on public roads is a very real

scenario if NHTSA continues to merely rely on voluntary guidelines and the “good intentions” of manufacturers introducing automated technology.

It is essential that NHTSA immediately adopt a functional safety standard to minimize public exposure to unreasonable risks of motor vehicle crashes involving these experimental systems. For example, the fatal crash of a Tesla Model S in Florida in May 2016, could have been averted had a functional safety standard required due diligence testing of the Autopilot System prior to deployment. The driver was using the Tesla Autopilot system when the vehicle passed under the side of a truck trailer that was turning across the highway, resulting in the fatality of the driver. After the crash, Tesla admitted to NHTSA that it had considered misuse of the Autopilot system including distracted driving and the use of the system outside preferred environments and conditions. Under a functional safety standard, if the misuse was foreseeable, Tesla would be required to address the misuse prior to confirmation to NHTSA that the vehicle was safe.

Recommendations:

- **NHTSA must require that manufacturers meet a “functional safety standard” to guarantee safety of AVs before they are introduced into the marketplace.**
- **Manufacturers must be required to submit a Safety Assessment Letter (SAL) that confirms that the AV has been tested to ensure it operates safely. The SAL should include all of the test results and data to support the conclusion that the AV system functions as designed.**
- **NHTSA should be given the additional tools of imminent hazard authority to protect against potentially catastrophic defects with AVs and criminal penalties to ensure manufacturers do not willfully mislead or misinform the agency.**
- **Providing further broad statutory exemptions from the FMVSS for AVs is both unnecessary and unwise. Until NHTSA revises the FMVSS for level 4 and 5 AVs, manufacturers may seek appropriate exemptions under the current process.**

Autonomous Vehicles Must Have Adequate Cybersecurity and Privacy Standards to Protect the Public and Must Share Information on Critical Events

A failure to adequately secure AV systems and to protect against cyber-attacks could endanger AV passengers, non-AV motorists, pedestrians, bicyclists and other vulnerable roadway users. It could also clog roads, stopping the movement of goods and hindering the responses of emergency vehicles. NHTSA should identify cybersecurity problem areas and require specific responses from manufacturers as to how those are being addressed. Problem areas could include subjects such as global position system (GPS) signal loss or degradation, spoofing, and off-line and real time hacking of single vehicles or fleets of vehicles. AV cybersecurity should be tested as part of the functional safety standard to ensure that the vehicle cybersecurity system operates as designed. The potential and real risk of a malevolent computer hack impacting hundreds or thousands of AVs, perhaps whole model runs, makes strong cybersecurity protections a crucial and essential element of AV design.

Additionally, data sharing among manufacturers is essential to improve overall safety among AVs. Data and information about known flaws or problems encountered during development and while in use must be shared among manufacturers and with NHTSA and the public to ensure that all AV systems are learning about problems in real time and can benefit from the experience of other AV systems. This type of collaborative development is already taking place in the industry with the creation of the Automotive Information Sharing and Analysis Center (ISAC). Data sharing will expedite solutions to unusual or unique safety problems and ensure they are readily identified and corrected.

Similarly, AVs should be subject to binding privacy standards to ensure that data is not abused. The recording and sharing of data will be critical to achieving the safest performance of AVs. Keeping the public informed as to the importance of sharing data and ensuring their privacy will also be critical to ensure public participation and acceptance. The industry and regulators must guarantee that data is protected and only used for the purposes of improving safety, and not for other commercial uses, such as the marketing of products based on vehicle location, which could turn the public against data sharing.

Recommendations:

- **AVs must have adequate cybersecurity and privacy standards to protect the public.**
- **AVs should be subject to binding privacy standards to ensure that consumer data is not used for purposes other than improving the safety and security of AVs.**

The Development of Autonomous Vehicles Must Be Transparent or Public Confidence in the Technology Will Suffer

The development and deployment of AVs as well as NHTSA's role in regulating this technology must be open and transparent. All non-proprietary communications and responses between the agency and a manufacturer as it relates to any issues involving AVs must be made available for public review and scholarly research. All data generated from the testing and deployment of AVs, except for trade secrets and private individual information must also be made public. Lack of transparency will severely undermine the public's confidence in this new technology and inhibit its widespread adoption.

Opinion polls already show strong public skepticism and hesitation about AVs and those doubts are surely warranted. Over the last few years, automakers have hidden from the American public and regulators safety defects that have led to numerous unacceptable and unnecessary deaths and

injuries as well as the recall of tens of millions of vehicles. Consumer acceptance of this technology is critical to the success of fully realizing the lifesaving potential of AVs. Trial by error on public roads and risking public safety is neither the appropriate nor the responsible approach to encouraging the development and deployment of AVs. In fact, a national survey commissioned by Kelley Blue Book found that a large portion of the public is resistant to accepting AVs. Fifty-one percent of respondents replied that they prefer to have full control of their vehicle, even if it's not as safe for other drivers. Additionally, awareness of the higher levels of vehicle autonomy is limited, with 6 out of 10 people saying they know little or nothing about AVs. For half of the respondents, the perception of safety and personal comfort with autonomous technology diminished as the level of autonomy increased. In fact, 80 percent believed that people should always have the option to drive themselves, and nearly one in three respondents said they would never buy a level 5 vehicle.^{xxiii}

A recent study conducted by the Massachusetts Institute of Technology garnered similar results. Only 13 percent of those polled reported that they would be comfortable with vehicle "features that completely relieve the driver of all control for the entire drive."^{xxiv} In addition, 59 percent of respondents reported that the maximum level of automation that they would be comfortable with were "features that actively help the driver, while the driver remains in control."^{xxv} The reluctance and hesitation of the public to embrace AVs will not be abated if the technology fails, the government regulators are viewed as standing on the sidelines and manufacturers have not done due diligence in conducting adequate testing before rushing to the marketplace. Consumers expect, and in fact, demand that the federal government prohibit the introduction of dangerous products to the marketplace whether it be drugs, food, toys, or driverless cars.

Recommendation:

- All non-proprietary communications and responses between the agency and a manufacturer as it relates to any issues involving AVs must be made available for public review and scholarly research.

States Must Not be Preempted from Acting to Protect their Citizens Especially in Light of NHTSA's Failure to Regulate Automated Vehicles to Date

Advocates agrees with the statutory mission of NHTSA to regulate the design and performance of motor vehicles to ensure public safety which, in modern day terms, includes autonomous vehicles and technology. However, unless and until NHTSA issues comprehensive standards and regulations to govern the AV rules of the road, states have every legal right, indeed a duty to their citizens, to fill the regulatory vacuum with state developed proposals and solutions for ensuring public safety. NHTSA, by issuing only guidelines, has left the field of AV safety open to the states to fulfill their traditional role of protecting the health and welfare of their citizens.

As the National Conference of State Legislatures (NCSL) noted in its comments to NHTSA's guidelines, "Without any indication on forthcoming federal regulations regarding the safe operation of HAVs, states may be forced to fill the gap in order to ensure the safety of public roadways."^{xxvi} Moreover, the Pennsylvania Department of Transportation stated in its comments to the guidelines that "Yes, there should be consistent treatment of highly automated vehicles nationwide. However, where the adoption of 'safety standards' being applied to highly automated vehicle testing is totally voluntary (as opposed to self-certifying as against a regulatory framework in the FMCSS) [sic], what level of comfort does that give to the states and their citizens that their transportation and law enforcement agencies are properly discharging their duty to ensure that highly automated vehicles are in fact safe?"^{xxvii}

Recommendation:

- Until NHTSA issues comprehensive standards and regulations to govern the AVs, states must not be precluded from filling the regulatory void with state developed solutions to protect their citizens.

NHTSA Needs Additional Resources

The increase in motor vehicle fatalities combined with the demands being placed on NHTSA with regards to the advent of AV technology necessitates an increase to the agency budget.

While the FAST Act did provide some additional resources, it is still inadequate to manage the myriad of challenges facing the agency. Today, 95 percent of transportation-related fatalities, and 99 percent of transportation injuries, involve motor vehicles on our streets and highways.

Yet, NHTSA receives only one percent of the overall U.S. Department of Transportation (DOT) budget. NHTSA will face even greater challenges in the future as AVs continue to develop and are introduced into the market. For NHTSA to exercise proper oversight over AVs, the agency will need to hire more staff with technical expertise. Moreover, given that crashes impose a comprehensive cost to society of \$836 billion, \$242 billion of which is direct economic costs such as lost productivity, medical costs and property damage, it is critical to advance serious measures to combat a serious problem.^{xxviii}

Recommendation:

- NHTSA must be given additional funding in order to meet demands being placed on the agency with regard to the advent of AV technology.

Conclusion

Autonomous vehicles have the potential to change our nation's ability to protect motorists and other road users. It is critically important that we do everything possible to advance this life-saving technology in as safe and expeditious manner possible. Advocates believes that autonomous vehicles will not only change our lifestyles but it may, once and for all, change our

ability to achieve meaningful and lasting reductions in the death and injury toll on our streets and highways.

ⁱ 81 F.R. 65703 (Sept. 23, 2016); DOT Docket No. NHTSA-2016-0090.

ⁱⁱ The Economic and Societal Impact of Motor Vehicle Crashes, 2010 (Revised), HS 812 013, U.S. DOT, NHTSA (May 2015 (Revised)), available at <http://www-nrd.nhtsa.dot.gov/Pubs/812013.pdf>. (NHTSA Cost of Motor Vehicle Crashes Report).

ⁱⁱⁱ National Center for Statistics and Analysis, *2015 motor vehicle crashes: Overview*, Report No. DOT HS 812 318, National Highway Traffic Safety Administration (Aug. 2016).

^{iv} *Id.*

^v National Center for Statistics and Analysis, *Early Estimate of Motor Vehicle Traffic Fatalities for the First 9 Months of 2016*, Report No. DOT HS 812 358, National Highway Traffic Safety Administration (Jan. 2017).

^{vi} Lives Saved by Vehicle Safety Technologies and Associated Federal Motor Vehicle Safety Standards, 1960 to 2012, DOT HS 812 069 (NHTSA, 2015); See also, NHTSA AV Policy, Executive Summary, p. 5 endnote 1.

^{vii} Pub. L. 102-240 (Dec. 18, 1991).

^{viii} National Center for Statistics and Analysis, Lives Saved in 2015 by Restraint Use and Minimum-Drinking-Age Laws, National Highway Traffic Safety Administration, Report No. DOT HS 812 319 (Aug. 2016).

^{ix} Transportation Recall Enhancement, Accountability, and Documentation (TREAD) Act, Pub. L. 106-414 (Nov. 1, 2000).

^x Anton's Law, Pub. L. 107-318 (Dec. 4, 2002).

^{xi} Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), Pub. L. 109-59 (Aug. 10, 2005).

^{xii} *Id.*

^{xiii} Cameron Gulbransen Kids Transportation Safety Act of 2007, Pub. L. 110-189 (Feb. 28, 2008).

^{xiv} *Id.*

^{xv} Moving Ahead for Progress in the 21st Century (MAP-21) Act, Pub. L. 112-141 (Jan. 3, 2012).

^{xvi} *Id.*

^{xvii} Pub. L. 89-563 (Sept. 9, 1966).

^{xviii} Title 49, U.S.C. Sec. 30102.

^{xix} See, e.g., 14 USC Subpart F – Equipment, §§ 25.1301, *Function and installation*, and 25.1309, *Equipment, systems, and installations*.

^{xx} Pub. L. 112-141 (Dec. 4, 2015).

^{xxi} 2025 AD Newsletter, MIDDLE EAST COMBATS ROAD DEATHS WITH DRIVERLESS CARS (Nov. 2016) available at: <https://www.2025ad.com/the-week-in-ad/arab-emirates-driverless-cars/>; Andrew Hawkins, *One of Europe's largest carmakers will test its self-driving cars in Singapore*, The Verge (May 3, 2017).

^{xxii} Seth Clevenger and Eric Miller, ATA's Chris Spear Calls for Industry to Embrace Technology, Transport Topics (Mar. 2, 2017).

^{xxiii} Kelly Blue Book, Future Autonomous Vehicle Driver Study (Sept. 2016).

^{xxiv} H. Abraham, B. Reimer, B. Seppelt, C. Fitzgerald, B. Mehler & J. Coughlin, *Consumer Interest in Automation: Preliminary Observations Exploring a Year's Change*, Massachusetts Institute of Technology, AgeLab, White Paper (2017-2), p. 6 (May 2017).

^{xxv} *Id.*

^{xxvi} William T. Pound, Executive Director, National Conference of State Legislatures, *Public Comments on Federal Automated Vehicles Policy*, Docket No.: NHTSA-2016-0090 (Nov. 21, 2016).

^{xxvii} Leslie R. Richards, Secretary of Transportation, Commonwealth of Pennsylvania, *Letter to Secretary Foxx and Administrator Rosekind*, Docket No.: NHTSA-2016-0090 (Nov. 21, 2016).

^{xxviii} NHTSA Cost of Motor Vehicle Crashes Report.