

U.S. Department of Transportation
Docket Operations M-30, Room W12-140
1200 New Jersey Avenue SE
Washington, DC 20590

August 22, 2022

Re: Docket No. NHTSA-2022-0067

To whom it may concern:

Thank you for the opportunity to provide comments on General Motors' Petition for Temporary Exemption from Various Requirements of the Federal Motor Vehicle Safety Standards for an Automated Driving System-Equipped Vehicle.

[NUMO](#), the New Urban Mobility alliance, is a global organization that channels tech-based disruptions in urban transport to create joyful cities where sustainable and just mobility is the new normal. Founded in 2019 as an outgrowth of the [Shared Mobility Principles for Livable Cities](#), NUMO convenes diverse allies and leverages the momentum of significant revolutions in mobility to target urban issues — including equity, sustainability, accessibility and labor — impacted by the shifting transportation landscape. NUMO is hosted by [WRI Ross Center for Sustainable Cities](#).

As requested by NHTSA, please see comments from NUMO below the relevant question in purple.

Please comment on whether NHTSA should apply the following terms and conditions to a potential grant of GM's exemption request:

1. 1. Reporting within 24 hours of an exempt vehicle being involved in any crash, to include: ^[20]
 - a. The data elements specified in [49 CFR part 563](#), Event Data Recorders.^[21]
 - b. If the ADS was in control of the vehicle during the event, a detailed timeline of the 30 seconds leading up to the crash, including a detailed read-out and interpretation of all sensors in operation during that time period, the ADS's object detection and classification output, and the vehicle actions taken (*i.e.*, commands for braking, throttle, steering, etc.).
 - c. If a human operator took over control of the vehicle prior to the event, a detailed timeline of the 30 seconds leading up to the human operator taking over control, including a detailed read-out and interpretation of all ADS sensors in operation during that time period, the ADS's object detection and classification output, and the vehicle actions taken (*i.e.*, commands for braking, throttle, steering, etc.).
 - d. If a human operator was in control of the vehicle at any point during or up to 30 seconds before the event, a detailed timeline of any actions the human operator

- took that affected the crash event, as well as any technical problems that could have contributed to the crash (signal latency, poor field of view, etc.).
- e. Any additional information about the event that NHTSA deems pertinent for determining either crash or injury causation, including additional information related to the ADS or remote operator system.
2. Beginning 90 days after the date of the exemption grant, and at an interval of every 90 days thereafter, a report detailing the operation of each exempted vehicle in operation during that time period. This report may provide this information either in aggregate or on a per-vehicle basis, but it must include the following:
 - a. A calculation of the total miles the vehicle has traveled using the ADS during the report period, and heat maps of the geofenced area in which the vehicle operates to illustrate travel density.
 - b. Detailed descriptions of any material changes made to the subject vehicle's Operational Design Domain (ODD) or ADS software during the reporting period.
 - c. Detailed descriptions of any incidents in which any exempted vehicle violated any local or State traffic law, whether operating using the ADS or under human control.
 - d. Detailed descriptions of any incidents in which the exempt vehicles experienced a sustained acceleration of at least 0.7g on any axis for at least 150 ms, or of any incidents in which the vehicle had an unexpected interaction with humans or other objects (other than crashes that require immediate reporting).
 - e. Detailed descriptions of all instances in which a public safety official, including law enforcement, attempted to interact with an exempted vehicle, such as to pull it over, or contacted GM regarding an attempted interaction with an exempted vehicle.
 - f. Detailed descriptions of any "minimal risk condition fallback" events that occurred, even if no crash has occurred. If the event has occurred because the vehicle self-diagnosed a malfunction of a vehicle system, the report must include a detailed description of the cause and nature of the malfunction, and what remedial steps were taken. If the event was caused by the vehicle encountering a complex or unexpected driving situation, the report must include a detailed timeline of the ADS's decision-making process that led to the event, including any difficulties the ADS had in detecting and classifying objects.
 - g. In addition, GM must make necessary staff available to meet with NHTSA staff quarterly to discuss the status of its deployment program.
 3. GM must have a documented cybersecurity incident response plan that includes its risk mitigation strategies and the incident notification requirements listed below.
 - a. GM must cease operations of all exempt vehicles immediately upon becoming aware of any cybersecurity incident involving the exempt vehicles and any systems connected to the exempt vehicles that has the potential to impact the safety of the exempt vehicles.

- b. No later than 24 hours after being made aware of a cybersecurity incident, GM must inform NHTSA's Office of Defects Investigations (ODI) of the incident. GM must also respond to any additional requests for information from NHTSA on the cybersecurity incident.
 - c. Prior to resuming its operation of any exempt vehicles following the discovery of a cybersecurity incident, GM must inform NHTSA of the steps it has taken to patch the vulnerability and mitigate the risks associated with the incident, and receive NHTSA approval to resume operation.
4. GM must be capable of issuing a “stop order” that causes all deployed exempted vehicles to, as quickly as possible, cease operations in a safe manner, in the event that NHTSA or GM determines that the exempted vehicles present an unreasonable or unforeseen risk to safety.
5. GM must coordinate any planned deployment of the exempted vehicles or change to the ADS/ODD with State and local authorities with jurisdiction over the operation of the vehicle as required by the laws or regulations of that jurisdiction.
6. The exempted vehicles must comply with all State and local laws and requirements at all times while in operation. Each vehicle must be duly permitted, if applicable, and authorized to operate within all properties and upon all roadways traversed.
7. GM must maintain ownership and operational control over the exempted vehicle that are built pursuant to this exemption for the life of those vehicles.
8. GM must create and maintain a hotline or other method of communication for the public and GM employees to directly communicate feedback or potential safety concerns about the exempted vehicles to the company.
9. If there are other categories of data that should be considered, please identify them and the purposes for which they would be useful to the agency in carrying out its responsibilities under the Safety Act.

Regarding requests for data (questions 9-11), we would recommend that NHTSA consider and adhere to the [Privacy Principles for Mobility Data](#) which NUMO developed together with other partners. In general, NHTSA should request the absolute minimum possible data, with a clear and specific use case in mind, store the individual event data for the least amount of time possible, and make a definite time period after which such decisions will be reevaluated.

10. If the agency were to require the reporting of data, for what period should the agency require it to be reported—the two-year exemption period or the vehicles' entire normal service life?
11. Given estimates that vehicles with ADS would generate terabytes of data per vehicle per day, how should the need for data be appropriately balanced with the burden on manufacturers of providing and maintaining it and the ability of the agency to absorb and use it effectively?

12. As explained in the section above, NHTSA has broad authority to determine whether the public interest and general goals of the Safety Act will be served by granting an exemption. NHTSA seeks to understand the 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; whether the exemption will address transportation accessibility and equity; economic impacts, such as consumer benefits; and environmental effects.
13. With regard to environmental impacts, how should NHTSA use the part 555 exemptions to learn about the interplay between fuel efficiency and ADS technologies? Should the agency adopt reporting requirements that would allow the agency to better understand the energy use of the vehicles throughout their service life and possibly better assess, and quantify, the environmental impacts of ADS-equipped vehicles? Should NHTSA require an entity whose petition has been granted to provide data about, for example, how often and how far its vehicles are driving around unoccupied v. occupied?

Understanding vehicle occupancy rates (time of day, distance/trips with precisely how many passengers) is important. It would be useful to know how occupancy rates and deadhead distances compare with other shared transportation (taxis, shuttles, buses) as well as with personal cars. That said, the comparison with personal cars is tricky since we often drive children, the elderly, our spouses to/from a trip and the return is effectively a deadhead. Or, we run low value errands or simply “cruise” and these are all considered of value. That said, there are real concerns about the likely expansion of zero occupancy use of AVs, particularly with respect to delivery. In an AV, without the expense/time of a driver, all zero occupancy distances now come at a very low marginal cost. From a safety perspective, additional VMT always increases the potential for crashes and injury: if not initiated by the AV itself, other vehicles and humans now have the potential to hit it.

14. Is there other information related to the environmental consequences and effects of the vehicles covered by the petition that NHTSA should require from entities granted an exemption?
15. How should NHTSA consider accessibility in applying appropriate conditions to an exemption if it were granted?

It makes sense to break apart this word “accessibility.”

Is the destination one that is geographically inaccessible without a car – a car-dependent-location – and so people without drivers licenses would now have access? I.e. the person is blind, physically disabled, under the age of 16 or too old to drive safely, temporarily lost their license? AVs can help solve the problem of access for those who don’t have/can’t get a driver’s license. Today such people are driven by others: parents, adult children, friends, paid taxi/shuttle/transit drivers. From a safety

perspective, it might be interesting to understand if/how/which of these subgroups require the services of an attendant that has nothing to do with the actual driving activity. In other words, drivers today multitask in ways in which an AV won't or can't. What are those ways?

Another type of inaccessibility is economic. A person might have a driver's license but can't afford a car or fuel and thus the location is economically inaccessible. While one assumes that an on-demand AV might be faster or more convenient than alternatives to car ownership or public transit or other modes, but in what ways will an AV be cheaper? If it isn't cheaper than the alternatives, then it will not improve accessibility for those who can't afford it. And from a safety standpoint, there may not immediately be an impact.

As NHTSA considers outstanding AV safety questions and early stage exemptions, it might consider where on the list of priorities it places accessibility. What issues need to be resolved now before the next phase of AV development? We don't know the answer to this question. From the government's perspective, it could be any of the following.

- Road safety and risks to the most vulnerable road users: cyclists, pedestrians, scooters, three-wheelers
- Public acceptance (precisely which demographics)
- Pickup/drop off safety and space (and for which demographics of riders?)
- Potential for increasing negative externalities related to all vehicles (size and occupancy, emissions, economic burden, etc.) and with special emphasis on those likely to be exacerbated by AVs (congestion, curb use and priority)
- Potential to increase physical access for those who can't drive
- Potential to increase economic access for those who can't afford a car

From a manufacturer's perspective, their biggest unknowns are likely to be:

- Business model viability (at which price points? In which geographies? For what kind of trips?)
- Understanding and expectation-setting with respect to government regulations and oversight.

At our current phase in AV development, the potential for AVs to dramatically increase existing negative externalities associated with vehicle use, and the private sector's building of new businesses on these existing and free negative externalities are a primary concern. Once those issues are understood and solved, providing encouragement and incentives for this new vehicle type to increase access to disadvantaged groups would be the second order of business.

16. As noted above, many proponents of ADS technology often claim that ADS-equipped vehicles could help advance greater transportation accessibility for persons with

disabilities. Should NHTSA impose conditions on grants of part 555 exemptions to learn more about specific actions that manufacturers and operators of ADS-equipped exempted vehicles are planning, or have taken, to further the attainment of accessibility and equity goals? Should NHTSA seek information from manufacturers granted an exemption as to how they ensure that their ride-hailing services comply with any applicable Americans with Disabilities Act (ADA) requirements, how many vehicles would be wheelchair accessible, how they reach people with disabilities to offer access to ride sharing services, or whether the exempt vehicles provide other accommodations for individuals with disabilities, such as communication and/or human-machine interface (HMI) features designed for individuals with sensory disabilities (such as sight or hearing) or cognitive disabilities? Should NHTSA require grantees to report on efforts, such as research or community outreach, that the manufacturer is planning, or has taken, to increase the likelihood that accessibility goals will be met? Comments are requested on whether there is other information related to accessibility that NHTSA should require from an entity when granting its petition.

17. How should NHTSA consider equity in applying appropriate conditions to an exemption if it were granted? For example, should NHTSA require entities receiving a grant of their petition to report how the exempted vehicles will be used to improve accessibility and equity in serving underserved communities? Should such an entity be required to provide plans about how it intends to ensure that access to its services is equitable in terms of neighborhood, income levels, race and ethnicity, age (etc.), and/or provide reports of how it achieved those objectives through use of the exempted vehicles? Should entities receiving a petition grant be required to report on barriers they encountered to deploying ADS-equipped vehicles in underserved communities and how those barriers could be overcome? Should such an entity be required to provide demographic data about its services, or report on efforts, such as research or community outreach, that the manufacturer is planning or has taken to ensure better that equity goals will be met? Comments are requested on whether there is other information related to equity that NHTSA should require when granting a petition.
18. How should NHTSA consider economic impacts when applying appropriate conditions to an exemption if it were granted?

Thank you for the opportunity to comment.

Sincerely,



Harriet Tregoning , Director
New Urban Mobility alliance (NUMO)