ADVOCATES
FOR HIGHWAY
& AUTO SAFETY

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Ford Motor Company – Receipt of Petition for Temporary Exemption
From Various Requirements of the Federal Motor Vehicle Safety Standards
for an Automated Driving System-Equipped Vehicle
Notice of Receipt of Petition for Temporary Exemption; Request for Public Comment
87 Federal Register 43602, July 21, 2022

Advocates for Highway and Auto Safety (Advocates) files these comments in response to the National Highway Traffic Safety Administration's (NHTSA, Agency) Notice of Receipt of Petition for Temporary Exemption from Ford Motor Company (Ford) for exemptions from various requirements of the Federal Motor Vehicle Safety Standards (FMVSS).[1]

Ford submitted this petition pursuant to Code of Federal Regulations Chapter 49 section 555 (49 CFR 555), seeking the exemption on the basis that it would otherwise be prohibited from selling a vehicle whose overall level of safety or impact protection is at least equal to that of a non-exempted vehicle.[2] Advocates opposes the petition which would enable further expansion of the operation on public roads of vehicles equipped with unproven automated driving systems (ADS). Any evidence of an equivalent level of safety as it relates to a certain federal safety standard is not the same as demonstrating that granting the exemption and thus, enabling the expanded operation of ADSs would be in the public interest and consistent with the objectives of United States Code Title 49 Chapter 301 (49 USC 301) "to reduce traffic accidents and deaths and injuries resulting from traffic accidents."

Consistency With the Safety Act

The statutory requirements for exemptions are unambiguous in that the Secretary of Transportation must find that the exemption would be "consistent with the public interest and this chapter [49 USC 301]."[3] The stated purpose of the chapter being "to reduce traffic accidents and deaths and injuries resulting from traffic accidents."[4] The stated purpose of the application for exemption is "to further develop, evaluate, and deploy its Society of Automotive Engineers

[1] 87 FR 43602 (Jul. 21, 2022), (Notice).
[2] Ford Motor Company – Petition for Exemption, NHTSA-2022-0066-0001 (Petition).
[3] 49 USC 30113(b)(3)(a).
[4] 49 USC 30101.

(SAE) Level 4 Automated Driving System (ADS) feature equipped vehicle."[5] However, the petition contains no data or documentation demonstrating that the ADS system will actually reduce traffic crashes, injuries or deaths. While the petition notes that the exemption will "enable controlled deployment and usage of the ADS-equipped vehicles on tested, proven roadways during appropriate weather conditions"[6] and that "self-driving vehicles have the potential to create safer streets for everyone,"[7] there is no evidence of what testing has been conducted, its results, or how and when any safety "potential" would be realized. The petition mentions "specific milestones"[8] but provides no clarification on what those milestones are, how they were developed, or any other specifics. Ford further justifies the petition by indicating that it "believes having active driving controls and communications would introduce an unacceptable risk to safety"[9] but again provides no evidence of the safety of the ADS compared to a human driver in control of a non-exempt vehicle. As such, the petition fails to meet the statutory requirements for an exemption which mandates that the Secretary make a finding that "an exemption is consistent with the public interest and this chapter [301]," and thus, should be denied.

Concerns By Individual FMVSS

FMVSS 101: Controls and Displays

FMVSS 101 "specifies performance requirements for location, identification, color, and illumination of motor vehicle controls, telltales, and indicators."[10] The purpose of the standard "is to ensure the accessibility, visibility and recognition of motor vehicle controls, telltales and indicators, and 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, and by mistakes in selecting controls."[11] Ford proposes that when the subject vehicles are operated manually, by a human driver, that "all required controls, telltales and indicators will operate as required by regulation."[12] However, in AV mode, the petition indicates that when operated by the ADS, "a few select telltales, indicators, and controls will be presented to occupants."[13] Ford further notes that the "ADS does not need the location, identification, illumination, or color prescribed within FMVSS 101 when the ADS is performing the driving task, so the majority will not be provided to the occupants."[14] This argument ignores the critical information a number of these telltales provide to the occupants and focuses solely on the usefulness to the driver. For example, Ford notes that occupants will not need the brake system malfunction, antilock brake system malfunction, electronic stability control malfunction, transmission control position, low tire pressure, or tire pressure monitoring system malfunction

[5] Petition, p. 1.
[6] Petition, p. 2 and 8.
[7] Petition, p. 5.
[8] Petition, p. 6.
[9] Petition, p. 25.
[10] 49 CFR 571.101(1).
[11] 49 CFR 571.101(2).
[12] Petition, p. 10.
[13] Petition, p. 11.
[14] Petition, p. 11.

telltales because "the ADS receives feedback on the status via the vehicle communication network."[15] Ford provides no support for the underlying claim that such information would not be important to a consumer entering one of their vehicles and deciding on whether to use that vehicle. In addition, absent in the discussion of a number of these telltales, is a description of how the ADS will respond to the conditions which would trigger those telltales and ensure the safety of the passengers. In other cases, for indicators such as turn signals and transmission control position, Ford provides no data that passengers would not want, let alone require for safety reasons, this information. For example, occupants may need to know which direction the ADS is intending on moving or may benefit from knowing that the vehicle transmission is in 'park' prior to entering or exiting the vehicle. Ford has provided no evidence that there is not a safety need to passengers to have many, if not all, telltales provided to the occupants of the vehicle instead of solely having the corresponding data transmitted to the ADS. Additionally, no descriptions have been provided as to what the ADS response will be to many of the conditions which trigger the telltale and what thresholds are deemed unsafe in terms of those situations. Ford also notes, the telltales, lighting, and associated other components will be in the vehicle for when the vehicle is operated manually, indicating that there would likely be minimal cost (if any) to enabling the telltales when the vehicle is operated in AV mode.

FMVSS 102: Transmission Shift Position Sequence; Starter Interlock, and Transmission Braking Effect

Ford seeks an exemption from the requirements for FMVSS 102, specifically section 3.1.4, identification of shift positions and shift position sequence. Ford notes that the vehicle will comply with the regulations when in manual mode (human driven) but will not display such information in the vehicle when it is being driven by the ADS. Ford focuses only on the needs of the driver / ADS and ignores the potential safety implications of not providing such information to the occupants. Occupants may want or need to know which direction the vehicle intends to move (forward or backward) in the absence of a human driver or the shifting of a transmission level providing feedback as to the intended motion of the vehicle. Likewise, consumers will want to know that the vehicle transmission is in park prior to entering or exiting the vehicle.

FMVSS 108: Lamps, Reflective Devices, and Associated Equipment

FMVSS 108 "specifies requirements for original and replacement lamps, reflective devices, and associated equipment,"[16] the purpose of which "is to reduce traffic accidents and deaths and injuries resulting from traffic accidents, by providing adequate illumination of the roadway, and by enhancing the conspicuity of motor vehicles on the public roads so that their presence is perceived and their signals understood."[17] The lack of testing or evidence provided in the application to support claims that the ADS will be able to control the vehicle lighting appropriately is deeply concerning. The failure of such a system could not only impair the ADS's ability to operate the vehicle but also could result in a danger to human operators of other vehicles facing excessive glare, or a situation where a lack of lighting could leave other road

[15] Petition, p. 11.
[16] 49 CFR 571.108(1).
[17] 49 CFR 571.108 (1-2).

users unable to see the vehicle in dark conditions. Equally troubling is Ford's request for an exemption from the requirements relating to the hazard warning signal, indicator and control. Passengers would benefit from the knowledge that the vehicle is experiencing conditions which call for the use of the hazard warning lights. Moreover, passengers would want the ability to control or command the hazard lights to alert others outside of the vehicle if the ADS is operating in an unsafe manner. Ford ignores these issues by simply claiming that the "appropriate actions will be taken"[18] or that the ADS can "react immediately"[19] without providing details on how thoroughly they have evaluated the ability of the ADS to execute these responses, let alone to perform them appropriately during the driving task.

FMVSS 111: Rear Visibility

FMVSS 111 "specifies requirements for rear visibility devices and systems,"[20] the purpose of which is "to reduce 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."[21] The petition focuses on how the ADS will not "visually perceive the image,"[22] how the "ADS will not be distracted by the rearview 'image,'"[23] and how the various sensors "provide multiple modalities through which the vehicle can detect the environment around the vehicle during operation at all times."[24] However, nothing in Ford's petition describes how an equivalent level of safety will be achieved if the exemption is granted. According to 49 USC 30111(a), "each [motor vehicle] safety standard must be practicable, meet the need for motor vehicle safety, and be stated in objective terms."[25] In the case of rear visibility, the "need for motor vehicle safety"[26] is "to reduce the number of deaths and injuries"[27] which is only achieved when the driver has both "a clear and reasonably unobstructed view"[28] and the driver acts upon that information and stops the vehicle before striking someone causing a death or injury. In fact, the cost benefit analysis of FMVSS 111 was dependent on an estimate of the effectiveness of rearview visibility systems considering the ability of average drivers to see and respond to objects observed in the rear visibility systems.[29] In fact, in the final regulatory impact analysis for the final rule, the executive summary discusses "System Effectiveness"[30] in which it clearly states that "three conditions must be met for a [rearview visibility system] technology to successfully provide a benefit to the driver,"[31] the third of which is that "the driver must both perceive this information

[18] Petition, p. 18.
[19] Petition, p. 18.
[20] 49 CFR 571.111(1).
[21] 49 CFR 571.111(2).
[22] Petition, p. 19.
[23] Petition, p. 19.
[24] Petition, p. 19.
[25] 49 USC 30111(a).
[26] 49 USC 30111(a).
[27] 49 CFR 571.111(2).
[28] 49 CFR 571.111(2).
[29] Final Regulatory Impact Analysis – Backover Crash Avoidance Technologies FMVSS No. 111. NHTSA-2010-0162-0255. (FMVSS 111 FRIA).
[30] FMVSS 111 FRIA, p. ii.
[31] FMVSS 111 FRIA, p. ii.

and ***respond appropriately before impact with the pedestrian*** [emphasis added]."[32] Ford has failed to address or provide any evidence that the ADS will be able to perceive, let alone respond accordingly to objects detected behind the vehicle. Thus, the petition has failed to demonstrate that an exempted vehicle will meet the safety need addressed by the FMVSS and will achieve an equivalent level of safety to that of a non-exempted vehicle.

FMVSS 126: Electronic Stability Control Systems for Light Vehicles

The purpose of FMVSS 126 "is to reduce the number of deaths and injuries that result from crashes in which the driver loses directional control of the vehicle, including those resulting in rollover."[33] The petition focuses on how the ADS when operating the vehicle would not respond to a telltale, but would respond to communication about the telltale, namely that there are conditions indicating a malfunction with the electronic stability control (ESC) system. However, once again, Ford fails to discuss whether passengers would want to know before or during a trip, whether the ADS driven vehicle was experiencing an ESC malfunction. Moreover, there is no discussion of what actions the ADS will take when such a malfunction is communicated.

FMVSS 135: Light Vehicle Brake Systems

The stated purpose of FMVSS 135 "is to ensure safe braking performance under normal and emergency driving conditions."[34] The petition focuses on how the ADS will control the vehicle braking and not on the needs of the occupants. As noted in several other sections for other FMVSS, occupants will want the brake malfunction indicator to be enabled when the vehicle is in AV mode to allow them to decide whether to start or continue the trip. While the petition notes that the ADS would be made aware of any brake malfunction, there is no discussion what action will be taken to ensure the safety of the occupants, or even whether the vehicle will stop operating until the malfunction is resolved. As noted earlier, the performance of the brakes matters when the operator observes and reacts to a dangerous situation on the road.

FMVSS 138: Tire Pressure Monitoring System

The purpose of FMVSS 128 is "to warn drivers of significant under-inflation of tires and the resulting safety problems."[35] The petition focuses on how the ADS will be provided the information triggering the tire pressure monitoring system (TPMS) telltale. Unlike other sections of the petition, Ford does provide limited details on actions to be taken by the ADS in response to the telltale triggering conditions or a TPMS malfunction. However, once again, the petition fails to acknowledge the safety benefit provided to passengers when they are alerted to low tire pressure or TPMS malfunction that would inform their choice to take or continue a ride in the vehicle. The safety benefit of alerting individuals in the vehicle to concerns with tire pressure or the TPMS system do not disappear simply because none of those occupants are a driver. Consumers must be given appropriate and necessary information to make informed

[32] FMVSS 111 FRIA, p. ii., emphasis added
[33] 49 CFR 571.126(2).
[34] 49 CFR 571.135(2).
[35] 49 CFR 571.138(1).

choices. This is particularly important when there is no human driver and there is a lack of evidence or specificity as to what constitutes a determination by the ADS that there is a "significant degradation of lateral control" which would trigger a response from the ADS.[36]

Substantiation that Compliance Would Prevent the Sale of the Vehicle

Ford has filed the application for exemption under 49 CFR 555(d) the basis of which is "that the applicant is otherwise unable to sell a vehicle whose overall level of safety or impact protection is at least equal to that of a nonexempted vehicle."[37] However, the petition claims that "given human occupants are not intended to participate in the driving task during AV mode, Ford ***believes*** [emphasis added] having active driving controls and communications would introduce an unacceptable risk to safety."[38] The petition provides no data or evidence to substantiate this assertion. Ford's claim is particularly unreasonable when considering this is justification for eliminating communication in the form of telltales and warnings to alert passengers to malfunctions or less than ideal operating conditions in the vehicle which would normally be transmitted to a driver. Without any demonstrative evidence beyond "belief" of how "having active driving controls and communications would introduce an unacceptable risk to safety," there is no justification for approving this petition. Similarly, the petition fails to include evidence that granting this petition and thus allowing introduction of an ADS with an unproven and undocumented safety performance would not present an unacceptable risk to safety.

Plans for Further Action at the End of the Exemption

Ford states in the petition that it "will work with stakeholders across the industry on rulemaking efforts during the exemption period, with the intention of supporting NHTSA's updates to FMVSS and/or development of new regulations for governing ADS operation."[39] This statement should have no bearing on the decision by the Agency when considering the safety risks posed by the exemption. Research on the safe performance of ADS driven vehicles should be conducted on private rights of way or under close oversight with controls to limit exposing members of the public to unnecessary risks.

Public Interest Considerations

Advocates concurs with the NHTSA's assertion that "the broad authority to determine whether the public interest and general goals of the Safety Act will be served by granting the exemption allows the agency to consider many diverse effects of the exemption, including: the overall safety of the transportation system beyond the analysis required in the safety determination; how an exemption will further technological innovation; economic impacts; and environmental effects."[40] Ford notes in their petition that "the AV will monitor the seatbelt status of each seat and notify/warn occupants via the HMI [human machine interface] when their seatbelt is

[36] Petition, p. 24.
[37] 49 CFR 555.6(d).
[38] Petition, p. 25.
[39] Petition, p. 25.
[40] Notice at 43607.

unbuckled" but provides no discussion of the importance of ensuring that every occupant is properly seated and restrained. All states with the exception of New Hampshire require front-seat occupants to use seat belts, and adult rear-seat passengers are covered by laws in 32 states and the District of Columbia.[41] The safety benefits of seatbelts and proper restraints are undeniable and have been repeatedly quantified by the NHTSA.[42] There is no reason that the Agency should accept, especially in the context of a petition for exemption, that an ADS driven vehicle should ever move unless all occupants are accounted for and properly restrained. The first line of defense in protecting the lives of occupants are seat belts and thus, NHTSA should not waiver on this requirement. It is inconceivable, with billions of dollars invested in the development of these ADS, to allow the continued preventable loss of lives from lack of restraint use.

Accessibility and Equity

Advocates supports the NHTSA's consideration of accessibility and equity as part of the evaluation of whether an exemption is in the public interest and in setting conditions for granting an exemption. However, the NHTSA should not limit their consideration of these issues to collecting information after the granting of an exemption. The petition claims that accessibility and equity will be improved and as such, Ford should be required to provide documentation demonstrating how their systems will achieve these goals.

The petition fails to detail what Americans with Disabilities Act (ADA) requirements would apply to these vehicles. The NHSTA should not wait until after granting the exemption to find out how many, or rather how few if any, of the vehicles would be wheelchair accessible. This information should have been included in the exemption application. The NHTSA should also consider what unique challenges the operation of these new vehicles (without a human driver or human attendants) could pose to all individuals. Accessibility concerns go beyond the physical access to the vehicle and include but are not limited to interacting with the ADS and controls, entering destinations, securing wheelchairs, using restraints, and being able to respond to emergency situations. Operational aspects also will be important as decisions such as pickup and drop off locations at the curb, in the street, in the vicinity of an accessible curb, will all impact the achievement of accessibility. Likewise, the impact of introducing new mobility services could have on the availability of existing accessible services should also be considered. The petition fails to include a description of a means by which occupants would be provided with an accessible way to request an emergency stop in the case of a failure of the ADS. The NHTSA should examine all of these issues while considering the petition and request petitioners provide details on how accessibility will be achieved as well as goals and milestones to ensure that potential benefits claimed will actually be realized in a timely manner.

The NHTSA should also require petitioners to provide a plan and milestones for achieving equity. As ADS systems will be limited in their operational design domains (ODDs) for the foreseeable future, manufacturers should be able to clearly define how and where their vehicles

[41] Insurance Institute for Highway Safety (IIHS) Seatbelts, available at https://www.iihs.org/topics/seat-belts#laws.
[42] Traffic Safety Facts, 2019 Data: Occupant Protection, NHTSA, Sep 2021, DOT HS 813 176.

will be operating and identify how the communities encompassing those ODDs will be impacted in order help achieve the equitable goals espoused. Accessibility and equity should be an integral part of the introduction of these vehicles and a required topic to be addressed during the petition and evaluation process.

Congestion / Environmental Impacts

The NHTSA should require petitioners to provide a detailed analysis illustrating how the granting of the exemption and introduction of ADS driven vehicles will result in less congestion and benefit the environment. The NHTSA should reserve the right to terminate any exemption and require all subject vehicles be removed from the road if compliance with the requirements or meaningful progress towards the proposed benefits is not achieved.

Statement of Terms

Advocates supports the addition of terms to any grant of exemption to ensure that petitioners are required to provide the necessary information to the Agency which will inform future rulemaking, ensure safety, and enable evaluation of the purported benefits of the exemptions. These reporting requirements should continue for the useful life of all subject vehicles. NHTSA should retain the ability to require the vehicles to be removed from the road should the petitioner fail to comply with any reporting requirements or the Agency identifies any safety concerns or determines that the continued operation of the exempted vehicles is not in the public interest.

The Agency must require the reporting of safety related data including timely crash reporting, periodic updates, cybersecurity events and other essential information. Advocates concurs that data collected should include, but not be limited to, data from the event data recorder (EDR) and should include all pertinent information from the ADS as determined by NHTSA. Events including crashes, non-compliance with state and local traffic laws, near-incidents or incidents meeting certain dynamic thresholds such as sustained acceleration, interactions with public safety officials such as law enforcement, or instances requiring a fallback to minimal risk conditions would all be of interest to the NHTSA and should be required to be reported. The NHTSA should require reporting of data related to the public interest aspects of the exemption as well, including any data necessary for evaluating accessibility, equity, environmental impacts, or others. The Agency should also require all necessary additional operational data from which to evaluate all aspects of the exemption particularly for public interest and safety. As much as possible, data collected should be made public to allow further evaluation and study of the safety and societal implications of these exemptions.

Modification of the ODD without NHTSA oversight would be inappropriate for a vehicle operating under an exemption. The altering of the ODD would constitute the need for a reevaluation by the Agency and the public to ensure the continued use of the exemption remains in the public interest as the ODD has implications for both the safety of the vehicles and to the achievement of the goals forming the basis for the exemption.

Advocates supports the requirements relating to cybersecurity including immediate cessation of operations, timely reporting, and coordination with the NHTSA prior to resuming operations. In addition, petitioner must be required to have the ability to issue a "stop order" ceasing all operations of subject vehicles in a safe manner in response to a determination that the vehicles present an unreasonable or unforeseen risk to safety. Petitioner must also be required to coordinate with State and local authorities and communicate effectively with the public in the localities where the exempted vehicles will be operating.

The NHTSA should require that any exempted vehicles be readily and individually identifiable. Moreover, NHTSA must establish a simple and accessible means by which the public can notify the Agency of any safety concerns regarding the operation of the exempted vehicles. Petitioners should be required to maintain data on the operation of the exempted vehicles for a period of time sufficient to allow the agency and the public to identify operations of concern and allow the NHTSA to request to review the data from the operation in question.

The NHTSA should establish data reporting requirements to evaluate all claims advanced by the petitioners or by the Agency to conclude that the exemption would be in the public interest. As noted earlier, the NHTSA should establish requirements for reporting and planned goals with respect to the claims of public interest as part of the petition process. Lastly, the Agency should require reporting of data to support evaluation of all claims and conclusions for the life of the vehicles exempted under the petition, if granted.

Conclusion

Advocates supports many of the NHTSA's proposals to establish reporting and operational terms for the granting of an exemption from the FMVSS. As noted above, the Agency must require that petitoners provide detailed plans and milestones for achieveing any claimed benefits to allow the NHTSA and the public to properly evaluate such appplications. Ford has failed to meet the statuory requirements for the granting of an exemption. Therefore, the petition should be denied.

Sincerely,

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