



## Regulatory Comment

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*Comments submitted to the National Highway Traffic Safety Administration in the Matter of:*

# REMOVING REGULATORY BARRIERS FOR VEHICLES WITH AUTOMATED DRIVING SYSTEMS

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The Niskanen Center is a 501(c)3 issue advocacy organization that works to change public policy through direct engagement in the policymaking process.

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# INTRODUCTION

In response to the National Highway Traffic Safety Administration’s (NHTSA) request for comment on *Removing Regulatory Barriers for Vehicles with Automated Driving Systems*,<sup>1</sup> the Niskanen Center is pleased to submit the following response in order to help “identify any regulatory barriers in the existing Federal Motor Vehicle Safety Standards (FMVSS) to the testing, compliance certification and compliance verification of motor vehicles with Automated Driving Systems (ADSs) and certain unconventional interior designs.”<sup>2</sup> This is a vital next step towards ensuring the safe, effective, and expeditious deployment of autonomous vehicles on American roadways—technology that holds the potential to save tens of thousands of lives annually.<sup>3</sup>

Specific and actionable updates to ensure FMVSSs accelerate, rather than retard, the rollout of autonomous vehicles are long overdue. As we noted in recent comments to the Department of Transportation (hereafter, “the Department”) regarding its *Automated Vehicle Policy Summit*:

The updated guidance on automated vehicles should include specific recommendations for federal motor vehicle safety standards that need to be amended or rescinded to accommodate the introduction of autonomous vehicles on American roadways. Providing this level of statutory clarity is an important and necessary next step in developing the rules of the road that will help, rather than hinder, the research, testing, and eventual deployment of this life-saving technology.<sup>4</sup>

We believe this request for comment (RFC) can help inform the next draft of the Department’s Federal Automated Vehicle Policy guidance—most recently laid out in *A Vision for Safety*<sup>5</sup>—and look forward to working with the Department, NHTSA, and other stakeholders to begin clearing the road for the future of autonomous transportation in America.

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<sup>1</sup> *Removing Regulatory Barriers for Vehicles with Automated Driving Systems*, National Highway Traffic Safety Administration, Docket No. NHTSA-2018-0009, 83 FR 2607, published Jan. 1, 2018, <https://www.federalregister.gov/documents/2018/01/18/2018-00671/removing-regulatory-barriers-for-vehicles-with-automated-driving-systems>.

<sup>2</sup> *Ibid.*

<sup>3</sup> Adam Thierer and Ryan Hagemann, *Removing Roadblocks to Intelligent Vehicles and Driverless Cars*, Wake Forest Journal of Law & Policy, Vol. 5:2, 2015, pp. 339-391, [https://wfulawpolicyjournal.com.files.wordpress.com/2016/05/5-thierer-hagemann\\_final.pdf](https://wfulawpolicyjournal.com.files.wordpress.com/2016/05/5-thierer-hagemann_final.pdf).

<sup>4</sup> Ryan Hagemann, *Comments submitted to the Department of Transportation in the Matter of: Automated Vehicle Policy Summit*, Niskanen Center, Docket No. DOT-OST-2018-0017, submitted Mar. 5, 2018, p. 5-6, <https://niskanencenter.org/wp-content/uploads/2018/03/Comment-Automated-Vehicle-Policy-Summit-DOT.pdf>. (hereafter, *Automated Vehicle Policy Summit*)

<sup>5</sup> *Automated Driving Systems 2.0: A Vision for Safety*, U.S. Department of Transportation, National Highway Traffic Safety Administration, Sep. 2017, [https://www.nhtsa.gov/sites/nhtsa.dot.gov/files/documents/13069a-ads2.0\\_090617\\_v9a\\_tag.pdf](https://www.nhtsa.gov/sites/nhtsa.dot.gov/files/documents/13069a-ads2.0_090617_v9a_tag.pdf). (hereafter, *A Vision for Safety*)

# PART I: UPDATING AUTOMOTIVE SAFETY REGULATIONS

The Department will need to update various terms as currently defined in 49 C.F.R. § 571, either because they (1) do not apply to autonomous vehicles for reasons related directly to the technology, or (2) fail to adequately account for the transformative nature of the technology and its impact on vehicular design considerations. The following is a partial inventory of the many FMVSSs in the *Code of Federal Regulations* that NHTSA should consider revising in light of these issues. While this list is not necessarily an exhaustive accounting of the many federal regulations that require revision, we offer it here as a starting point for consideration.

## 49 C.F.R. §571.3 (Subpart A)

First and foremost, and perhaps most obviously, the definition of a vehicle “operator” or “driver” needs to be updated to reflect non-human operations in an autonomous vehicle. As currently defined, “[d]river means the occupant of a motor vehicle seated immediately behind the steering control system.” This definition will need to be adjusted to account for the “driver” of any such vehicle not being a human operator at all, and therefore functionally incapable of being “seated immediately behind the steering control system.” Settling on a clear technical definition of, for example, an artificial intelligence, neural network, or machine-learning algorithm capable of safely and effectively operating a motor vehicle is no small task. Nonetheless, this definition will undoubtedly be a cornerstone of any future regulatory regime governing this technology’s deployment, and will likely be the deciding factor in whether and how autonomous vehicles can be successfully integrated on American roadways.

The definitions under 49 C.F.R. § 571.3 will also certainly require reexamining how a “seating reference point (SgRP)” is defined. NHTSA should consult with the Society of Automotive Engineers in pursuing updates to these recommended practices.<sup>6</sup>

## 49 C.F.R. §571.101 (Subpart B)

While the “location, identification, color and illumination of motor vehicle controls, telltales and indicators” may be unaffected by autonomous vehicles, the purpose of this FMVSS is “to facilitate the proper selection of controls under daylight and nighttime conditions, in order to reduce the safety hazards **caused by the diversion of the driver’s attention from the driving task.**” (emphasis added) Since the “driving task” of an

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<sup>6</sup> Currently, the SgRP “[e]stablishes the rearmost normal design driving or riding position of each designated seating position, which includes consideration of all modes of adjustment, horizontal, vertical, and tilt, in a vehicle.” Given the ability of autonomous technology to permit innovative new vehicular designs for seating positions, as well as additional “modes of adjustment” for individual seats, this current provision could be potentially stifling for automotive designers. 49 C.F.R. § 571.3.

autonomous vehicle would no longer be the province of a human operator, and given that the “diversion” from such tasks is in fact one of the fundamental benefits associated with a driverless vehicle, we suggest 49 C.F.R. § 571.101 be updated to reflect the potential redundancy of many of the “controls and displays” provisions contained therein.

### **49 C.F.R. §571.111 (Subpart B)**

The FMVSS requiring various motor vehicles provide “rear visibility” accounts solely for the construction and placement of mirrors present on a given automobile. By outlining specific measurements for “field of view,” as well as the “driver’s” seat adjustment, the rule fails to account for the use of radar, cameras, LIDAR, and other emerging technologies that increasingly supplant the use of reflective mirrors as a means of “reduc[ing] the number of deaths and injuries that occur when the driver of a motor vehicle does not have a clear and reasonably unobstructed view to the rear.” For an autonomous vehicle, provisions mandating the installation of such mirrors is superfluous in light of the advanced sense-and-avoid navigation technologies incorporated into their design.

### **49 C.F.R. §571.124 (Subpart B)**

The scope of the rule governing a vehicle’s accelerator control system is broadly constructed to include “requirements for the return of a vehicle’s throttle to the idle position **when the driver removes the actuating force from the accelerator control.**” (emphasis added) While the provisions of this FMVSS could be read to assume the inclusion of autonomous systems, we would note that reference to the physical act of a (presumably) human operator removing “force from the accelerator control” could create confusion. Further, the definition of such systems solely accounts for a “driver-operated accelerator control system,” defined as any vehicle component regulating engine speed “in direct response to movement of the driver-operated control.” Clarification for the scope of this rule’s applicability to autonomous vehicle operations may be necessary.

### **49 C.F.R. §571.135 (Subpart B)**

Although this FMVSS contains various provisions referencing the “driver” in a manner that does not recognize the possibility of a non-human operator, one in particular stands out as meriting an explicit mention. Under S5.3.1, it is stipulated that “[t]he service brakes **shall be activated by means of a foot control.** The control of the parking brake shall be independent of the service brake control, and **may be either a hand or foot control.**” (emphasis added) Once again, this language reflects the presumed need for traditional foot

or hand brakes at the driver’s control, which may or may not be necessary in the design and construction of future autonomous vehicles.<sup>7</sup>

Subsequent provisions also make reference to the “friction surface of the brake,” “pedal force” (which S7.2.3.(c)(1) partially defines as being “applied and controlled by the vehicle driver or by a mechanical brake pedal actuator”), and other language that suggests the existence of a physical breaking device. These will likely warrant updates.

### **49 C.F.R. §571.207 (Subpart B)**

This section is emblematic of a theme common in other FMVSSs, in which explicit reference is made to a “driver’s seat.” Under S4.1, for example, the FMVSS mandates that “[e]ach vehicle shall have an occupant seat for the driver.” While such a stipulation may make perfect sense for human-operated vehicles, it becomes somewhat farcical to mandate a seat specifically for an artificial intelligence, neural network, or other software-based algorithmic system, which possesses no corporeal form.

Additionally, the performance standards under sub-sections S4.2 and S4.3.2 addressing the specific Newtonian force thresholds to be permitted based on whether a seat is “forward-facing” or in a “rearmost position” may need to be recalculated given innovative new vehicle designs.<sup>8</sup> Similar reconsiderations may also be necessary for the research and testing purposes under subsection S5.

While the provisions under this FMVSS are undoubtedly necessary to ensuring the safety of occupants in a motor vehicle, careful deliberation should be applied in assessing how the unique nature of autonomous vehicles might offer innovative vehicle designs that could better promote passenger safety.

### **49 C.F.R. §571.208 (Subpart B)**

Requirements for occupant crash protection under 49 C.F.R. § 571.208 also necessitate an adjustment in language referencing the “driver” seat versus “passenger” seats. In particular, any FMVSS stipulating the placement of crash dummies for safety testing purposes will need to account for the lack of specific “driver”

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<sup>7</sup> In some circumstances it may be desirable, or necessary, to include a means by which the human occupant can reliably bring the vehicle to a halt. However, such a capability may not necessarily involve a physical, mechanical braking lever, and may be accomplished through a computer interface, voice control, or other means.

<sup>8</sup> For example, some manufacturers are considering autonomous vehicle designs with seating positions that face the interior of the vehicle, and may encounter regulatory difficulties in determinations of “forward-facing” and “rearmost” positioning; Brett Berk, *Prepare Yourself for the Sweet, Sweet Luxury of Riding in a Robocar*, Wired, May 21, 2017, <https://www.wired.com/2017/05/prepare-sweet-sweet-luxury-riding-robocar/>.

and “passenger” seats. Similarly, requirements that use seating arrangements as the basis for directing the placement of warning labels for airbags will require adjustments.<sup>9</sup>

## PART II: POLICY RECOMMENDATIONS

The language currently employed in these rules is emblematic of a larger problem associated with attempts to regulate emerging technologies: an excessive reliance on static and prescriptive rules that have accumulated over long periods of time and fail to adequately account for the transformative nature of new innovations.

As but one example enumerated *supra*, the use of “rear-facing” or “forward-facing” for seating positions poses potential problems for the development of new vehicle design with internal-facing seats or seats that permit a full 360 degree swivel rotation. Currently, under 49 C.F.R. § 571.3, there is no formal definition of “rear-facing” or “forward-facing.”<sup>10</sup> This is certainly understandable, as a common reading and understanding of such directionality would be premised on the assumption that such seating in a human-operated vehicle would be referenced by the direction the vehicle is traveling; which, in turn, is naturally coupled to the direction the human driver is facing. In a vehicle with no human driver as a reference point for directionality, however, many current FMVSSs—in particular, 49 C.F.R. § 571.207, 49 C.F.R. § 571.208, and 49 C.F.R. § 571.213—fail to adequately account for adjustments and improvements to the current automotive design paradigm.

Updating the hundreds of pages of FMVSS rules will be no small task. However, as a starting point for conversation, we offer the following recommendations that can be built upon in future NPRMs, RFCs, or other agency actions.

### I. Embrace an Approach of “Clarity Through Simplicity” in Considering FMVSS Updates

Given the volume of FMVSSs and the difficulty of determining their varying applicability to autonomous vehicles, NHTSA and the Department may wish to consider an approach that embraces “clarity through simplicity.” For example, one potential solution to the inconsistencies littered throughout the corpus of

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<sup>9</sup> For example, under 49 C.F.R. § 571.208 S4.5.1(b), air bag warning labels are required to “have a label permanently affixed to either side of the sun visor at the manufacturer’s option, at each front outboard seating position that is equipped with an inflatable restraint.” An autonomous vehicle with inward-facing seats, however, may not include (or even necessitate) a “sun visor.” A “front outboard seating position” may similarly be absent.

<sup>10</sup> We would note, however, that under 49 C.F.R. § 571.213, a “rear-facing child restraint system” is defined as “a child restraint system, except a car bed, that positions a child **to face in the direction opposite to the normal direction of travel of the motor vehicle.**” (emphasis added) This appears to be the only formal definition of “rear-facing” included throughout 49 C.F.R. § 571, but reads as narrowly applying only to a “child restraint system” and not vehicular seating positions and arrangements more broadly.

FMVSSs may be to simply provide an update to the definition of basic terms such as “driver seat” and “forward-facing” that apply specifically to autonomous vehicles. This would have the benefit of preserving the baseline standards applicable to traditional human-operated vehicles, while carving out particularized exemptions for driverless cars. Alternatively, NHTSA and the Department could consider exempting autonomous vehicles from specific FMVSSs they determine to be inapplicable to ADSs.

A full accounting of the FMVSSs that employ language potentially stifling to the deployment of autonomous vehicles is difficult, given the sheer number of regulations and the scope of their potential applicability. Additionally, there is likely a similarly broad corpus of guidance documents and sub-regulatory (“soft law”) actions that may be implicated in the interpretation of various FMVSSs housed in the *Code of Federal Regulations*. As such, fully addressing the potential barriers facing autonomous vehicle testing and deployment will necessarily require a thorough audit of NHTSA’s past soft law practices, actions, and documented deliverables.<sup>11</sup> In addition to those FMVSSs specifically discussed previously, the following sections of the *Code of Federal Regulations* will need to be re-examined, either in whole or in part, to accommodate the deployment and safety testing of autonomous vehicles: 49 C.F.R. § 571.10, 49 C.F.R. § 571.205(a), 49 C.F.R. § 571.210, 49 C.F.R. § 571.211, and 49 C.F.R. § 571.212.

Because of the critical importance of defining the autonomous vehicle “operator” or “driver,” we would recommend NHTSA pay particularly close attention to updating that portion (49 C.F.R. § 571.3) of the *Code of Federal Regulations*. We might also recommend, given the outsize impact such a change will have on the fundamental character of domestic transportation networks, that NHTSA or the Department consider a separate request for comment on that matter alone. A formal, multistakeholder process housed at the National Telecommunications and Information Administration may also be worth serious consideration, given that agency’s strong history of convening and leading such proceedings.

## 2. Suspend the DSRC Mandate Rulemaking

In addition to the above recommendations, we wish to reiterate our ongoing opposition to NHTSA’s notice of proposed rulemaking (NPRM) that would establish a new FMVSS mandating the use of the Dedicated Short Range Communications (DSRC) standard for vehicle-to-vehicle (V2V) communications.<sup>12</sup> As we remarked in prior comments to the agency:

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<sup>11</sup> For a more thorough accounting of what may constitute such soft law practices and sub-regulatory actions in the context of autonomous vehicles, see Ryan Hagemann, Jennifer Skees, and Adam Thierer, *Soft Law for Hard Problems: The Governance of Emerging Technologies in an Uncertain Future*, Colorado Technology Law Journal, 2018 (forthcoming), [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=3118539](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3118539).

<sup>12</sup> Niskanen Center to Secretary Elaine L. Chao and Chairman Ajit Pai, *RE: Federal Motor Vehicle Safety Standards: Vehicle-to-Vehicle (V2V) Communications Docket No. NHTSA-2016-0126, Revision of Part 15 of the Commission’s Rules to Permit Unlicensed National Information Infrastructure (U-NII) Devices in the 5 GHz Band, ET Docket No. 13-49*, June 12, 2017, <https://niskanencenter.org/wp-content/uploads/2017/09/LetterDSRCMandateFCCandNHTSA-3.pdf>.

While we applaud the focus on technology-neutral rules and market-driven solutions, the Department has yet to make a final decision on its rules that would mandate [DSRC] standards for all new light vehicles—including autonomous vehicles. This issue is a perfect example of a *technology-specific* mandate that is unlikely to deliver on its purported benefits, and which could easily be discarded without negatively impacting ongoing developments in safety-critical technologies for connected cars and autonomous vehicles.<sup>13</sup>

Mandating a one-size-fits-all V2V standard is inadvisable for numerous reasons, including the potential for incentivizing technological lock-in, misallocation of valuable spectrum, and the failure to consider less costly and more efficient alternatives. But the problems with DSRC don't end there. The NPRM also fails to account for how NHTSA intends to offset the costs of this mandate, pursuant to Executive Order 13771.<sup>14</sup>

Finally, and perhaps most concerning, the technical limitations and failings of DSRC are unlikely to deliver on its promises of increasing public safety or enhancing the cybersecurity of America's light vehicle fleet. In a March 2017 report examining the shortcomings of DSRC, cybersecurity expert Alex Kreilein concluded:

Empirical security research already shows the general lack of security in vehicles. DSRC, as presently conceived, would make matters worse. It presents a new attack surface with special considerations, given its integration into critical control systems.<sup>15</sup>

Even the Department's own analysis of a pilot program intended to weigh the costs and benefits of deploying DSRC contained numerous criticisms, despite the report's ultimately optimistic conclusion.<sup>16</sup> As we noted in our original comments to NHTSA on the DSRC mandate:

In its 2015 report on the Safety Pilot Program, the Department concluded that its program was, overall, "a major success" and recommended moving forward with recommendations requiring V2V communications standards for light vehicles. However, if one reads through the report carefully, it is difficult to ascertain how the Department reached such a conclusion. It cites numerous cost overruns, timeline delays, and technical failures throughout the rudimentary pilot deployment of the technology. For a report that purports to assess the readiness of DSRC-equipped connected vehicle safety applications for national

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<sup>13</sup> *Automated Vehicle Policy Summit*, p. 5.

<sup>14</sup> Competitive Enterprise Institute, American Commitment, Niskanen Center, Reason Foundation, and R Street Institute to Secretary Elaine Chao, Apr. 3, 2017, <https://cei.org/sites/default/files/Letter%20to%20USDOT%20on%20V2V%20April032017.pdf>.

<sup>15</sup> Alex Kreilein, *Security Considerations for Connected Vehicles and Dedicated Short Range Communications*, SecureSet report, Mar. 2017, p. 14, <http://glenechogroup.isebox.net/securesetaccelerator/dedicated-short-range-communications-dsrc-expose-critical-gaps-in-security-and-privacy>.

<sup>16</sup> *Safety Pilot Model Deployment: Lessons Learned and Recommendations for Future Connected Vehicle Activities*, FHWA-JPO-16-363, Sep. 2015, <https://rosap.ntl.bts.gov/view/dot/4361>.



deployment, the ultimate conclusion appears to be at odds with the evidence of what actually transpired.<sup>17</sup>

The Department deserves praise for its commitment to evaluating existing FMVSSs and the potential barriers they pose to realizing the benefits of autonomous vehicles. However, the DSRC mandate may end up being a far more significant hurdle for this budding technology than any existing FMVSS. Accordingly, given the Department's focus on considering regulatory changes to help accommodate the safe deployment of autonomous vehicle technology, we would be remiss if we failed to reiterate the substantial shortcomings of this NPRM. As such, we would recommend that the Department formally suspend the current rulemaking providing for DSRC to be the mandatory V2V standard for all future light vehicles.

## CONCLUSION

We would like to applaud NHTSA and the Department of Transportation for taking this important and undeniably necessary first step in reevaluating existing regulatory barriers that could pose a problem for the deployment of autonomous vehicles. This is a potentially life-saving technology that holds the promise of making American streets safer, to say nothing of the potential economic gains. In the spirit of this request for comment, the task now before NHTSA and other stakeholders is to continue working through detailed and specific updates to the *Code of Federal Regulations*, embracing “clarity through simplicity” as a means of addressing the many complexities inherent in this undertaking. Autonomous vehicles are no longer the purview of science fiction; their advent is rapidly approaching. The sooner we can begin clearing the roadblocks to their deployment, the sooner all Americans can benefit from safer streets.

We would like to thank NHTSA for the opportunity to comment on this issue and look forward to continued engagement on this and other topics.

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<sup>17</sup> Ryan Hagemann, *Comments to the National Highway Traffic Safety Administration in the Matter of: Proposed Rules Mandating Vehicle-to-Vehicle Communications Technology for Light Vehicles*, NHTSA Docket No. NHTSA-2016-0126, submitted April 12, 2017, p. 3, [https://niskanencenter.org/wp-content/uploads/2017/04/NiskanenCenter\\_CommentsV2VCommunicationsNHTSA.pdf](https://niskanencenter.org/wp-content/uploads/2017/04/NiskanenCenter_CommentsV2VCommunicationsNHTSA.pdf).