United States Department of Transportation

National Highway Traffic Safety Administration

Framework for Automated Driving System Safety [Docket No. NHTSA-2020-0106]

49 CFR Part 571

Rulemaking Response from Ohio

V. Questions and Requests

A. Questions About a Safety Framework

• Question 1. Describe your conception of a Federal safety framework for ADS that encompasses the process and engineering measures described in this document and explain your rationale for its design.

The state of Ohio supports NHTSA's approach to ADS to date, which has focused on guidance for ADS developers such as *Automated Driving Systems 2.0: A Vision for Safety.* This has been an appropriate approach due to rapidly developing technology. With public safety of paramount concern, we agree with the framework approach outlined in this NPRM and suggest a combination of guidance and regulation. With guidance, NHTSA can provide signals to the market on how safety will be addressed, thus potentially reducing technology development costs. Regulation, on the other hand, provides the ultimate level of public safety assurance.

• Question 2. In consideration of optimum use of NHTSA's resources, on which aspects of a manufacturer's comprehensive demonstration of the safety of its ADS should the Agency place a priority and focus its monitoring and safety oversight efforts and why?

No response.

• Question 3. How would your conception of such a framework ensure that manufacturers assess and assure each core element of safety effectively?

Guidance needs to be both timely and comprehensive. NHTSA's ADS guidance has been helpful to date, but frequent updates will be necessary to keep pace with rapid technology developments. Renewed guidance should be comprehensive to include future regulatory approaches, which will provide developers with the technical standards and risk management approaches that will be necessary for regulatory approval and widespread market adoption.

• Question 4. How would your framework assist NHTSA in engaging with ADS development in a manner that helps address safety, but without unnecessarily hampering innovation?

It is assumed that regulatory approaches will be performance-based, with appropriate public safety thresholds. Performance-based approaches provide the widest latitude for innovation, while communicating public goals. Communication of regulatory approaches in guidance is important to a frictionless market, as opposed to regulation imposed post-hoc to ADS technology development and rollout.

• Question 5. How could the Agency best assess whether each manufacturer had adequately demonstrated the extent of its ADS' ability to meet each prioritized element of safety?

No response.

• Question 6. Do you agree or disagree with the core elements (i.e., ''sensing,'' ''perception,'' ''planning'' and ''control'') described in this document? Please explain why.

Agree. The core elements seem logical from a systems engineering standpoint, such that safety issues, or failure analysis, can be appropriately traced to one of the four.

• Question 7. Can you suggest any other core element(s) that NHTSA should consider in developing a safety framework for ADS? Please provide the basis of your suggestion.

No.

• Question 8. At this early point in the development of ADS, how should NHTSA determine whether regulation is actually needed versus theoretically desirable? Can it be done effectively at this early stage and would it yield a safety outcome outweighing the associated risk of delaying or distorting paths of technological development in ways that might result in forgone safety benefits and/or increased costs?

We believe that ADS will provide public safety benefits. That said, there will likely be crashes involving ADS-equipped vehicles, and that such crashes will elicit public demand for NHTSA regulations. This hypothetical suggests that since ADS regulation, in some form, is inevitable. If true, it seems both reasonable and beneficial to provide ADS developers with signals as to what a future regulatory regime will entail, and what requirements will be.

In addition, Ohio notes there are current requirements in place for event data recorders in human driven vehicles. Maintaining this standard while increasing the data points as well as the resolution of that data is important for transparency. The ability of the ADS to capture and store data should only increase with the level of automation. Crashes will only be reduced through the use of the ADS vehicles and investigating those crashes to determine causative factors will be more important to prevent future crashes from occurring. This has the added benefit of quickly identifying major safety issues.

The storage and retention of data is going to be important for the vehicle and/or system manufacturer to self-evaluate and making that data available to local agencies will guide NHTSA in rulemaking and evaluation of safety systems.

• Question 9. If NHTSA were to develop standards before an ADS equipped vehicle or an ADS that the Agency could test is widely available, how could NHTSA validate the appropriateness of its standards? How would such a standard impact future ADS development and design? How would such standards be consistent with NHTSA's legal obligations?

Performance-based standards are effective in providing guidance to ADS developers, as opposed to detailed regulations about the technology itself. In addition, NHTSA should consider agile regulatory approaches that can be modified as technology changes and new innovations enter the marketplace.

In addition, Ohio notes the parameters of data reported be the vehicle's event data recorder (EDR) system should be standardized for all ADS equipped vehicles. This would allow local law enforcement the ability to determine the causative factors of a crash and measure driver inputs in situations where control of the vehicle is shared between the driving system and the human operator. As the evolution to full driving capability advances so should the data being captured by the vehicle's EDR. The data would

be significantly more than is currently captured on EDR equipped vehicles but would be critical in determining the effectiveness of the ADS.

NHTSA currently has regulatory authority over vehicle defects and when an ADS is in control during a preventable crash this event would constitute a vehicle defect. Working with local law enforcement agencies to evaluate potential defects is going to be important in identifying potential safety issues. This process is very similar to the manner in which vehicle defects are currently reported, however local law enforcement should have a dedicated manner to identify safety issues that arise in the ADS equipped vehicles.

• Question 10. Which safety standards would be considered the most effective as improving safety and consumer confidence and should therefore be given priority over other possible standards? What about other administrative mechanisms available to NHTSA?

The key parameters being considered should be deaths per million miles, injuries in crashes per million miles and crashes per million miles. All three factors are data points that can be measured currently with human driven vehicles and the data can be compared to boost consumer confidence. The motivation to move to more ADS control in a vehicle should be driven by safety as a top priority. Measuring these key data points by manufacturer will show the public transparency much like the current vehicle safety ratings. ADS calculations and contribution to future crash prevention will depend on future road and intersection designs as they become specifically designed and built to accommodate for both human driven vehicles as well as advancements in ADS.

NHTSA has some influence over state crash reports and should ensure crashes are being reported consistently across the nation. Working with state and local officials to determine a guide to best practices for crash reports, roadway design and intersection design should be an area of focus. Using the technology available in the ADS capable vehicles to generate data about a crash is critical and NHTSA should focus on setting those parameters for the reporting from ADS vehicles.

Using the ADS vehicles to assess contribution of road and weather conditions on crashes would be of benefit for local Department of Transportation section. This could help to provide direction on road treatment and design. Current roadways consider human drivers only and as the technology advanced so must infrastructure.

• Question 11. What rule-based and statistical methodologies are best suited for assessing the extent to which an ADS meets the core functions of ADS safety performance? Please explain the basis for your answers. Rule-based assessment involves the definition of a comprehensive set of rules that define precisely what it means to function safely, and which vehicles can be empirically tested against. Statistical approaches track the performance of vehicles over millions of miles of real-world operation and calculate their probability of safe operation as an extrapolation of their observed frequency of safety violations. If there are other types of methodologies that would be suitable, please identify and discuss them. Please explain the basis for your answers.

No response.

• Question 12. What types and quanta of evidence would be necessary for reliable demonstrations of the level of performance achieved for the core elements of ADS safety performance?

No response.

• Question 13. What types and amount of argumentation would be necessary for reliable and persuasive demonstrations of the level of performance achieved for the core functions of ADS safety performance?

No response.

B. Question About NHTSA Research

• Question 14. What additional research would best support the creation of a safety framework? In what sequence should the additional research be conducted and why? What tools are necessary to perform such research?

Ohio encourages the continuation of NHTSA's AV Test initiative, designed to provide an element of public understanding of ADS technology, as well as feedback to the overall regulatory process.

C. Questions About Administrative Mechanisms

• Question 15. Discuss the administrative mechanisms described in this document in terms of how well they meet the selection criteria in this document.

Both voluntary and regulatory mechanisms should be considered. For voluntary mechanisms, NHTSA should consider guidance that would provide some degree of uniformity in terms of safety metrics, risk assessment, and risk mitigation. Like other NHTSA guidance, voluntary mechanisms provide market signals to developers, potentially reducing their development cost. Ultimately, there is an assumption that ADS will require regulation. We take no position on which regulatory approach to take (Mandatory Reporting, FMVSS Setting, other), but rather suggest that NHTSA establishes its approach as soon as practicable, again to provide market signals to developers, on what regulatory standards they must attain.

• Question 16. Of the administrative mechanisms described in this document, which single mechanism or combination of mechanisms would best enable the Agency to carry out its safety mission, and why? If you believe that any of the mechanisms described in this document should not be considered, please explain why.

No response.

• Question 17. Which mechanisms could be implemented in the near term or are the easiest and quickest to implement, and why?

No response.

• Question 18. Which mechanisms might not be implementable until the mid or long term but might be a logical next step to those mechanisms that could be implemented in the near term, and why?

No response.

• Question 19. What additional mechanisms should be considered, and why?

No response.

• Question 20. What are the pros and cons of incorporating the elements of the framework in new FMVSS or alternative compliance pathways?

No response.

• Question 21. Should NHTSA consider an alternative regulatory path, with a parallel path for compliance verification testing, that could allow for flexible demonstrations of competence with respect to the core functions of ADS safety performance? If so, what are the pros and cons of such alternative regulatory path? What are the pros and cons of an alternative pathway that would allow a vehicle to comply with either applicable FMVSS or with novel demonstrations, or a combination of both, as is appropriate for the vehicle design and its intended operation? Under what authority could such an approach be developed?

No response.

D. Questions About Statutory Authority

• Question 22. Discuss how each element of the framework would interact with NHTSA's rulemaking, enforcement, and other authority under the Vehicle Safety Act.

No response.

• Question 23. Discuss how each element of the framework would interact with Department of Transportation Rules concerning rulemaking, enforcement, and guidance.

No response.

• Question 25. If you believe that any of the administrative mechanisms described in this document falls outside the Agency's existing rulemaking or enforcement authority under the Vehicle Safety Act or Department of Transportation regulations, please explain the reasons for that belief.

No response.

• Question 24. If your comment supports the Agency taking actions that you believe may fall outside its existing rulemaking or enforcement authority, please explain your reasons for that belief and describe what additional authority might be needed.

No response.