DOT Docket Management Facility
U.S. Department of Transportation
1200 New Jersey Avenue, SE
West Building, Ground Floor, Rm. W12-140
Washington, DC 20590-0001

SUBJECT: 49CFR 571.208 Occupant Crash Protection Notice of Proposed Rulemaking (NPRM)

REFERENCE: DOT Docket NHTSA–2019-0093, RIN 2127–AL37

Comments on the Proposed Regulatory Text

Vayyar is a manufacturer of a volumetric sensor which can be used to detect humans within a vehicle. It uses a novel mmWave low-power radar array to build a 3D picture of occupants and to accurately place them in relation to the vehicle interior features, classify if adult vs. infant, and distinguish between objects and humans. It is a very accurate technology which can detect a sleeping infant inside a car seat and under a canopy or a small child within the footwell of a vehicle. This capability can be provided to car makers and their suppliers at a modest cost which is less than that of existing seat belt reminder technology.

A. Potential Specifications for a Required Rear Belt Warning System

1. Triggering conditions.

Warnings and seat belt use: Vayyar's position that the triggering condition for the system should be vehicle unlocking and for a period following relocking. As the system can accurately detect any human in any seat or location (like in between seats) the warning can be set to only situations in which a human, and not an object, occupies the seats – even if lying across the rear bench, or seating in between seats, and the vehicle is in motion – at first TBD seconds after initial driving, or if a significant change in passengers' posture (falling asleep cross the bench)

2. Non audio-visual warning systems.

Non audio-visual warnings: Vayyar's position is that the current warnings work well for front seats and should be extended to the rear seats. Extending the warnings to cover a child left in the vehicle is a simple extension and other types of telecommunication warnings should also be considered.

3. Occupant detection technology.

Occupant detection and false positives: Vayyar's mmWave radar system is tuned to detect humans, all other materials are not seen by the sensor. Vayyar's technology is very simple and cost effective to implement and is very accurate. It can also be used in large open vehicles like buses with multiple sensors.

It will alert in case of humans, even if in out-of-position, as slouching, lying across the bench, seating in between seats - which are not covered today - on top of when seated properly and not buckled.

It will prevent the false alarms in case of heavy bags/other objects, which takes unnecessary focus from the driver today.

4. Seat occupancy criteria.

Rear seat occupancy criteria: Vayyar's technology can accurately detect all human occupants. Linked to seat belt use and/or car seat latch sensors it is easily possible to ensure that all occupants are restrained, and make sure they are seated in right location, which will also help with optimal airbag deployment

5. Resistance to intentional/inadvertent defeat.

Circumvention of the system. Vayyar's technology is able to detect all human occupants and their seating positions in real time. If the technology is linked to seat belt latch indicators it will not be possible to circumvent the system.

6. Warning location.

Who should receive the warning signal: Vayyar's position is that the audible signal should be loud enough to be heard by all occupants.

7. What type of information should the warning convey?

Visual Positive or Negative information: Vayyar notes that the audio warning has been shown in Europe to be a very effective driver of seat belt use, and in that respect the visual information is less important.

In detail, alert on cases where passengers are:

- seated in proper seat and not buckled

- seated in between seats even if buckled/not

- lying across the bench even if buckled or not

B. Applicability

Which vehicles should have occupancy detectors – As Vayyar's technology is simple and cost effective to implement all vehicles should have it. One sensor can cover 1st and 2nd rows.

E. Technological and Economic Feasibility

Cost and difficulty of implementation – Vayyar's technology is available now and is entering serial production in new models in 2021. It comprises one roof mounted sensor in most passenger vehicles (5 seats/2 rows), and 2 or more for vehicles with more rows of seats. Cost analysis by OEMs has shown that the implementation of one Vayyar sensor costs is equivalent to current seat pad type sensors for front row only, and ***significantly lower cost than 2 rows systems.***

In summary the technology now exists – Vayyar's mmWave array 3D Radar technology - to implement rear seat occupant detection in new vehicles at no cost to OEMs.

This ANPRM also has the opportunity to also deal with the difficult 'child left in a hot car' problem through the mandating a requirement that a child in a covered car seat can be detected and parents/carers and others warned.

Vayyar technology can provide a inexpensive and reliable solution for both of these 2 items – Seat Belt Reminders and Child Left Behind in both rows, with a high-end, reliable and robust, yet low-priced, single-sensor per vehicle.

Yours Sincerely,

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