

April 1, 2021

Wyatt Burr

Re: Docket NHTSA-2020-0106; Advanced Notice of Proposed Rulemaking

I. Introduction

I am a law student and a concerned member of the public. I am worried that the agency's ANPR indicates that the NHTSA is considering adopting a policy that would be harmful to the general public's health.

First, I commend the NHTSA for beginning this step in developing a safety framework for Automated Driving Systems (ADS). ADS are the auto industry's future and have the potential to change the way we approach transportation. This action falls well within NHTSA's statutory authority under the National Highway Safety Act and 49 U.S.C. § 30111, to prescribe practicable and objective motor vehicle safety standards. Developing Federal Motor Vehicles Safety Standards (FMVSS) for ADS vehicles is aligned with the agency's purpose of reducing traffic accidents the death and injuries that result from those accidents.

The agency should not delay creating actionable safety standards for ADS. Given the development pace, we can expect some fully automated vehicles to be ready for market in the 2030s. Todd Litman, *Autonomous Vehicle Implementation Predictions Implications for Transport Planning* (2021). The agency should act now to develop practicable mandatory technology standards to promote their statutory purpose of reducing traffic accidents and injuries.

II. Technology Standards vs. Performance Standards

1. Safety

Contrary to industry views, I would prefer that the NHTSA place greater importance on human health and safety than expediting novel technology to market.

In the past, the NHSTA has enforced Safety Standards under a required technology model, not by performance-based standards. When the agency can identify a superior technology in terms of safety among several candidates, the NTHSA should not hesitate to require its use in place of less effective methods. When the agency cannot identify a superior technology, it should instead establish specific technical options that autonomous vehicle manufacturers can choose from. The agency can then continue to evaluate the technologies before coming to a final conclusion. Proscribing in this manner

ensures that consumers are receiving the maximum amount of safety that the NHTSA can provide, in accordance with the agency's statutory purpose.

2. Innovation

The agency's concern over being too restrictive when mandating a technology is misplaced. The NHTSA has routinely regulated by requiring certain technologies to be installed in vehicles. Experience shows us that this method of regulation has not slowed safety innovation. Manufacturers continued to add safety features to cars well before the NHTSA mandated those safety features to be installed. Examples of this include passenger airbags, backup cameras, blindspot detection, and lane departure alerts. However, the NHTSA can still allow room for flexibility and ease innovation concerns while providing concrete guidance. The NHTSA can promote flexibility by soliciting comments from manufacturers and promulgating rules that give automakers a choice of technology to address a given safety concern. Firm and uniform guidance will be more easily administrable and allow manufactures to predict better what will be required of them.

If necessary, the agency can be even broader in its proscription, for example, requiring that each sensing device have at least two backup devices without detailing what those devices should be.

3. Mass Adoption

As the agency has identified, ADS has the potential to increase the safety of drivers and reduce death due to traffic accidents massively. The agency should therefore prioritize creating a policy that encourages mass adoption of ADS. A significant hurdle to adoption is the public perception of the safety and hazards inherent in ADS. The agency should also recognize that any accidents that occur during the beginning of ADS introduction to the market can significantly affect consumer confidence in the technology. The potential for decreased adoption should be weighed heavily in safety's favor when the agency is balancing safety with other factors.

4. Technology Standards

In order to accomplish both the goals of safety for early adopters and the eventual mass adoption of ADS technology, the agency should create mandatory standards that mirror traditional standards for motor vehicles while accounting for the unique capabilities and risks of autonomous vehicles. This method would reflect NHTSA's current approach to FMVSS and look similar in structure to NHTSA rules for Low-speed Vehicles. 49 C.F.R. § 571.500. There, the agency gave a new class of vehicles with unique characteristics, a list of required features that were different from the standards proscribed to traditional vehicles.

Similar to Low-speed Vehicles, the agency has now recognized that it is appropriate to account for the unique characteristics of ADS by creating a separate set of safety standards that apply only to ADS. The agency has accurately described those characteristics when describing "Core ADS Safety Functions" as: Sensing, Perception, Planning, and Control.

Another unique characteristic of ADS is its vulnerabilities to attack in ways that traditional vehicles are not. ADS reliance on sensors and wireless communication makes the vehicle vulnerable to various attacks, including GPS jamming and spoofing, camera blinding and illusion, LiDAR jamming, and LiDAR spoofing. Mashrur Chowdhury, Mhafuzul Islam and Zadid Khan, *Security of Connected and Automated Vehicles*, The Bridge. National Academy of Engineering (2019). The communication network required for Connected Autonomous Vehicles (CAV) that can "platoon" or closely follow each other to reduce air drag and improve efficiency is especially vulnerable to various cyber-attacks, including DDoS attacks, blackhole attacks, and Sybil attacks.

Any technology requirement would need to be tailored to address these unique characteristics. The issue of paramount importance is safety, and when safety features conflict with a driver's comfort, the agency should place safety first. In accordance with this principle, the agency should require that all ADS, which can be operated manually, have safety standards equal to traditional cars and additional special requirements that are necessary due to the unique characteristics of ADS.

III. Recommended Technology and Features

1. Manual Override

The overall complexity of an ADS is so enormous that neither the manufacturer nor the NHTSA can possibly test how the ADS will respond to every possible situation. The latent risk of unexpected response to an unforeseen event coupled with the risk of a malicious attack necessitates that all ADS have a manual fallback mode that the driver can operate. The potential for loss of life due to malfunctions, sensors unable to accurately read the environment, and security vulnerabilities are significant. Coupled with the potential for a public loss of confidence that could prevent mass adoption, prudence dictates that the NHTSA must require all motor vehicles, especially of a type that has yet to be proven safe in the public view, to retain the ability for the driver to take manual control from the automated software.

2. Hazard Avoidance

Where ADS can predict the presence of driving hazards that are dangerous to automated vehicles, the ADS should prohibit the vehicle from traveling through that hazard. The agency should consider the feasibility of requiring ADS vehicles to communicate with a national system that monitors weather reports that will alert the vehicle to weather conditions along its path that would be hazardous. The ADS should prevent the vehicle from traveling through dense fog, unmapped roads, roads that are not suited for ADS because of rough terrain, flooding, or any other conditions that would make travel unsuitable for ADS. As part of its hazard avoidance regulation, the agency should also consider limiting an ADS from planning a trip that exceeds its fuel range. Restricting a vehicle in this way would reduce the risk of collision that occurs when a car is stopped along the side of a road.

3. Emergency Response

All ADS should be required to have technology that enables the car to respond to emergencies. ADS will undoubtedly experience highly random events that are impossible for ADS to avoid, such as a broken windshield, flat tire, mechanical failure, being struck by another car, or being in the path of an emergency response vehicle. In these situations, the ADS should take action to protect the occupants while alerting the driver to take manual control of the vehicle. It is easy to picture a situation where heavy traffic prohibits an ADS from moving out of the way of an emergency response vehicle. As a result of the driver's inability to manually maneuver their vehicle, the emergency response vehicle could be significantly delayed.

IV. Conclusion

The NHTSA is well within its statutory authority under the Highway Safety Act to develop and issue Federal Motor Vehicles Safety Standards for Automated Driving Systems. The agency should follow its traditional approach to vehicle safety and use technology requirements, not performance standards, to ensure consumer safety and encourage mass adoption of Automated Driving Systems. Research shows that Automated Driving Systems are particularly vulnerable to cyber-attack and that the inherent risks present in Automated Driving Systems require the ability for the driver to take manual control of the vehicle. The agency should also consider additional safety features such as hazard avoidance and emergency response when developing Safety Standards.

Sincerely,

Wyatt Burr