

**Testimony of  
Dr. James C. Owens, Acting Administrator  
National Highway Traffic Safety Administration  
Before the  
Committee on Commerce, Science & Transportation  
United States Senate  
Highly Automated Vehicles: Federal Perspectives on the Deployment of  
Safety Technology  
November 20, 2019**

Good morning, Chairman Wicker, Ranking Member Cantwell, and members of the Committee. I am James Owens, Acting Administrator of the National Highway Traffic Safety Administration (NHTSA). Thank you for inviting me to testify today on the subject of NHTSA's efforts, under the leadership of Secretary Chao, to facilitate the safe testing and deployment of advanced vehicle technologies, such as Automated Driving Systems (ADS).

Safety is the Department's and NHTSA's number one priority, and we are committed to reducing crashes, preventing death and serious injuries, and lowering the economic costs of roadway crashes. The agency works to enhance vehicle and highway safety by using the wide array of tools at our disposal.

First and foremost, everything at NHTSA begins with data: it drives our research, rulemakings, enforcement activities, and public education campaigns. We collect safety data that helps all NHTSA stakeholders better identify challenges and opportunities for improvement.

We conduct research on emerging technologies, safety issues, and ways to improve the safety of current motor vehicles and motor vehicle equipment. We also research human behavior to identify ways to encourage people to make safer choices when driving and to avoid driving when drowsy or impaired.

Next, we promote investment in improving vehicular safety, first by establishing minimum safety standards for motor vehicles and motor vehicle equipment. We also evaluate and rate new vehicles through our New Car Assessment Program (NCAP), empowering consumers with safety information to help them select the best vehicles for their needs and—because consumers value safety—this creates market-based incentives for manufacturers to design safer vehicles to earn higher ratings.

At all times—including where our regulations have not adopted minimum standards—we stand ready with the full force of our enforcement tools to protect the public, to investigate potential safety issues, and to compel recalls when we find evidence of noncompliance or an unreasonable risk to safety. Our enforcement and defect authority is broad, and we do not hesitate to use it when we detect an unreasonable risk to public safety.

Finally, we partner with State and local officials, including law enforcement, to improve highway safety. We also work with many stakeholder partners to

develop advertising campaigns to educate the public and encourage drivers to make safer choices, using resources provided to NHTSA by Congress.

Our efforts are having an impact—over the past 50 years, our nation has seen a dramatic decline in crash fatality rates. In fact, the fatality rate in the early 1970s was about four times higher than today; the percentage of alcohol-impaired driving fatalities declined from nearly 50% of all fatalities in 1982 to less than 30% in 2018; and seat belt use has increased to about 90% nationwide.

We are proud that, through the adoption of improved safety features and other lifesaving technologies such as air bags and electronic stability control, new vehicles have become much safer. Recent data indicates that vehicle occupants have a significantly greater chance of surviving a serious crash if they are in a newer vehicle than in an older one. These technological improvements to vehicle safety are the combined result of NHTSA's safety standards and the voluntary investments that automakers have made in response to consumer demand for enhanced safety.

But we still have a long way to go. While we are pleased that fatalities on our nation's roadways fell by 2.4% in 2018, or 913 fewer lives lost than in 2017, we also must remember that 36,560 people were killed in traffic crashes in 2018. That's more than 36,000 families who lost loved ones. Our efforts to reduce fatal crashes and serious injuries will continue by promoting additional investment and

innovation to reduce the incidence of crashes, and to reduce the severity of crashes when they do occur.

One of the primary causes of serious crashes is human error. Our research indicates that four behavioral factors are involved in the vast majority of roadway fatalities: speeding, driving while impaired by drugs or alcohol, failing to wear seatbelts, and driving while distracted. NHTSA works closely with our State and local partners on high-visibility enforcement and advertising campaigns to target these behaviors. Our efforts have helped to increase the use of seat belts and reduce the number of impairment-related crashes.

In addition to our work with State and local partners, we also believe that advanced technologies have the potential to make our roadways significantly safer. We have already seen technologies improve the occupant protection of vehicles, while crash avoidance technologies such as electronic stability control have avoided or mitigated thousands of crashes and saved thousands of lives over the past decade.

States are deploying technology for traffic safety using 75 megahertz in the 5.9 Gigahertz band set aside by the Federal Communications Commission. The purpose of this Safety Band is to keep a dedicated transportation safety communication channel. Now, new vehicle and infrastructure technology being developed here and elsewhere use this band to communicate between vehicles to

stop them from crashing, and between vehicles and infrastructure such as traffic lights to smooth traffic flow. Toyota is planning to deploy this technology in Japan and Volkswagen in Europe. The commitment of airwaves for transportation use was – and still is – a prudent decision.

Today, many manufacturers are developing and rolling out new advanced driver assistance systems (ADAS) such as automatic emergency braking and lane keeping assistance, which can help drivers avoid crashes or help reduce the severity of crashes that do occur. We expect that these and other developing technologies will help reduce fatalities among pedestrians and other vulnerable road users, and the early data on the efficacy of these technologies are promising.

It is critical that the public understands a vital fact about current technologies: all vehicles sold to the public today require a driver to be fully attentive and cognitively engaged in the driving task at all times. This is true even if the car is equipped with any of the ADAS technologies currently on the market. While these ADAS technologies are improving and enhancing safety, they are not self-driving. Misusing driver assistance systems by failing to maintain control of the operation of the vehicle at all times can result in serious and even deadly crashes. Consumer education is an important tool in ensuring that ADAS technologies are used in a way that enhances safety.

In addition to driver assistance technologies, we are seeing significant investments in more advanced Automated Driving Systems (ADS) that might one day allow vehicles to drive themselves and thereby have the potential to greatly reduce the number of fatal crashes involving human error or poor choices. ADS technologies may also enhance mobility for underserved communities and reduce congestion on our crowded highways. These technologies are being developed today by many different innovators, and NHTSA is actively participating by maintaining a close dialogue with developers to ensure that our safety concerns, including concerns about the cybersecurity of vehicles, are incorporated into the product development process.

Together, ADAS and ADS technologies are part of a technological revolution in transportation that promises to change our most basic assumptions about what vehicles can do.

But as with any revolution, these developments also carry uncertainty. Advanced technologies may not always work as designed or advertised. Driving is an extremely complex task, and developers acknowledge there will be substantial challenges in getting ADSs ready for deployment. As a result, we are likely to see an extended period during which ADS-equipped vehicles are being tested and deployed, likely only on a limited basis. If the history of other vehicle technologies is any guide, some versions of these technologies will work better

than others. But let me assure you: along with our State and local partners, NHTSA will continue to use all of its tools to support the safe development, deployment, and oversight of advanced vehicle technologies.

My testimony today will elaborate on the tools NHTSA leverages to promote safety with respect to both ADAS and ADS technologies, including data and research, rulemaking, enforcement, and public education.

### **Data and Research Tools**

A great deal of ADAS and ADS technology is still under development. Accordingly, many of NHTSA's current activities are focused on data collection and research to support updating and modernizing regulations for older technologies, and to support developing future test procedures for ADAS and ADS technologies. Some examples include: assessing the effectiveness of newer driver assistance systems, evaluating human interactions with ADS technology, studying the protection of occupants in alternative seating arrangements and orientations, and evaluating component and cybersecurity safety.

As we transition from traditional vehicles and those with limited ADAS features to ever increasing levels of automation, we will address the ability of drivers to assume control when necessary. In all but fully automated vehicles, which are not commercially available yet, driver readiness to resume control is

critical to safety. NHTSA is currently engaged in human factors research to evaluate various methods for notifying and engaging the human driver as needed to maintain safe operation of the vehicle.

One of the most exciting promises of ADS technology is the potential to provide mobility options not previously afforded to people with physical, sensory, and/or cognitive disabilities. As an example, accessible ADS-equipped vehicles are expected to provide information through appropriate modes to interact with vehicle occupants. Research is also underway to explore the information needs of people with disabilities.

Vehicles that are fully automated will affect more than just their operators and occupants. We are researching how these vehicles influence and take into consideration the behavior of pedestrians, bicyclists, and other humans and vehicles using the roadway. This type of research is needed to understand human behavior in response to automation and the new challenges such interactions will bring.

NHTSA is working closely with industry partners to broadly implement cybersecurity best practices. NHTSA encourages greater utilization of the Automotive Information Sharing Analysis Center (Auto-ISAC), which continues to grow, adding several new members in 2018 and releasing seven Auto-ISAC Best



Practices guides thus far. NHTSA is also working to update the agency’s “Cybersecurity Best Practices for Modern Vehicles” document.

For the past few years, NHTSA and the Society of Automotive Engineers (SAE) International have conducted joint government/industry cybersecurity workshops to discuss how to address critical issues unique to the automotive industry. The agency, along with many other Federal agencies and industry partners, participated in the U.S. Department of Homeland Security’s 2018 biennial exercise, Cyber Storm, and we are preparing now for the 2020 exercise.

Lastly, in coordination with the industry, NHTSA conducts and publishes innovative research into mitigation strategies, testing methods, system interfaces, and organizational preparedness that support the continuous improvement of cybersecurity of modern vehicles. Our researchers are in frequent contact with industry and developers to discuss their findings.

## **Guidance and Rulemaking Tools**

In addition to advancing critical research, NHTSA works closely with the industry and technology companies to promote safety as innovators develop ADAS and ADS technology.

“Automated Driving Systems: A Vision for Safety 2.0” (ADS 2.0), which was issued in September 2017, improved and further refined a flexible, non-

regulatory approach to ADS technology safety by supporting the automotive industry and key stakeholders, including State and local governments, as they further develop and design best practices for safe testing and deployment of ADS levels 3-5.

In October 2018, the U.S. DOT released “Preparing for the Future of Transportation: Automated Vehicles 3.0” (AV 3.0).<sup>1</sup> AV 3.0 builds on, but does not replace, the voluntary guidance provided in ADS 2.0, expanding the scope to all surface on-road transportation systems. As with ADS 2.0, AV 3.0 was developed with input from a diverse group of stakeholders. And, of course, it is critical that the United States maintain its leadership in the area of advanced vehicle technologies, and the evidence indicates that we are succeeding. In fact, at the June 2019 United Nations World Forum for Harmonization of Vehicle Regulations (WP.29) meeting, the Contracting Parties approved a Framework Document to guide the future work of the United Nations on Automated Vehicles. The framework is modeled on ADS 2.0, and was drafted by NHTSA staff in close cooperation with Japan, China, and the European Union.

NHTSA and the U.S. DOT’s guidance will evolve as technology does, with safety as the constant cornerstone of our policies and initiatives.

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<sup>1</sup> For more information on the Department’s AV activities, please see: <https://www.transportation.gov/AV>.

To help facilitate the development of advanced vehicle technologies, NHTSA uses its rulemaking tools to promote investment in improving vehicle safety. It establishes regulations to adopt minimum safety standards for motor vehicles, and minimum performance requirements for vehicles that are equipped with a specific technology.

Some of NHTSA's existing policies and regulations will require updating to address the innovative vehicle designs being introduced by ADS developers. Knowing this, NHTSA began exploring ways to address automation several years ago. Currently, NHTSA is working on numerous regulatory initiatives related to future governance of ADS technologies. Some of these initiatives seek comment on requirements that may not serve any safety purpose if applied to ADS-equipped vehicles and thus may unnecessarily increase their cost. Other initiatives address test procedure challenges introduced by some ADS-equipped vehicles.

Existing Federal Motor Vehicle Safety Standards (FMVSS) may present unintended and unnecessary barriers for future ADS vehicles without drivers. Historically, FMVSS have been based on the concept of a human driver operating the vehicle. With the introduction of ADS, the driving tasks will increasingly shift from humans to the system. The absence of a human driver creates opportunities for vehicle manufacturers to design new vehicle architectures that may remove driving controls, change seating configurations, and establish new interfaces for

passengers in a manner consistent with safety. The agency is gathering information to support decisions about potential adaptation of regulations to address unnecessary barriers to such innovative designs while ensuring that these vehicles would have equivalent levels of safety and performance to systems and components covered by existing safety standards. NHTSA issued an Advance Notice of Proposed Rulemaking (ANPRM) on May 28, 2019, to seek comments on existing motor vehicle regulatory barriers in the crash avoidance standards to the introduction and certification of ADS.

We are also undertaking several actions to update the process by which industry may seek exemptions from regulatory requirements. By proposing improvements to the current exemption processes, we hope to facilitate testing and enhanced safety oversight by allowing a wider variety of entities to request exemptions to operate nonconforming vehicles on public roads for purposes of research and demonstrations. One NPRM, titled “Expansion of Temporary Exemption Program to Domestic Manufacturers for Research, Demonstrations, and Other Purposes,” will propose new submission and reporting requirements for vehicles to be exempted, mirroring those applicable to exempted imported vehicles.<sup>2</sup> All such exemptions would require demonstration that the vehicles would have an equivalent level of safety to our existing standards.

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<sup>2</sup> See <https://www.reginfo.gov/public/do/eAgendaViewRule?pubId=201904&RIN=2127-AM14>.

## **Enforcement Tools**

All new vehicles, including ADS-equipped vehicles, must comply with existing FMVSS, and all motor vehicles and motor vehicle equipment are subject to NHTSA's broad and powerful safety defect authority. That means that defective vehicles and equipment must be recalled and repaired when the manufacturer or the agency determines that the vehicles or equipment present an unreasonable risk to safety. Manufacturers are required to notify NHTSA and owners of any safety-related defects and remedy those defects for free.

While NHTSA is committed to working with industry to foster innovation and remove unnecessary regulatory barriers to the development of advanced safety technologies, the agency's first and foremost priority is safety. As manufacturers develop and test advanced vehicle technologies, NHTSA will continue to engage in ongoing dialogue with innovators to ensure that our safety concerns are incorporated in product development, and we will also remain vigilant to ensure these innovative technologies do not pose an unreasonable risk to safety. As ever, the agency will not hesitate to use its enforcement authorities when it is necessary and appropriate to protect the safety of the traveling public.

## Public Education Tools

NHTSA understands that realizing the lifesaving potential of advanced vehicle technologies will rely heavily on consumer acceptance, and so it is vital to build public confidence through education and outreach. We believe this is a crucial component to fostering transparency and understanding of these systems.

To promote public engagement and transparency around the testing and development of ADS technologies, the agency established the voluntary safety self-assessment (VSSA) as a mechanism for entities that are developing and testing ADSs to communicate how they are prioritizing safety. As companies release VSSAs, NHTSA creates links to these materials on its VSSA Disclosure Index website.<sup>3</sup> It has been our experience that most companies approach the agency before publishing VSSAs, and the agency stands ready to assist by providing technical feedback as the documents are developed.

Additionally, in order to promote transparent public engagement, when companies petition NHTSA for exemptions from any of the FMVSSs for testing or deployment of ADS-equipped vehicles, the agency issues a public Request for Comment to take into consideration public input before granting or denying a request. If it grants such a petition, the agency will decide what terms and

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<sup>3</sup> To view the VSSAs currently available, please visit: <https://www.nhtsa.gov/automated-driving-systems/voluntary-safety-self-assessment>.

conditions should be placed on the grant to promote public safety and provide data needed to carry out its regulatory and oversight responsibilities.

NHTSA is also planning to conduct additional consumer market research to help identify the most effective ways to communicate and educate consumers about the different levels of driving automation. These efforts will also further inform NHTSA's media campaigns to increase consumer familiarity with advanced vehicle technologies, inform outreach efforts at consumer events, and enhance public facing materials on NHTSA's website.

Finally, NHTSA announced it will be updating NCAP, the agency's premier consumer information program for evaluating and communicating vehicle safety performance to consumers through 5-star safety ratings. NCAP is a powerful tool for promoting safety advances in vehicles. This year marks NCAP's 40th anniversary, and as with any program that has withstood the test of time, it continues to evolve to best empower the public to make more informed purchasing decisions. NHTSA recently announced plans to begin proposing major upgrades to NCAP in 2020. The agency will accelerate NCAP modernization to keep pace with newer safety technologies and help create additional market-based incentives for automakers to continue to invest in life-saving vehicle technologies. These upgrades reflect the comments and feedback we received from last year's public meeting, and they are expected to include new technologies, new test procedures,

updates to vehicle labeling, advancements in crash-test dummies, and continued consumer research to ensure NCAP's products are effectively meeting the public's need. The agency will also consider including newer technologies tied to pedestrian and bicyclist safety in NCAP. And because we know that consumers demand safety, NCAP modernization will continue to deploy market-based incentives and competitive pressure to drive further safety-enhancing innovation by industry.

## **Conclusion**

Innovation is advancing rapidly in the automotive sector, and the development of these technologies promises to save lives and reduce injuries on our nation's roads. NHTSA's work will continue to prioritize the safety of automobiles as they become more complex with more advanced and automated technologies. NHTSA will continue to engage industry, States, consumers, Congress, and other stakeholders to draft automated vehicle polices and regulations that position the United States as the world's leader in automated vehicle technology while fulfilling NHTSA's vital safety mission.

Again, thank you for the opportunity to testify before you today. I look forward to answering any of your questions and to continuing to work with you to save lives on America's roadways.