

April 1, 2021

The Honorable Steven Cliff  
Acting Administrator  
National Highway Traffic Safety Administration  
U.S. Department of Transportation  
1200 New Jersey Avenue SE  
Washington, DC 20590

**Re: Docket No. NHTSA-2020-0106, “Framework for Automated Driving System Safety”**

Kodiak Robotics, Inc. (Kodiak), a leading developer of Automated Driving Systems (ADSs) for Class 8 semi trucks, is pleased to present this response to the National Highway Traffic Safety Administration’s (NHTSA’s) Advanced Notice of Proposed Rulemaking (ANPRM) on a Framework for Automated Driving System Safety.

Kodiak is thrilled that NHTSA has chosen to focus its attention on developing new frameworks for ADS safety. We applaud NHTSA for its leadership on creating a path for safety regulation for ADSs, one of, if not the most, important new transportation technologies of our time. We also commend NHTSA for its thoughtful approach, as represented by this ANPRM.

This ANPRM represents a subtle but important shift for NHTSA, which has, until this point, focused on the potential applicability of current vehicle safety standards to ADS-equipped vehicles. Developing safety standards for the behavior of ADS-equipped vehicles represents a tremendous challenge and an exciting opportunity. We believe this shift comes at an opportune time: the ADS industry has reached a point of maturity where additional guidance from NHTSA on certain critical issues such as testing procedures and law enforcement interaction would help guide industry research and development and encourage the rapid adoption of these innovative technologies.

ADS-equipped vehicles represent an opportunity to achieve NHTSA’s mission of saving lives, preventing injuries, and reducing economic costs. NHTSA’s own research suggests that 94% of traffic accidents are caused by human error, due to factors such as distraction, impairment, and fatigue. While the potential safety benefits of ADS technology are clear, we also believe that, in the long run, thoughtful regulation will be critical to assuring public acceptance of ADS-equipped vehicles. At the same time, premature or unnecessarily burdensome regulations could prove to be a limit on innovation, needlessly holding back ADS technology.

As a developer of ADS technology purpose-built for long-haul trucks, we also think it critical that NHTSA’s rulemaking process consider the specific requirements of different vehicle types and form factors. As a developer of ADS-equipped long-haul trucks, Kodiak believes that different vehicle types will necessarily have different Operational Design Domains (ODDs), safety requirements, and performance needs. These differences will necessarily impact technology and regulation. As NHTSA works towards developing a regulatory framework for ADS-equipped vehicles, it must consider these differences in vehicle types and requirements.

---



---

Kodiak supports the comments submitted by the industry groups that it belongs to, including the American Trucking Association, the Consumer Technology Association, and the Self-Driving Coalition for Safer Streets. In addition, please see below Kodiak’s answers to a selection of the questions asked in this ANPRM.

### ***Question 1***

Kodiak believes that the right framework for ADS safety must necessarily be flexible enough to manage change as ADS technology develops. Today, rules-based guidance is most appropriate to ensure that ADS developers incorporate safety best practices and ensure that NHTSA builds public confidence in ADS technology. As the technology develops, however, performance standards may become appropriate and necessary. These standards, however, must take into account the specific use cases, requirements, and ODDs of different vehicle types.

### ***Question 6***

Kodiak does not agree that core elements for ADSs described in this ANPRM is complete or entirely accurate. We believe there are at least two more core functions of an ADS:

- Localization, the function of determining where an ADS-equipped vehicle is in the world, and
- Prediction, the function of predicting the behavior of other road actors

At a more general level, we believe that ADS developers may design their systems with different boundaries and interfaces between different components - the distinction between these functions may not be precisely the same from developer to developer. This means there may still be significant research necessary before NHTSA can define these core elements in rules.

### ***Question 11***

In general, both rules-based and statistically-based methodologies are necessary to assess ADS safety performance. Rules-based functional safety processes such as ISO 26262 have long been critical to safety assessment in the automotive industry. They have a long record of success, and have broad applicability to ADS development.

Newer, statistically-based validation tools must also play a significant role in the assessment of ADS safety, particularly as ADS developers aim to demonstrate that their systems are safer than human-driven vehicles. Technologies such as simulation must play a key role in these statistical assessments, for a variety of reasons. First, the critical question for an ADS is how it handles so-called “edge cases”, or unusual, dangerous driving scenarios. For safety reasons, the appropriate way to validate performance in these situations is in simulation, not on the road. Second, as ADS technology is developing rapidly, it is critical to encourage developers to continue making progress: validating a system entirely on-road would require using the same codebase for years,



---

preventing forward progress or even bug fixes. Finally, simulation allows these technologies to be tested in a completely risk-free environment and accumulate statistically significant volumes of data without the need to put vehicles on the road. When combined with real-world testing and validation, simulation allows for the creation of an enormous volume of data on which ADSs can be evaluated.

Submitted by,

Daniel Goff  
Head of Policy

Kodiak Robotics  
1049 Terra Bella Ave  
Mountain View, CA 94043