QUANTIV RISK

200 Park Avenue
Suite 1700
New York, NY 10017
quantivrisk.com

Michael R. Nelson
C: 212 233 5083 • O: 917 936 4455
mike@quantivrisk.com
quantivrisk.com

April 1, 2021

VIA FEDERAL RULEMAKING PORTAL

Docket Management Facility, M-30
US Department of Transportation
1200 New Jersey Avenue SE
West Building, Ground Floor
Room W12-140
Washington, DC 20590-0001

Attention: United States Department of Transportation, National Highway Traffic Safety Administration, Docket No. DOT-NHTSA-2020-0106

Dear Sir or Madam:

I am the President and founder of Quantiv Risk, Inc., an InsureTech company focused on objective analysis of traffic accidents and other incidents in which advanced automotive technologies are implicated. We work with insurers, OEMs, manufacturers, and consumers to accurately determine the operating dynamics of a vehicle leading up to a collision. Quantiv Risk was created in response to the need to address risk allocation that is impacted by emerging technologies in the mobility sector. Our data scientists, insurance professionals, and litigation experts work with our clients to evaluate and address the myriad changes that are taking place and that will continue to accelerate in the transportation and insurance sectors as a result of the introduction of new automotive technologies, and how these changes impact legal and risk assessment and transfer. Specifically, and of consequence to the issues raised by the Department's present focus, we use Vehicle Performance Data (VPD) (data captured and/or generated by a vehicle by and through advanced technologies) as well as traditional EDR data relating to collisions to analyze the relevant factors pertaining to a collision to enable our clients to better understand risk and liability.

Like many that will respond to the Advance Notice of Proposed Rulemaking (ANPRM), we believe emerging vehicle technology will ultimately make transportation safer and more efficient as it matures. We are concerned, however, that automated vehicles at present are being introduced into the marketplace in a largely unregulated fashion. We are also concerned that some manufacturers are introducing emerging technologies to the public while overstating the functionality and safety of their technologies—to the detriment not just of direct consumers but every driver on the road. These same manufacturers are closely and we believe overzealously maintaining control over very important data generated by automated vehicles that relate to collisions under the guise of guarding the manufacturers' competitive and trade secrets.

Evaluating the relative safety of this technology as it matures should be as transparent as possible while respecting consumer privacy and legitimate proprietary interests. Our position is, following a collision, Vehicle Performance Data captured and/or generated by automated vehicle systems at all levels of autonomy should also be available to all stakeholders. Greater transparency of this data, which will become more ubiquitous over time, will lead to a better understanding of the collision dynamics and ultimately the evolution of a safer roadway environment. Greater transparency will also increase and accelerate consumer confidence in the technology, improve risk allocation, and in turn improve our insurance systems and legal processes. This will result in a more efficient transfer of risk and ultimately lower cost for businesses and consumers.

Response to NHTSA's Advance Notice of Proposed Rule Making

Quantiv Risk has reviewed the National Highway Traffic Safety Administration (NHTSA) ANPRM titled "Framework for Automated Driving System Safety," published at *85 Federal Register* 78058 on December 3, 2020. NHTSA requests comments and input on its role in the development of a framework for automated driving system (ADS) safety and direction on the design of the safety framework, the appropriate means for improving safety, mitigating risk, and enabling development and introduction of safety technology. As a threshold matter, we believe that the scope of the ANPRM should not be confined to ADS alone but should also include regulation of Advanced Driver Assistance Systems (ADAS). By focusing on ADS, to the exclusion of regulation of ADAS, products that are introduced as Level 2 systems will remain largely unregulated. The ANPRM's focus on ADS while seemingly ignoring ADAS appears to be based on the assumption that at some future date the introduction of ADS will render ADAS systems extinct or ADAS will just be the initial phase of emerging mobility technology as we pass through on the way to a higher level of automation. We believe this assumption is mistaken, and that ADAS should also be considered as part of the ANPRM process, because some of the automated technologies in ADAS systems are being used to develop ADS systems today.

We also have reviewed the NTSB's February 1, 2021 response to the ANPRM and largely agree with the positions taken and points made by Chairman Sumwalt in that response. Accordingly, we have adopted with additional comment several of NTSB's conceptual points as reflected in our specific position statements below related to the necessity of (a) enhanced collision avoidance technologies; (b) robust safety and risk management requirements for the testing of automated vehicles on public roads; (c) certain risk mitigation measures; and (d) a proactive rather than reactive approach to enforcement. In addition, we strongly believe, as set forth in our additional position statement below, that NHTSA's policy on Vehicle Performance Data should be clarified to ensure that vehicle owners, operators, and other appropriate stakeholders have clear rights of access to this data.

Collision Avoidance Technology Should Be Made Standard on All New Vehicles

We believe it is imperative that NHTSA establish a minimum set of performance standards for all collision avoidance technologies, a system that should be required as a standard feature on all new vehicles, regardless of whether the vehicle has an ADS. Similar to how a crash-avoidance system would aid in a human-driven vehicle when the driver's performance or attention is flawed, a crash-avoidance system for an ADS vehicle would serve to avoid collisions when the ADS does

not function correctly and does not avoid a crash. Not only would widespread collision avoidance technologies increase the public confidence in new automation technologies as it is introduced, but it would also prevent fatalities while in development and testing, especially on public roads. This seems particularly critical as manufacturers are "beta testing" new technologies, we believe, without adequate safety backup.

Robust Safety and Risk Management Requirements Should Be Put in Place for the Testing of AVs On All Public Roads

Based on Section II of the ANPRM, NHTSA seems to be under the impression that before prototype ADSs are tested on public roads, they always undergo a rigorous testing and safety analysis by the manufacturer to address potential risks. As NTSB notes in its response, in the second iteration of its AV policy, AV 2.0, NHTSA encouraged manufacturers to perform a self-administered safety report containing 12 safety-relevant elements (system safety, design domain, object event detection and response, fallback, validation methods, human-machine interface, vehicle cybersecurity, crashworthiness, post-crash ADS behavior, data recording, consumer education and training, and federal/state/local laws). While these 12 elements would serve to avoid collisions and ensure the safety of drivers, the safety report is only encouraged by NHTSA and is not a mandatory submission for evaluating capability. NHTSA comments that these 12 elements are strictly relevant to ADS, and even more specifically, Level 4 systems and above. However, several of these elements should be used to avoid collisions in vehicles with lower levels of automation as well.

A large factor in the success and safety of ADS is public confidence and acceptance of the new systems. AV 2.0 offered recommendations to stakeholders on the testing and deployment of ADS-equipped vehicles, introducing the concept of a Voluntary Safety Self-Assessment (VSSA), which encourages developers to show the public that they are keeping safety at the front of all aspects of ADS and communicating with the DOT about the transparency and confidence of testing ADS-equipped vehicles. As of March 2021, 26 companies have published VSSAs. This number continues to increase. However, there are major automakers, including Tesla, who have not disclosed VSSAs.[1] Additionally, VSSAs are only for ADSs, and do not include lower levels of automation, notably those with very high functioning ADAS.

NHTSA offers several mechanisms in Section IV of the ANPRM that would encourage developers and manufacturers to focus on the safety and transparency of ADS development, many of which have already been NHTSA's approach to development so far. NHTSA believes that setting this framework would place ADS safety performance at the forefront of ADS development, and developers would be competing for the safest system, while also allowing for necessary research and testing. NHTSA's proposals should not be self-voluntary guidance and should be supported by federal regulation.

[1] https://www.nhtsa.gov/automated-driving-systems/voluntary-safety-self-assessment

Risk Mitigation Measures

The Human Factor: Monitoring and Maintaining Driver Engagement

Human misuse and misunderstanding of ADS and ADAS systems also pose a safety risk. Safety of The Intended Functionality (SOTIF) is a safety standard NHTSA discusses in Section III of the ANPRM.[2] The standard attempts to prevent insufficiencies of the intended functions of the ADS, specifically as it relates to human misuse and human/machine interaction. As ADS systems become more advanced and are deployed, situations will likely arise where it becomes necessary for control of the vehicle to be handed over to the operator to avoid a crash. Realistic considerations of the human operator as the safety fallback should be taken into consideration.

Currently, there is no minimum standard for an alert or monitoring system in lower-level automation systems that can ensure driver engagement in an emergency maneuvering situation. In ADS-equipped vehicles, driver/operator awareness and engagement is necessary to the safety of its deployment. In several partially automated vehicle crashes that the NTSB has investigated, it found that the driver was disengaged and not properly monitoring the driving environment of the vehicle.[3] It is critically important for SAE Level 2 automation systems and Level 3 ADSs to implement technology that requires the operator of the vehicle to stay engaged and be reasonably able to take control of the vehicle when necessary, taking all human factors into consideration. NHTSA's publication *Human Factors Evaluation of Level 2 and Level 3 Automated Driving Concepts* reflects the significant amount of time humans need to regain control in the face of an unexpected event.[4]

Some manufacturers warn drivers that they are required to monitor the vehicle's performance and execute a take over response when conditions require. In our experience some operators do not understand when the vehicle is not performing properly, are not adequately warned by the vehicle that they should assume control, and do not have the capacity to simultaneously diagnose an ADS or ADAS shortcoming while also reacting to a roadway hazard. We also suggest that NHTSA consider that guidance to consumers that they, as operators of Level 2 vehicles, are the fallback safety control. We suggest NHTSA evaluate if this requirement (disclaimer) may in fact provide false assurances to human operators that they can properly perform take over responses as needed when in fact they cannot do so from a human factors perspective.

---

[2] As noted earlier, the ANPRM does not address ADAS systems. We believe it should and the concerns raised here regarding ADS also relate to ADAS systems.

[3] See NTSB February 1, 2021 letter to NHTSA.

[4] Participants took a mean of 1.2 seconds to regain control of a vehicle equipped with a Level 2 system and 2.1 seconds to regain control of a vehicle equipped with a Level 3 system. Participant performance with automation changed over time in certain aspects in that participants took longer to respond to their prompts as their time in the study progressed over a 3-hour session, between 2.4 and 3.0 seconds for Level 2. https://www.nhtsa.gov/sites/nhtsa.dot.gov/files/812182_humanfactorseval-l2l3- automdrivingconcepts.pdf Research Question 1, page 8.

Humans generally do not perform well at monitoring the vehicle and its environment. Drivers/operators tend to become complacent after long periods of vehicle-controlled operation and are not able to properly respond when necessary. Effective driver monitoring systems must be an integral component and must be able to effectively determine the level of driver awareness. A minimum standard must be in place that requires the existence of alerts (visual, auditory, and/or haptic) to ensure that the driver is remaining engaged.[5]

AVs must give the driver/operator an alert to remain engaged with the operation of the vehicle and allow enough time for the driver to respond in a situation that would require intervention. NHTSA should include a driver alert or monitoring system in the development of the AV safety framework. Especially as ADS continues to develop, operator monitoring is crucial when testing on public roads.

The Machine Factor: Operational Design Domain

ADAS and ADS-equipped vehicles should properly operate in their intended ODD, performing accurate object and event detection, and respond accordingly. Object and event detection functions are expected to detect any obstacle or other vehicle or event that would cause potential risk to safe operation, address a variety of situations that would require emergency maneuvering, and accurately plan a course of action to avoid crash, collision, or injury.

Research and tests already conducted on Level 2 driving systems can be applied to all levels of automation to determine whether the vehicle is in its appropriate environment. Level 2 systems incorporate safeguards that limit the use of assisted-driving systems in conditions outside of that which they were designed. NHTSA has failed to create a method to address these safeguards and does not have plans currently to develop a method. For instance, Tesla argues that ODD limits are not applicable to its Autopilot platform because operators of Level 2 driver assist systems make that determination. Delegating that responsibility to the consumer, some of whom may be operating a parent's vehicle or who may not appreciate the limitations of the technology, seems to be an over-delegation of responsibility.

Despite several fatal collisions, NHTSA continues to fail to recognize the significance of ensuring that there are safeguards in place that would prevent ADAS and ADS-equipped vehicles from operating outside what their systems are designed for. Without regulations put in place by NHTSA about the development of automated control systems, manufacturers are able to test these vehicles anywhere. Tesla markets and sells its products as having Full Self-Driving Capabilities and has taken the position that its FSD platform is introduced to drivers as a "Beta".[6] There must be proper policy in place to minimize the risks in all levels of automation, especially as the development and deployment of more advanced systems continues.

---

[5] Ibid.

[6] Tesla markets some of its technology as "Full Self-Driving Capability". It notes on its website some of its features as "Beta", for instance: "**Navigate on Autopilot (Beta)**: Actively guides your car from a highway's on-ramp to off-ramp, including suggesting lane changes, navigating interchanges, automatically engaging the turn signal, and taking the correct exit." https://www.tesla.com/support/autopilot.

NHTSA's Enforcement Strategy Must Be Proactive

NHTSA's enforcement strategy is to identify safety-related errors in design and performance in ADS-equipped vehicles as they occur rather than through actual regulation. This approach does not proactively attempt to provide proper oversight on safety, but rather reacts to situations after they have already occurred. Under NHTSA's current strategy, it only evaluates the technology that has caused crashes or injuries, allowing unreasonable risk to occur on public roads before evaluation.

The guidance encourages manufacturers to take the necessary steps to ensure that any new automated safety technology can account for misuse, such as when an operator of the vehicle deliberately and knowingly chooses not to act in accordance with the intent and design of the automated aspect of the vehicle. As the NTSB has recommended in their letter to NHTSA, to determine what would be considered an "unreasonable risk," NHTSA should require a forward-looking risk analysis to protect individuals from injury before they occur, rather than a reactive approach to defective vehicles after the injuries they have occurred.[7]

NHTSA's Policy on Vehicle Performance Data Should Be Clarified to Ensure That Vehicle Owners, Operators, and Other Appropriate Stakeholders Have Clear Access Rights to This Data

In 2019, NHTSA withdrew a 2012 NPRM that proposed a Federal Motor Vehicle Safety Standard (FMVSS) that would require an event data recorder (EDR) to be installed on most light vehicles, because it was determined that more than 99 percent of light vehicles being sold already were equipped with EDRs and given the near-universal installations of the EDRs, NHTSA believed that a regulation requiring this installation would be expending limited agency resources. However, the EDR requirements that were established by NHTSA in 2012 mandated that the systems meet 49 *Code of Federal Regulations* Part 563, which limited the standard to only 15 required data elements being reported by the EDR systems. The EDR data that is recorded is only for a very short time frame (usually the most recent 5 seconds prior to the event), and EDR data is only recorded when there is a significant event. By law, EDR data belongs to the owner or lessee of a vehicle.[8] Data from vehicles' EDRs retrieved through recent investigations in AV crashes does not show the status of AV activation, engagement, or object detection and classification.[9]

In addition to the limited data that is recorded in the EDR, ADAS-equipped vehicles generate and/or capture data relating to the operation of the vehicle that is relevant to an accident.[10] This data is sometimes referred to as Vehicle Performance Data or ADAS data. VPD is not recorded in a vehicle's EDR but is recorded in the systems integral to the ADAS system, such as

[7] See NTSB February 1, 2021 letter to NHTSA.

[8] Driver Privacy Act of 2015. Some states have enacted similar legislation, e.g., 18 DE Code § 3918 (2019).

[9] See NTSB February 1, 2021 letter to NHTSA.

[10] https://www.plm.automation.siemens.com/global/en/products/simulation-test/adas-data-collection.html

the ADAS electronic control units (ADAS ECUs).[11] In order to obtain VPD data, there must be coordination with the manufacturer or operator.[12] Some manufacturers refuse to provide the data unless the request for the data is associated with a subpoena. In short, accessing VPD is difficult as it is not readily available from the vehicles and there is no commercial tool available to be able to retrieve the data regarding AV's functionality.[13]

Development and deployment of automation systems in vehicles is only going to increase, and it will increasingly be necessary to access information about VPD following crashes. VPD is necessary to understand system malfunctions resulting in a crash, or near-crash, and how operators were driving the vehicle and using AV technology. A federal regulation for vehicles equipped with an ADAS system that captures information regarding the vehicle's control before and during a crash is necessary to understand vehicle and driver performance following an accident.

NHTSA also needs to create a framework that focuses on standardized data elements, recording, and access to safety event data. Transparency of VPD would allow for increased safety of automated vehicle technology and greater understanding of performance of the ADAS and ADS features. It would also create greater transparency of system performance for all stakeholders and eliminate hoarding of data that arguably belongs to vehicle owners and operators, similar to how EDR data is regarded. It would also create an objective means to compare data vehicle to vehicle, manufacturer to manufacturer.

[11] https://www.tomtom.com/blog/adas/adas-ecu/

[12] See NTSB February 1, 2021 letter to NHTSA.

[13] Ibid.