Ms. Heidi King  
Acting Administrator, National Highway Traffic Safety Administration (NHTSA)  
U.S. Department of Transportation  
1200 New Jersey Ave SE  
Washington, DC 20003.

Reference: Docket NHTSA-22017-0822 Automated Driving Systems 2.0

Dear Acting Administrator King,

Thank you for the opportunity to provide comments to the September 12, 2017 Automated Driving Systems (ADS): A Vision for Safety 2.0. The Intelligent Transportation Society of America (ITS America) believes that continued NHTSA guidance is important and commends NHTSA for updating baseline set up assumptions regarding the treatment of new “automated driving systems” (ADS) systems.

ITS America is an association public and private organizations that are focused on advanced vehicle technology, smart cities, and new models for mobility. Our members include auto, telecomm, traditional IT and emerging tech, and consumer apps and industrial electronics. We also include public agencies and non-profits, such as road, transit and other transportation infrastructure operators and the research community focused on bringing new technology from the lab to our roads, cars, buses and trucks. Our objective is to grow our economy and improve our quality of life through innovative technologies that enhance the mobility, safety, security, privacy, sustainability and accessibility of our transportation system in the next decade. Safety, security and privacy are critical and must be addressed by the technology sector along the entire technology lifecycle—in design, development, deployment, and operations. ITS America seeks to grow collaboration within industry and between private and public sectors in these critical areas.

One of ITS America’s key priorities for 2017 has been to establish the foundation for the deployment of automated and connected vehicles. Public confidence in the safety of the technology must be first achieved and then expanded in order for the technology to succeed commercially. We believe that industry and the research community must focus their efforts on creating a comfort-level regarding safety assurance, testing, and deployment. In particular, we have actively engaged with state and local safety regulators, and advocates to address their concerns about testing as well as to help them in establishing processes that would help the transition from testing to larger scale deployment. We have also sought to advocate for changes or clarifications to Federal Motor Vehicle Safety Standards or other authorities to support new technologies. We have been active in educating key stakeholders on issues in reference the AV START Act (S 1885) and the SELF-DRIVE Act (HR 3388).

ITS America believes the potential improvements in safety and mobility that highly automated vehicles (Society of Automotive Engineers [SAE] J3016 Levels 3 and above) can deliver may be enormous, but that further operational testing and other safety assurance groundwork is required. We think the NHTSA guidelines generally sets the right balance between the requirements for safety and flexibility needed for inventive strategies in the early days of the technology as it is proven through testing in real-world environments. ITS America generally agrees with NHTSA that its cease-and-desist authority addressing defects and unreasonable risks to safety allows the Agency to address unreasonable risks in testing- and later in early stage production-level automated vehicles. In particular, we agree with NHTSA that realigning federal policy with industry terminology and further clarification of state and federal roles is helpful.

One difference between the 2016 Federal Automated Vehicle Policy and the 2017 Automated Driving Systems (ADS): A Vision for Safety 2.0 is the shift in emphasis away from “performance” assessment for which objective standards today are difficult to specify and as a result are lacking in this domain, and design and validation practices and standards, which are more common but some instances may require adaptation or adjustment to apply
to ADS. We agree with NHTSA that that industry needs to follow a robust design and validation process based on a systems-engineering approach. We also agree on hazard analysis and safety risk assessment for ADSs is critical, but industry practice may not be transparent. The NHTSA’s June 2016 report, Assessment of Safety Standards for Automotive Electronic Control Systems,¹ which provides an evaluation of the strengths and limitations of such standards, however, still begs the question what combination of approaches, some of which are not native to automotive design practice, should apply.

But beyond design and validation, public perception of safety must be considered. The importance of public confidence in the success of self-driving technology cannot be dismissed. According to AAA, despite the prospect that autonomous vehicles will be safer, more efficient and more convenient than their human-driven counterparts, three-quarters of U.S. drivers report feeling afraid to ride in a self-driving car, and only 10 percent report that they would actually feel safer sharing the roads with driverless vehicles.²

Performance evaluation, in the form of testing and simulation, may help to establish public confidence in the technology. In their whitepaper, “From the Lab to the Street: Solving the Challenge of Accelerating Automated Vehicle Testing”³ University of Michigan professors Ding Zhao and Huei Peng argue that to create consumer acceptance of automated vehicles, tests will need to prove at a level of 80 percent confidence that the robotic vehicle is 90 percent safer than human drivers on the road. The distance test vehicles would need to be driven in simulated or real-world settings to get to that high confidence level would be 11 billion miles. (To put 11 billion miles in perspective, Google Waymo self-driving car achieved three million real world miles from 2009 to 2017, two thirds of those miles driven in the last two years, and 2.5 billion simulated miles.)⁴ Processes for accelerating testing and establishing use of best practices in safety design must be more fully considered by NHTSA in any subsequent updates of their policy.

Data sharing is also important. In our 2016 automated vehicle comments to NHTSA, we also noted that a number of items within the 15-point assessment, such as data sharing, privacy, consumer education, or even ethical considerations are beyond the scope of an ADS system under development, and that part of the purpose of prototyping and testing would be to explore these considerations and develop a more definitive strategy to address these items in a production level system. However, we do believe that these issues still need to be explored by industry and the research community to fully understand their impact. Our members have been active in these efforts, in particular in reference to simulation, testing and data collection for new systems. ITS America also believes that as production-level vehicles begin to be seen widely on public roads, data sharing such as “early warning” systems will help in identifying problems before they appear as fatality or injury crashes.

We think that industry in the long run will need to establish a collaborative data sharing and research capability, working closely with NHTSA, to identify potential rare scenarios (for example scenarios challenging even for human drivers) where ADS would have difficulty from an operational and safety assurance perspective. To begin this process, future NHTSA guidance on ADSs should include a section on data addressing standardization.

NHTSA should also consider research or principles addressing the safety of human-machine interfaces, in particular how drivers or passengers might handle transitions from automated driving to conventional driver or degraded operations, since these will impact traffic safety. Along these same lines, how ADS users with disabilities could interact with systems in the case of emergency is a topic that has not been fully explored by researchers and automotive designers and should be included to address accessibility implications of the new technology. (ITS America will be shortly publishing a report addressing disability and accessibility challenges in automated vehicle design and will address government and industry roles in promoting universal access to this innovative technology.)

ITS America also believes there is a long term role for states and local agencies to make road infrastructure and operations more accommodating and predictable for ADS. For automated vehicles to navigate safely, roadways must be better maintained and modernized, as traffic signals and ramp meters must be further standardized and connected, and road signage and lane markings must be upgraded. New driving conventions, such as how robotic

² AAA Vehicle Technology Survey – Phase II, March 7, 2017
³ From the Lab to the Street: Solving the Challenge of Accelerating Automated Vehicle Testing, Ding Zhao and Huei Peng, University of Michigan (M-City), May 2017
⁴ On the Road to Fully Self-Driving, Waymo Safety Report, 2017
vehicles might “wave through” pedestrians on crosswalks, or they how to identify and pull over for emergency vehicles, will be required for robotic vehicles to interact with other road users. Operations research must be conducted in order to ensure that the infrastructure operations and traffic codes can be adjusted where necessary to improve traffic safety while accommodating these new classes of advanced vehicles.

Lastly, ITS America suggests NHTSA take a wholistic view of automated vehicle that addresses need for cooperative safety. In particular, vehicle-to-vehicle, vehicle-to-pedestrian, and vehicle-to-infrastructure (V2X) communications can augment and support automated driving systems across all levels of automation allowing for smarter decision-making within a mixed fleet – where both conventional and automated vehicles will be operating on the same roads. V2X communication also supports coordinated driving automation such as vehicle platooning highway speed harmonization and intersection safety. V2X will will be necessary as automated systems grow in numbers and it is important to addressing safety in the transition period as driverless fleets mix in traffic and at intersections with conventional vehicles, motorcycles, bicycles and pedestrians.

ITS America encourages NHTSA to establish a dialogue with state and local transportation authorities, industry and the research community to address safety assurance and other challenges and ITS America as an association can help facilitate any such effort. ITS America is encouraged by NHTSA’s work on this guidance, and commits to helping our members work with the agency and others to create foundation for the deployment of this new life-saving technology.

Sincerely,

/s/ Steven Bayless

Steven H. Bayless
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Intelligent Transportation Society of America