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**DEPARTMENT OF TRANSPORTATION**

**National Highway Traffic Safety Administration**

**49 CFR Part 571**

**[Docket No. NHTSA-2019-0093]**

**RIN 2127-AL37**

**Federal Motor Vehicle Safety Standards;**

**Occupant Crash Protection**

**AGENCY:** National Highway Traffic Safety Administration (NHTSA), Department of Transportation (DOT).

**ACTION:** Advance notice of proposed rulemaking (ANPRM).

**SUMMARY:** The Moving Ahead for Progress in the 21st Century Act of 2012 directs NHTSA to initiate a rulemaking proceeding to amend Federal Motor Vehicle Safety Standard No. 208, "Occupant crash protection," to require a seat belt use warning system for rear seats. NHTSA initiated a rulemaking proceeding in 2013, and as it continues with this proceeding NHTSA is seeking public comment on a variety of issues related to a requirement for a rear seat belt warning system. NHTSA seeks comment on, among other things, potential requirements for such systems, the vehicles to which they should apply, their effectiveness, the likely consumer acceptance, and the associated costs and benefits.

**DATES:** You should submit your comments early enough to be received not later than [INSERT DATE 60 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

**ADDRESSES:** You may submit comments to the docket number identified in the heading of this document by any of the following methods:

- Federal eRulemaking Portal: Go to <http://www.regulations.gov>. Follow the online instructions for submitting comments.
- Mail: Docket Management Facility: U.S. Department of Transportation, 1200 New Jersey Avenue S.E., West Building Ground Floor, Room W12-140, Washington, D.C. 20590-0001
- Hand Delivery or Courier: 1200 New Jersey Avenue S.E., West Building Ground Floor, Room W12-140, between 9 a.m. and 5 p.m. ET, Monday through Friday, except Federal holidays.
- Fax: 202-493-2251.

Instructions: All submissions must include the agency name and docket number. Note that all comments received will be posted without change to <http://www.regulations.gov>, including any personal information provided. Please see the Privacy Act discussion below. We will consider all comments received before the close of business on the comment closing date indicated above. To the extent possible, we will also consider comments filed after the closing date.

Docket: For access to the docket to read background documents or comments received, go to <http://www.regulations.gov> at any time or to 1200 New Jersey Avenue, S.E., West Building Ground Floor, Room W12-140, Washington, D.C. 20590, between 9 a.m. and 5 p.m., Monday through Friday, except Federal Holidays. Telephone: (202) 366-9826.

Privacy Act: Anyone is able to search the electronic form of all comments received into any of our dockets by the name of the individual submitting the comment (or signing the comment, if submitted on behalf of an association, business, labor union, etc.). You may review DOT's complete Privacy Act Statement in the **Federal Register** published on April 11, 2000, (Volume 65, Number 70; Pages 19477–78) or you may visit <http://www.dot.gov/privacy.html>.

Confidential Business Information: If you wish to submit any information under a claim of confidentiality, you should submit three copies of your complete submission, including the information you claim to be confidential business information, to the Chief Counsel, NHTSA, at the address given under FOR FURTHER INFORMATION CONTACT. In addition, you should submit two copies, from which you have deleted the claimed confidential business information, to the Docket at the address given above. When you send a comment containing information claimed to be confidential business information, you should include a cover letter setting forth the information specified in our confidential business information regulation (49 CFR Part 512).

**FOR FURTHER INFORMATION CONTACT:** You may contact Ms. Carla Rush, Office of Crashworthiness Standards, Telephone: 202-366-4583, Facsimile: 202-493-2739 or Mr. John Piazza, Office of Chief Counsel, Telephone: 202-366-2992, Facsimile: 202-366-3820. You may send mail to these officials at: The National Highway Traffic Safety Administration, 1200 New Jersey Avenue S.E., Washington, D.C. 20590.

**SUPPLEMENTARY INFORMATION:**

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**I. Executive Summary**

The Moving Ahead for Progress in the 21st Century Act of 2012 (MAP-21) directs the National Highway Traffic Safety Administration (NHTSA) to initiate a rulemaking proceeding to amend Federal Motor Vehicle Safety Standard (FMVSS) No. 208, “Occupant crash protection,” to require a seat belt use warning system for rear seats. As it continues with this proceeding, NHTSA is seeking comment on a variety of issues related to a potential requirement for a rear seat belt warning system.

Using a seat belt is one of the most effective actions a motor vehicle occupant can take to prevent death and injury in a crash. Seat belts are effective in most types of crashes. Research has found that seat belts greatly reduce the risk of fatal and non-fatal injuries, compared to the risk faced by unrestrained occupants. Unbelted occupants are overrepresented in fatal crashes.

For rear seat occupants, seat belts reduce the risk of fatality by 55 percent (for passenger cars) and 74 percent (for light trucks and vans).<sup>1</sup>

Although seat belt use has steadily increased over the past few decades, usage rates for rear belts have consistently been below those for the front seats. According to data from NHTSA's National Occupant Protection Use Survey, from 2006 to 2017, seat belt use was consistently lower in rear seats than in front seats, with the lowest difference of 6.2 percent in 2007 and the highest difference of 15.6 percent in 2006. Most recently, in 2017, front seat belt use was 89.7 percent, while rear seat belt use was only 75.4 percent, a difference of 14.3 percent.

Seat belt warning systems encourage seat belt use by reminding unbuckled occupants to fasten their belts and/or by informing the driver that an occupant is unbelted, so that the driver can request the unbelted occupant to fasten their seat belt. FMVSS No. 208 requires a seat belt warning system for the driver's seat, but not other seating positions. Most currently-produced vehicles also have a seat belt warning for the front outboard passenger seat, although FMVSS No. 208 does not require this. About 13 percent of model year (MY) 2019 vehicles sold in the United States came equipped with a rear seat belt warning system. Volvo, Toyota, Mazda, Ford and Jaguar Land Rover offer vehicles for sale in the U.S. with rear seat belt warning systems. All of those manufacturers' rear seat belt warning systems use a display that is visible to the driver and indicates which rear seat belts are in use, as well as employing a change-of-status reminder that has visual and audible components.

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<sup>1</sup> Donna Glassbrenner & Marc Starnes. 2009. Lives Saved Calculations for Seat Belts and Frontal Air Bags. DOT HS 811 206. Washington, DC: U.S. Department of Transportation, National Highway Traffic Safety Administration, pp. 18-20.

Euro New Car Assessment Program (NCAP)<sup>2</sup> awards points for front and rear seat belt reminder systems (SBRSS) as part of their Safety Assist score. Their assessment protocol dictates the requirements for the activation and duration of the warning signals for front and rear seats including a change of status warning.

Starting in September 2019, the Economic Commission for Europe (ECE) Regulation No. 16 will require a rear seat belt warning. This includes, among other things, a visual warning indicating any rear seating position in which a seat belt is unfastened. It also includes an audiovisual change-in-status warning.

In 2007, Public Citizen and Advocates for Highway and Auto Safety petitioned NHTSA to amend FMVSS No. 208 to require a seat belt warning system for rear seats on passenger cars and multipurpose passenger vehicles (MPVs) with a gross vehicle weight rating (GVWR) of 4,536 kilograms (10,000 pounds) or less. The petitioners stated that rear seat belt warnings would save hundreds of lives each year and that a large percentage of the lives saved would be children. In 2010, the agency published a Request for Comments (RFC) on the petition. The RFC discussed the agency's research and findings regarding rear seat belt warnings and solicited comments.

In 2012, Congress passed MAP-21. That law requires DOT to initiate a rulemaking proceeding to amend FMVSS No. 208 to provide a safety belt use warning system for designated seating positions in the rear seat. It directs the Secretary to either issue a final rule, or, if the Secretary determines that such an amendment does not meet the requirements and considerations

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<sup>2</sup> Euro NCAP provides consumer information on the safety of new cars. Euro NCAP uses a five-star safety rating system to help consumers, their families and businesses compare vehicles more easily and to help them identify the safest choice for their needs.

of 49 U.S.C. 30111<sup>3</sup>, to submit a report to Congress describing the reasons for not prescribing such a standard. (MAP-21 also repeals a statutory provision that prohibited NHTSA from requiring or specifying as a compliance option an audible seat belt warning lasting longer than 8 seconds.) In accordance with MAP-21, in early 2013, NHTSA initiated a rulemaking proceeding when it submitted for public comment a proposal to undertake a study regarding the effectiveness of existing rear seat belt warning systems. This study, which was completed in 2015, involved a telephone survey of the drivers of vehicles with and without rear seat belt warning systems. The study found that overall, drivers of vehicles with a rear seat belt warning system were satisfied with the system and noticed an increase in rear seat belt use. For example, approximately 80 percent of drivers of vehicles with a rear seat belt warning were satisfied with the system and 65 percent of drivers of vehicles equipped with rear seat belt reminders reported that the rear seat belt reminder made it easier to encourage rear seat passengers to buckle up.<sup>4</sup>

NHTSA has granted Public Citizen and Advocates for Highway and Auto Safety's petition. In accordance with that grant and continuing with the proceeding that MAP-21 required to be initiated, the agency is publishing this Advance Notice of Proposed Rulemaking. In it, we seek comment on a variety of issues related to a requirement for a rear seat belt warning system, including potential requirements for such systems, the vehicles to which they should apply, their effectiveness, the likely consumer acceptance, and the associated costs and benefits. This document also provides relevant background information, such as up-to-date information on rear seat belt warning systems that are currently available on some new motor vehicles. The document also seeks comment on removing the 8-second maximum duration for the driver's seat

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<sup>3</sup> This requires, among other things, that a federal motor vehicle safety standard be practicable, meet the need for motor vehicle safety, and be stated in objective terms.

<sup>4</sup> Below we seek comment on possible sample selection bias (because these survey respondents were drivers of vehicles equipped with rear seat belt warning systems).

belt warning specified in FMVSS No. 208, S7.3; this amendment would reflect MAP-21’s repeal of the statutory limitation that was the basis for this provision.

## **II. Background**

Section 31503 of the Moving Ahead for Progress in the 21st Century Act (MAP-21) (P.L. 112-141) directs the Secretary<sup>5</sup> of Transportation to initiate a rulemaking proceeding to amend Federal Motor Vehicle Safety Standard (FMVSS) No. 208, “Occupant crash protection” (49 CFR 571.208) to require a seat belt use warning system for rear seats.<sup>6</sup> As it continues with this proceeding, the National Highway Traffic Safety Administration (NHTSA) seeks comment on a variety of issues related to a requirement for a rear seat belt warning system, including potential requirements for such systems, the vehicles to which they should apply, their effectiveness, the likely consumer acceptance, and the associated costs and benefits.

Using a seat belt is one of the most effective actions a motor vehicle occupant can take to prevent death and injury in a crash.<sup>7</sup> Seat belts protect occupants in various ways. They prevent occupants from being ejected from the vehicle; provide “ride-down” by gradually decelerating the occupant as the vehicle deforms and absorbs energy; and reduce the occurrence of occupant contact with harmful interior surfaces and other occupants.<sup>8</sup> Seat belts are effective in most types of crashes. Research has found that seat belts greatly reduce the risk of fatal and non-fatal

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<sup>5</sup> Authority has been delegated to NHTSA.

<sup>6</sup> Seat belt use warning systems may also be referred to in this document as seat belt “warning systems” or seat belt “reminder” systems.

<sup>7</sup> 68 FR 46262 (Aug. 5, 2003). *See also* Buckling Up: Technologies to Increase Seat Belt Use. Special Report 278 at 18, Committee for the Safety Belt Technology Study, Transportation Research Board of The National Academies (2003) [hereinafter Transportation Research Board Study].

<sup>8</sup> Charles J. Kahane. 2015. Lives Saved by Vehicle Safety Technologies and Associated Federal Motor Vehicle Safety Standards, 1960 to 2012 – Passenger Cars and LTVs – With Reviews of 26 FMVSS and the Effectiveness of Their Associated Safety Technologies in Reducing Fatalities, Injuries, and Crashes. DOT HS 812 069. Washington, DC: U.S. Department of Transportation, National Highway Traffic Safety Administration, p. 89.



injuries, compared to the risk faced by unrestrained occupants. Unbelted occupants are overrepresented in fatal crashes.<sup>9</sup> Seat belts reduce the risk of fatality for rear outboard occupants by 54 percent (passenger cars) and 75 percent (light trucks and vans), and for center occupants, by 58 percent (passenger cars) and 75 percent (light trucks and vans).<sup>10</sup>

Although seat belt use has steadily increased over the past few decades, usage rates for rear belts have consistently fallen below those for the front seats. According to data from NHTSA's National Occupant Protection Use Survey (NOPUS), from 2006 to 2017, seat belt use was lower in the rear seat than in the front seat, ranging from a difference of 6.2 percent in 2007 (76.3% vs. 82.5%) to 15.6 percent in 2006 (64.8% vs. 80.4%).<sup>11</sup> Front seat belt use in 2017 reached 89.7 percent. Rear seat belt use in 2017, however, was 75.4 percent.<sup>12</sup> See Figure 1.

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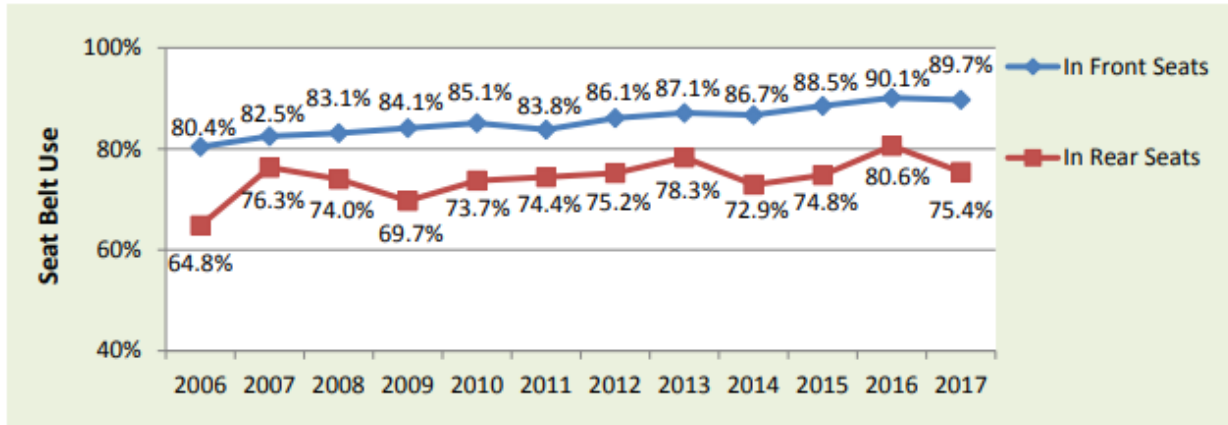
<sup>9</sup> Mark Freedman *et al.* 2009. Effectiveness and Acceptance of Enhanced Seat Belt Reminder Systems: Characteristics of Optimal Reminder Systems, Final Report. DOT HS 811 097. Washington, DC: U.S. Department of Transportation, National Highway Traffic Safety Administration [hereinafter DOT 2009 Belt Warning Study], p. 1.

<sup>10</sup> Charles J. Kahane. 2017. Fatality Reduction by Seat Belts in the Center Rear Seat and Comparison of Occupants' Relative Fatality Risk at Various Seating Positions. DOT HS 812 369. Washington, DC: U.S. Department of Transportation, National Highway Traffic Safety Administration, pp. 18-20.

<sup>11</sup> Li, R., Pickrell, T. M. (2019, February). Occupant restraint use in 2017: Results from the NOPUS controlled intersection study (Report No. DOT HS 812 594). Washington, DC: National Highway Traffic Safety Administration. NOPUS is the only nationwide probability-based observational survey of seat belt use in the United States. The survey observes seat belt use as it actually occurs at randomly-selected roadway sites, and involves a large number of occupants (almost 64,000 in 2015). NOPUS observations are made during daylight hours and are not necessarily representative of high-risk driving times when belt use may be lower.

<sup>12</sup> Li, R., Pickrell, T. M. (2019, February). Occupant restraint use in 2017: Results from the NOPUS controlled intersection study (Report No. DOT HS 812 594). Washington, DC: National Highway Traffic Safety Administration.

**Figure 1 – NOPUS Front and Rear Seat Belt Use Rate**



NHTSA has, over time, used a variety of strategies to increase seat belt use, including sponsoring national media campaigns, providing assistance to states enacting seat belt use laws and high-visibility enforcement campaigns, and facilitating or requiring vehicle-based strategies. Some of these strategies are non-regulatory; some are regulatory. NHTSA has implemented a variety of non-regulatory approaches to increase seat belt use, such as the annual Click It or Ticket mobilization, which includes a national advertising campaign backed up by high-visibility local enforcement of state seat belt laws. Some states with mandatory rear seat belt laws include rear-seat specific messaging in their media campaigns.

One type of vehicle-based strategy is seat belt warning systems. Seat belt warning systems encourage seat belt use by reminding unbuckled occupants to fasten their belts and/or by informing the driver that an occupant is unbelted, so that the driver can request the unbelted occupant to fasten their seat belt.<sup>13</sup> The warnings provided by seat belt warning systems typically consist of visual and/or audible signals. An optimized warning system balances

<sup>13</sup> Akamatsu, M., Hashimoto, H., and Shimaoka, S., "Assessment Method of Effectiveness of Passenger Seat Belt Reminder," SAE Technical Paper 2012-01-0050, 2012, doi:10.4271/2012-01-0050.

effectiveness and annoyance, so that the warning is noticeable enough that the occupants will be motivated to fasten their belts, but not so intrusive that an occupant will circumvent or disable it or the public will not accept it.<sup>14</sup> FMVSS No. 208 requires a seat belt warning system for the driver's seat, but not other seating positions. Most currently-produced vehicles also have a seat belt warning for the front outboard passenger seat, although FMVSS No. 208 does not require this.

Based on the agency's New Car Assessment Program (NCAP) Buying a Safer Car data, about 13 percent of model year (MY) 2019 vehicles sold in the United States came equipped with a rear seat belt warning system. Volvo, Toyota, Mazda, Ford and Jaguar Land Rover offer vehicles for sale in the U.S. with rear seat belt warning systems. Volvo started offering rear seat belt warnings in its vehicles in 2009 and currently all its vehicle models are equipped with rear seat belt warnings. Mazda and Ford introduced rear seat belt reminders in MY 2018 and 2019, respectively. Mazda MY 2019 CX-9, CX-5, 3, and 6 vehicles are equipped with rear seat belt reminder systems (SBRS), and Ford offers such systems on the Ranger. GM also offered rear seat belt warning systems as standard equipment in the United States (starting in MY 2010 for the Cadillac SRX and MY 2011 for the Volt) and such systems were offered on the Cadillac MY 2016 XTS and MY 2015 ELR, as well as the MY 2016 Chevy SS. Jaguar Land Rover first introduced rear seat belt warning systems in the MY 2010 Jaguar XJ, and since then has equipped four additional vehicles models with such systems (Range Rover Evoque, Range Rover, Range Rover Sport, and Discovery Sport). Toyota introduced rear seat belt warning systems in several MY 2017 vehicles and increased the number of equipped vehicles in MY 2018. All of these manufacturers' rear seat belt warning systems use a display that is visible to

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<sup>14</sup> See, e.g., Transportation Research Board Study, p. 25; DOT 2009 Belt Warning Study, p. 2.

the driver and indicates which rear seat belts are in use, as well as employing a change-of-status reminder that has visual and audible components.

Euro NCAP introduced SBRS bonus points in 2002. The Euro NCAP protocol for Safety Assist systems describes which features a seat belt reminder must have to qualify for extra points.<sup>15</sup> For rear seats, a visual signal must start once the ignition switch is engaged. The visual signal must be at least 60 seconds long. For systems without occupant detection, the visual signal must clearly indicate to the driver which seat belts are in use and not in use. For systems with occupant detection on all rear seating positions, the visual signal does not need to indicate the number of seat belts in use or not in use, but the signal must remain active if a seat belt remains unfastened on any of the occupied seats in the rear. No visual signal is required if all the rear occupants are belted. For systems with rear seat occupant detection, a 30-second audible signal needs to activate before reaching a vehicle speed of 25 km/h or before traveling 500 meters when any occupied seat has an unbuckled belt. Except for change of status events, the system may allow the driver to acknowledge the signal for rear seats and switch it off.<sup>16</sup> Furthermore, when any seat belt experiences a change of status at vehicle speeds above 25 km/h, an audiovisual signal is required; the requirements for this warning are the same as for the seat belt reminder.

The European Union is set to adopt an updated version of Regulation No. 16<sup>17</sup> of the Economic Commission for Europe of the United Nations (UNECE) that will require seat belt

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<sup>15</sup> European New Car Assessment Programme Assessment Protocol – Safety Assist, Version 8.0.2, November 2017

<sup>16</sup> For front seat belts, the assessment protocol requires both a visual and an audible warning signal. The front occupant visual signal must remain active until the seat belt is fastened. The audible signal for the front occupants has two stages, an initial and final audible signal, which have different onset criteria. The initial audible signal must not exceed 30 seconds and the final audible signal must be at least 90 seconds. To prevent unnecessary signals, the system must also be capable of detecting whether the front passenger seat is occupied.

<sup>17</sup> ECE Regulation No. 16, Revision 9.

reminder systems in all front and rear seats on new cars beginning in September 2019.<sup>18</sup> For the front seats the seat belt reminder system is required to have a 2-level approach. The first level warning consists of a visual warning that is active for at least 30 seconds when any occupied front seat has an unfastened seat belt. The second level warning is triggered by threshold criteria based on distance traveled, speed, or duration of travel, which are determined by the manufacturer. The second level warning consists of a visual and audible signal activated for at least 30 seconds, not counting periods in which the warning may stop for up to 3 seconds. A change in seat belt status in front and rear seats also initiates the second level warning. For rear seats, only the first level warning is required, which consists of a visual warning that must be active for at least 60 seconds. The visual warning must indicate any seating position in which the seat belt is unfastened, so as to allow the driver to identify any unbelted occupants while facing forward in the driver's seat. For vehicles that have information on the occupancy status of the rear seats, the visual warning does not need to indicate unfastened seat belts for unoccupied seating positions. Also, the first level warning for rear seats can be dismissed by the driver.

### **III. Regulatory and Legislative History**

#### Current Driver's Seat Belt Warning Requirements

FMVSS No. 208 is intended to reduce the likelihood of occupant deaths and the likelihood and severity of occupant injuries in crashes. The standard took effect in 1968 and from its inception required seat belts in passenger cars.<sup>19</sup>

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<sup>18</sup> The regulation will be introduced in two phases: September 1, 2019 for new vehicle types, i.e. applied to all vehicle models that get a new type approval and September 1, 2021 for all newly produced and registered vehicles.

<sup>19</sup> 32 FR 2408, 2415 (Feb. 3, 1967) (initial Federal motor vehicle safety standards).

The standard currently requires a seat belt warning for the driver's seat belt on passenger cars;<sup>20</sup> trucks and multipurpose passenger vehicles (MPVs) with a gross vehicle weight rating (GVWR) of 4,536 kilograms (kg) (10,000 pounds (lb)) or less (except for some compliance options which do not require the warning);<sup>21</sup> and buses with a GVWR of 3,855 kg (8,500 lb) or less and an unloaded weight less than or equal to 2,495 kg (5,500 lb).<sup>22</sup> The regulations do not require seat belt warnings for any seating position other than the driver's seat.<sup>23</sup>

Manufacturers have two compliance options for the driver's warning.<sup>24</sup> The first option requires that if the key is in the "on" or "start" position and the seat belt is not in use, the vehicle must provide a visual warning for at least 60 seconds, and an audible warning that lasts 4 to 8 seconds. Under the second option, when the key is turned to the "on" or "start" position, the vehicle must provide a visual warning for 4 to 8 seconds (regardless of whether the driver seat belt is fastened) and an audible warning lasting 4 to 8 seconds, if the driver seat belt is not in use. What is now the second option (S7.3(a)(2)) became effective in 1974 and has remained unchanged since then.<sup>25</sup> What is now the first option (S7.3(a)(1)) was added to S7.3 in 1991.<sup>26</sup>

#### NHTSA Experience in the 1970s: Consumer Backlash Against Seat Belt Interlock and Subsequent Statutory Limitation on Belt Warning Requirements

Prior to 1974, NHTSA had promulgated a series of occupant protection regulations that, at various times, specified as compliance options various combinations of active and passive

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<sup>20</sup> S4.1.5.1(a)(3); S7.3.

<sup>21</sup> S4.2.6; S7.3.

<sup>22</sup> S4.2.6 (with the exception of some options).

<sup>23</sup> See, e.g., Interpretation Letter from NHTSA to R. Lucki (July 24, 1985) ("Thus, the intent was to require a warning system for only the driver's position."), available at <http://isearch.nhtsa.gov/search.htm>.

<sup>24</sup> 49 CFR 571.208, S7.3.

<sup>25</sup> See 39 FR 42692 (Dec. 4, 1974).

<sup>26</sup> See 56 FR 3222 (Jan. 29, 1991). The warning requirements for automatic belts in S4.5.3 mirror, with some differences, the first compliance option. Automatic belts are rarely, if ever, installed in current production vehicles, and NHTSA's regulations limit the seating positions for which automatic belts may be used to rear seats.

occupant crash protection, seat belt interlocks, and seat belt warnings.<sup>27</sup> A seat belt warning was first required in 1971, when NHTSA sought to increase seat belt use by adopting occupant protection compliance options that included the use of a seat belt warning for the front outboard seating positions.<sup>28</sup> This seat belt warning option required audible and visible warning signals that lasted for as long as the occupant was unbelted, the ignition was “on,” and the transmission was in forward or reverse. In 1972, NHTSA adopted occupant protection options for passenger cars that included (for cars that did not provide automatic protection) an interlock system that would prevent the engine from starting if any of the front seat belts were not fastened.<sup>29</sup> Contrary to the agency’s expectations, the initial vehicle introduction of these systems in the early 1970s was not well-received by the public. In particular, continuous buzzers and ignition interlocks annoyed many consumers to the point of their disabling or circumventing the systems.

As a result of the strong negative consumer reaction, Congress adopted a provision, as part of the Motor Vehicle and School Bus Safety Amendments of 1974, prohibiting the agency from prescribing a motor vehicle safety standard that required, or permitted as a compliance option, seat belt interlocks or audible seat belt warnings lasting longer than eight seconds.<sup>30</sup> In response, NHTSA amended FMVSS No. 208 in 1974 to require that only the driver seating position be equipped with a seat belt warning system providing a visual and audible warning,

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<sup>27</sup> “Active protection” refers to features, such as manual seat belts, that require action by the occupant, while “passive protection,” sometimes called “automatic protection,” refers to safety features that do not require any action by the occupant other than sitting in a designated seating position. Seat belt interlocks prevent starting or operating a motor vehicle if an occupant is not using a seat belt. For a fuller discussion of the history of the active and passive protection requirements in FMVSS No. 208, see Stephen R. Kratzke, *Regulatory History of Automatic Crash Protection in FMVSS 208*, SAE Technical Paper 950865, International Congress and Exposition, Society of Automotive Engineers, Detroit, Michigan, Feb. 27-March 2 (1995).

<sup>28</sup> 36 FR 4600 (May 10, 1971).

<sup>29</sup> 37 FR 3911 (Feb. 24, 1972).

<sup>30</sup> These amendments were codified at 49 U.S.C. 30124. As explained below, this provision was amended in 2012 by MAP-21.

with the audible warning not lasting longer than eight seconds.<sup>31</sup> The limited duration driver's seat belt warning requirement has remained in the standard, with some changes, since 1974. NHTSA has not subsequently amended FMVSS No. 208 to require seat belt warnings for any of the passenger seating positions.

### Recent Regulatory History

In 2001, the House Committee on Appropriations directed NHTSA to contract with the Transportation Research Board (TRB) of the National Academy of Sciences to conduct a study on the benefits and acceptability of minimally intrusive vehicle technologies to increase seat belt use.<sup>32</sup> The Committee also requested that the study consider potential legislative and regulatory actions to facilitate installation of devices to encourage seat belt use. The TRB report (published in 2004) found that new seat belt use technologies could increase belt use without being overly intrusive.<sup>33</sup> It recommended that rear seat belt warning systems be developed and that NHTSA undertake a broad, multi-year program of research on the effectiveness and acceptability of different seat belt warning systems to establish a basis for future regulation. It also recommended that Congress amend the Safety Act to eliminate the 8-second limit on the length of the audible warning.

In 2002 and 2003, NHTSA sent letters to several vehicle manufacturers encouraging them to enhance seat belt warning systems beyond the FMVSS No. 208 minimum requirements.<sup>34</sup> (An "enhanced" warning system is one with visual and/or audible warning signals that exceed the maximum durations specified in S7.3, and/or that applies to seating positions other than the driver's seat). The agency also determined that the Safety Act did not

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<sup>31</sup> 39 FR 42692 (Dec. 6, 1974).

<sup>32</sup> House Report 107-108, June 22, 2001.

<sup>33</sup> Transportation Research Board Study, p. 9.

<sup>34</sup> See Docket No. NHTSA-2002-13226.



prohibit manufacturers from implementing enhanced warning systems as long as the manufacturer provided some means of differentiating the voluntarily-provided signal from the required signal (for example, by a clearly distinguished lapse in time between the two signals).<sup>35</sup> Many vehicle manufacturers subsequently implemented enhanced seat belt warnings for the driver and front outboard passenger seating positions. Based on information submitted to the agency in connection with the agency's NCAP for MY 2018, 99.9 percent of participating vehicle models offered for sale in the U.S. had an enhanced warning (audio and/or visual) for the driver, right front passenger, or both, with a duration exceeding the FMVSS No. 208 requirement.<sup>36</sup>

In 2005, Congress passed legislation – the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU)<sup>37</sup> – that required NHTSA to evaluate the effectiveness and acceptability of several different types of enhanced seat belt warnings offered by a number of manufacturers. In response, the agency conducted a multi-phase research study (described below).

On November 21, 2007, Public Citizen and Advocates for Highway and Auto Safety (petitioners) petitioned NHTSA to amend FMVSS No. 208 to require a seat belt warning system for rear seats on passenger cars and MPVs with a GVWR of 4,536 kg (10,000 lb) or less.<sup>38</sup> The petitioners noted that primary enforcement laws typically do not cover rear seat occupants and asserted that studies have proven that warnings for rear seat belts significantly increase rear passenger seat belt use. The petitioners further asserted that rear seat belt warnings are

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<sup>35</sup> See Docket Nos. NHTSA-2001-9899, NHTSA-2002-13379, NHTSA-2003-14742, NHTSA-2003-15006, and NHTSA-2003-15156.

<sup>36</sup> IIHS reported that enhanced SBRs are standard equipment for the driver and front passenger in 90 and 78 percent, respectively, of the 2013 vehicle models. This is based on the data maintained in their Highway Loss Data Institute, Vehicle Information Database.

<sup>37</sup> Pub. L. No. 109-59, § 10306 (2005).

<sup>38</sup> Docket No. NHTSA-2010-0061-0002.

technologically feasible and would be less costly if they were required in all vehicles. The petitioners provided a range of estimates for how much a rear seat belt warning system could increase rear belt use. Petitioners asserted that rear seat belt warnings would save hundreds of lives each year and that a large percentage of the lives saved would be children.

On June 29, 2010, the agency published a Request for Comments (RFC) on the petition.<sup>39</sup> The RFC discussed the agency's research and findings regarding requiring rear seat belt warnings and solicited comments. The agency received 26 comments. Five commenters opposed requiring rear seat belt warnings: Ford Motor Company, General Motors, the Alliance of Automobile Manufacturers, the Association of International Automobile Manufacturers (now known as the Association of Global Automakers), and a commenter from the general public. Among those that supported requiring rear seat belt warnings were IEE S.A., Consumers Union, Insurance Institute for Highway Safety, the Automotive Occupant Restraint Council (now known as the Automotive Safety Council), and the American Academy of Pediatrics. NHTSA has granted the petition.

In 2012, Congress passed MAP-21.<sup>40</sup> MAP-21 contains two provisions regarding seat belt warning systems. First, it repeals the statutory provision that prohibited NHTSA from requiring or specifying as a compliance option an audible seat belt warning lasting longer than 8 seconds.<sup>41</sup> Second, it requires the Secretary to initiate a rulemaking proceeding to amend FMVSS No. 208 to provide a safety belt use warning system for designated seating positions in the rear seat.<sup>42</sup> It directs the Secretary to either issue a final rule, or, if the Secretary determines

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<sup>39</sup> 75 FR 37343 (June 29, 2010) (Docket No. NHTSA-2010-0061).

<sup>40</sup> Moving Ahead for Progress in the 21st Century Act (MAP-21), Pub. L. No. 112-141 (2012).

<sup>41</sup> *Id.* at § 31202(a)(2) (repealing portion of 49 U.S.C. 30124).

<sup>42</sup> *Id.* at § 31503.

that such an amendment does not meet the requirements and considerations of 49 U.S.C. 30111,<sup>43</sup> to submit a report to Congress describing the reasons for not prescribing such a standard. In accordance with MAP-21, in early 2013 NHTSA initiated a rulemaking proceeding when it submitted for public comment a proposal to undertake a study regarding the effectiveness of existing rear seat belt warning systems.<sup>44</sup> (The results of this study, which involved a consumer phone survey and was completed in 2015, are discussed later in this document.)

#### **IV. NHTSA Research on Effectiveness and Acceptance of Seat Belt Warnings**

In light of the Congressional directives concerning seat belt warnings, NHTSA has taken a variety of actions to research the effectiveness and acceptance of seat belt warnings.

In 2002, the agency chartered an integrated project team to recommend strategies for increasing seat belt use.<sup>45</sup> The team's report, issued in 2003, observed that "[d]espite the significant increases over the past twenty years, safety belt use in the United States falls short of that in some industrialized nations."<sup>46</sup> The report also noted that there are a "wide range of initiatives . . . that have the potential to raise and/or sustain safety belt use rates." The report went on to identify several such initiatives, which it classified as either behavioral or vehicle-based. The behavioral strategies were upgrading existing state seat belt laws; high-visibility enforcement campaigns; a national communications plan; employer policies and regulation; and insurance industry collaboration. The vehicle-based strategies included encouraging vehicle manufacturers to voluntarily install enhanced seat belt warning systems; providing consumer

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<sup>43</sup> Section 30111 requires that a Motor Vehicle Safety Standard meet the need for safety, be stated in objective terms, and be practicable, among other requirements. *See infra*, Part V.

<sup>44</sup> 78 FR 5865 (Jan. 28, 2013).

<sup>45</sup> *See* 68 FR 46262 (Aug. 5, 2003).

<sup>46</sup> U.S. Department of Transportation, National Highway Traffic Safety Administration. July 2003. Initiatives to Address Safety Belt Use, *available at* [www.regulations.gov](http://www.regulations.gov) (docket NHTSA-2003-14621).

information on vehicles equipped with enhanced warning systems as part of NCAP; and continued monitoring and assessment of the effectiveness and acceptability of enhanced seat belt warnings through research.

In response to the 2005 SAFETEA-LU mandate, NHTSA undertook a multi-phase research study of seat belt warnings. NHTSA published several reports. Three are particularly relevant to today's ANPRM. The first is a large-sample national observational study on the effectiveness of front seat belt warnings.<sup>47</sup> The study covered several states in different parts of the country. The vehicles in the study sample had a wide variety of seat belt warning systems. These included warning systems that had only the minimum features required by FMVSS No. 208, as well as twenty different enhanced warning systems. Because of the detail of the data gathered (*e.g.*, occupant demographic and vehicle-specific information), the analysis was able to control for confounding factors. The second study used an experimental or focus-group-based approach to study consumer acceptance as well as effectiveness.<sup>48</sup> The third report summarized and extended the analyses from the previous two reports.<sup>49</sup> This series of research studies showed, among other things, that the presence of an enhanced front seat belt reminder system increased front outboard passenger seat belt use by about 3 to 4 percentage points more than in vehicles with only a driver seat belt warning system meeting the minimum requirements in S7.3.

NHTSA continued and expanded on this work several years later. In 2015 the agency completed an additional report on the effectiveness and consumer acceptance of rear seat belt

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<sup>47</sup> Mark Freedman *et al.* The Effectiveness of Enhanced Seat Belt Reminder Systems Draft Report: Observational Field Data Collection Methodology and Findings. 2007. DOT HS-810-844. Washington, DC: National Highway Traffic Safety Administration.

<sup>48</sup> N. Lerner *et al.* 2007. Acceptability and Potential Effectiveness of Enhanced Seat Belt Reminder System Features. DOT HS 810 848. Washington, DC: National Highway Traffic Safety Administration [hereinafter DOT 2007 Acceptability Study].

<sup>49</sup> DOT 2009 Belt Warning Study, *supra*.

warnings, based on a consumer survey.<sup>50</sup> This study utilized a telephone survey of the drivers of vehicles with and without rear seat belt warning systems. The study found that overall, drivers of vehicles with a rear seat belt warning system were satisfied with the system and noticed an increase in rear seat belt use. For example, among drivers of vehicles with a rear seat belt warning, approximately 80 percent were satisfied with the system and 65 percent reported that the rear seat belt warning made it easier to encourage rear seat passengers to buckle up.

The results of NHTSA's research are discussed in more detail in Section VI.A and VI.C-D. The relevant research reports have also been placed in the docket for this rulemaking.

## **V. NHTSA's Statutory Authority**

Under 49 U.S.C. Chapter 301, Motor Vehicle Safety (49 U.S.C. 30101 et seq.), the Secretary of Transportation is responsible for prescribing motor vehicle safety standards that are practicable, meet the need for motor vehicle safety, and are stated in objective terms.<sup>51</sup> "Motor vehicle safety" is defined in the Motor Vehicle Safety Act as "the performance of a motor vehicle or motor vehicle equipment in a way that protects the public against unreasonable risk of accidents occurring because of the design, construction, or performance of a motor vehicle, and against unreasonable risk of death or injury in an accident, and includes nonoperational safety of a motor vehicle."<sup>52</sup> "Motor vehicle safety standard" means a minimum performance standard for motor vehicles or motor vehicle equipment.<sup>53</sup> When prescribing such standards, the Secretary must consider all relevant, available motor vehicle safety information.<sup>54</sup> The Secretary must also

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<sup>50</sup> Paul Schroeder & Melanie Wilbur. 2015. Survey of Principal Drivers of Vehicles with a Rear Seat Belt Reminder System. Washington, DC: National Highway Traffic Safety Administration. [Found in the docket for this ANPRM.]

<sup>51</sup> 49 U.S.C. 30111(a).

<sup>52</sup> 49 U.S.C. 30102(a)(8).

<sup>53</sup> 30102(a)(9).

<sup>54</sup> 30111(b)(1).

consider whether a proposed standard is reasonable, practicable, and appropriate for the types of motor vehicles or motor vehicle equipment for which it is prescribed and the extent to which the standard will further the statutory purpose of reducing traffic accidents and associated deaths.<sup>55</sup> The responsibility for promulgation of Federal motor vehicle safety standards is delegated to NHTSA.<sup>56</sup>

MAP-21 requires the Secretary to initiate a rulemaking proceeding to amend FMVSS No. 208 to provide a safety belt use warning system for designated seating positions in the rear seat.<sup>57</sup> It directs the Secretary to either issue a final rule, or, if the Secretary determines that such an amendment does not meet the requirements and considerations of 49 U.S.C. §30111, to submit a report to Congress describing the reasons for not prescribing such a standard.

## **VI. Issues on Which NHTSA Seeks Information from the Public**

As it continues with the proceeding required to be initiated by MAP-21, NHTSA seeks comment on a variety of issues related to amending FMVSS No. 208 to require a rear seat belt warning system. These include: the types of seat belt warning system requirements the agency should propose; the effectiveness of such systems at increasing rear seat belt use; the degree to which consumers would accept such systems; the associated benefits and costs; and the vehicles to which any proposed requirements should apply.

### **A. Potential Specifications for a Required Rear Belt Warning System**

NHTSA is considering proposing any of a variety of minimum requirements for a rear seat belt warning system. There are a variety of aspects of the possible proposed requirements that we seek comment on. NHTSA especially seeks any data related to these issues.

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<sup>55</sup> 30111(b)(3)-(4).

<sup>56</sup> See 49 CFR Part 1.95.

<sup>57</sup> Moving Ahead for Progress in the 21st Century Act (MAP-21), Pub. L. 112-141, § 31503 (2012).

1. *Should the warning be visual-only, audible-only, or audio-visual?* If NHTSA were to propose requirements for a warning that is similar to existing seat belt warnings, should the warning be visual-only (*e.g.*, a telltale displaying text or icons), audio-only, or audio-visual? (Below we also seek comment on alternative non-traditional approaches.) FMVSS No. 208 requires the driver's seat belt warning to be audio-visual. Seat belt warnings for front outboard passenger seats (which are not required by FMVSS No. 208) currently on the market are also typically audio-visual. NHTSA's research suggests that audible warnings in conjunction with visual warnings are generally more effective than text or icons alone, but are also more intrusive.<sup>58</sup> However, research has not yet firmly established which system characteristics are optimal.<sup>59</sup> Neither Euro NCAP or the ECE regulation require an audible warning for rear seats.

➤ Below we ask specific questions about potential specifications for visual and audible warnings, and, more generally, which of these NHTSA should propose for the rear seat belt warning system minimum requirements. Should whether the warning is visual or audible depend on when the warning is given and what it is for (*e.g.*, a visual warning at the beginning of the trip and an audible warning during the trip if a buckled belt becomes unfastened)? Should it also depend on the recipient of the warning (for example, driver versus rear passenger)?

NHTSA also seeks comment on whether an audible warning alone, without a visual warning, would be an effective way to alert the driver to the status of the rear seat belts and increase rear seat belt use. For example, would an audible notification (*e.g.*, a chime) indicating that a rear-seat occupant had buckled the belt effectively inform the driver (or

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<sup>58</sup> DOT 2009 Belt Warning Study, *supra*, p. 39 (drivers); p. 45 (passengers)

<sup>59</sup> DOT 2009 Belt Warning Study, p. 1.

facilitate the driver in determining) whether there were any unbuckled rear-seat occupants?

We also seek comment on the costs and benefits of different types of warnings.

2. *Triggering conditions.* Since seat belt warning systems are generally initiated at the beginning of a trip (i.e., when the ignition switch is moved to the “on” or “start” position) so as to assure that occupants are safely restrained prior to any potential vehicle crash, this is perhaps the most intuitive approach for rear seat belt warnings as well. However, might it be preferable to delay the warning to a time when the warning could be given greater attention and, perhaps, the driver (or other occupant) is less distracted? Would delaying the warning until the vehicle is placed in gear make it more likely that the occupants fasten their belts before the vehicle is in motion? Are there other triggering conditions for the start of a trip NHTSA should consider, and what would be the justification for choosing them? Would the triggering condition necessitate occupant detection? Should the warning be required/allowed/disallowed if the/a belt is buckled?

In addition to a warning at the beginning of a trip, should there be a warning if a seat belt becomes unbuckled in the course of a trip (a change-of-status warning)? Such a warning may reduce the risk of injury to children by alerting the driver that a child has unbuckled his or her seat belt, providing the driver an opportunity to direct the child to re-buckle the belt.

The signal may also potentially prevent children from unbuckling their seat belts. The agency’s 2015 Survey of Principal Drivers of Vehicles with a Rear Seat Belt Reminder System found that a change of status warning is effective in getting passengers to refasten their seat belt.<sup>60</sup> Volvo and Jaguar Land Rover vehicles sold in the United States and

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<sup>60</sup> Paul Schroeder & Melanie Wilbur. 2015. Survey of Principal Drivers of Vehicles with a Rear Seat Belt Reminder System. Washington, DC: National Highway Traffic Safety Administration, [Found in the docket for this ANPRM.]



equipped with rear seat belt warnings provide a change-of-status warning. In addition, a change-of-status warning is required by the new ECE regulation No. 16 and is also required to obtain bonus points for a seat belt reminder system by Euro NCAP.<sup>61</sup>

If NHTSA should propose a change-of-status warning, what should the triggering condition(s) be? Should it be linked to the vehicle's speed and/or transmission position (*e.g.*, forward or reverse, or other criteria), and if so, what should the criteria be, and why? Similarly, should there be criteria for the duration of the warning? In order to earn bonus points, Euro NCAP requires the system to activate the change of status warning immediately at vehicle speeds over 25 km/h. If the change of status occurs below 25km/h and no doors are opened, the signal may be delayed until the vehicle has been in motion for 500 meters.<sup>62</sup> The ECE regulation uses similar thresholds, but lets the manufacturer choose either a speed, distance traveled, or a duration threshold.<sup>63</sup> Are there situations when the warning at a low speed would result in an unnecessary or unwanted warning, and how frequently would such situations occur?

3. *Alternative warning systems.* NHTSA also seeks comment on whether it should require or specify as a compliance option a rear seat belt warning that differs from the type of audio-visual warning that is currently required for the driver's seat belt. Alternatives to a visual warning (telltale) on vehicle start-up could include an audible signal, either electronic or mechanical, or a haptic warning (*e.g.*, steering wheel or seat vibration). Similarly, an audible or visual warning of a change in the status of rear seat belts could be either electronic or mechanical and could include a haptic signal. For example, to what extent does the sound of

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<sup>61</sup> ECE Regulation No. 16, Revision 9 § 8.4.3.3 and 8.4.4.5; European New Car Assessment Programme Assessment Protocol – Safety Assist, § 3.1.5.

<sup>62</sup> European New Car Assessment Programme Assessment Protocol – Safety Assist, § 3.3.2

<sup>63</sup> ECE Regulation No. 16, Revision 9 § 8.4.2.4.1.1. to 8.4.2.4.1.3

the latch plate clicking into the buckle when a belt is fastened currently serve as an indication of seat belt use? Would that sound, perhaps augmented, serve as an effective notice to the driver that a rear-seat occupant had buckled the belt, or the lack of such sound indicate that a rear-seat occupant had not buckled the belt? To facilitate an effective warning that advances safety and is appropriate for diverse vehicle types and uses, NHTSA seeks comment on alternative cost-effective solutions that would alert the driver when a rear seat passenger buckles and/or unbuckles. For any alternative warning systems/signals that are identified, NHTSA seeks information on the issues we identify below. For example, how would such an alert function if there were multiple rear-seat occupants? Would the warning be distinguishable from other alerts that are provided to the driver? How would the costs and benefits of such a warning compare to more traditional types of warnings?

4. *Occupant detection technology.* NHTSA also seeks comment on warning systems that utilize occupant detection.

Rear seat warning systems that employ occupant detection have potential advantages over systems that do not utilize it. With occupant detection, a warning system can provide more informative warnings. The system can determine whether any seats are occupied by an unbelted occupant, as opposed to simply notifying the driver which or how many belts, if any, are fastened. Such systems are also better able to appropriately target audible warnings or longer-duration visual warnings (enhanced warnings). Having an audible or longer-duration visual warning activate for an unoccupied seat (such as might be the case if the system did not have occupant detection) could be a nuisance for the driver and might either desensitize the occupants to the warning signal, or lead them to circumvent or defeat the system.

However, occupant detection for the rear seats may present both technical and cost challenges.<sup>64</sup> Rear seats are used in ways that complicate occupant detection. Rear seats may frequently be used to transport cargo such as groceries, pets, and other heavy objects, which could be mistaken for an occupant. Rear seats are frequently used for child restraint systems attached by a child restraint anchorage system, or LATCH.<sup>65</sup> An occupant detection system in the rear seat may have difficulty detecting a child restraint system. In addition, rear seats may be less well-defined than most front seats, which could make it more challenging for a sensor to define seat occupancy accurately. For example, it may be technically challenging for an occupant detection system to recognize a large occupant spanning multiple seating positions as a single occupant rather than two occupants. These challenges may be greater or lesser depending on the rear seat configuration of the vehicle. A seat belt warning system utilizing occupant detection technology could provide false reminders if the occupant detection were inaccurate. A problem with false reminders is that they can lead occupants to disregard or attempt to circumvent the system, defeating the purpose of such systems. Occupant detection is also likely to add cost to a rear seat warning system. Euro NCAP does not specify that occupant detection for rear seats is needed in order to obtain bonus points.<sup>66</sup> The ECE regulations do not require occupant detection.

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<sup>64</sup> In the U.S., occupant detection is widely used in existing vehicles in the front outboard designated seating positions, either as part of an advanced air bag system, or as part of a voluntary seat belt warning system. Occupant detection is utilized by the advanced air bags to properly classify the occupant in the seat (e.g., child, adult, small-statured adult) so that the advanced frontal air bag systems can determine if and with what level of power the front air bag will inflate. We believe that occupant detection is voluntarily used in the front passenger seat to avoid having an audible warning activate for an unoccupied seat. Occupant detection systems are practical for the front outboard passenger seating position, as that passenger seat is not typically subject to as many of the potential complications to occupant detection posed by rear seats (such as large occupants spanning multiple seating positions).

<sup>65</sup> Many in the child passenger safety community refer to the child restraint anchorage system as the “LATCH” system, an abbreviation of the phrase “Lower Anchors and Tethers for Children.” The term was developed by a group of manufacturers and retailers for use in educating consumers on the availability and use of the anchorage system and for marketing purposes.

<sup>66</sup> European New Car Assessment Programme Assessment Protocol – Safety Assist, § 3.3.

We seek comment on whether NHTSA should propose warning system requirements that would necessitate occupant detection for the rear seats, and the technical and cost feasibility of doing so.

NHTSA also seeks comment on proposing multiple compliance options for the warning system requirements. Should all the compliance options require occupant detection, or should there be some compliance options that do not require occupant detection? To what extent should we expect increased effectiveness and benefits for a system utilizing occupant detection compared to a system without such technology? What would be the increased cost associated with such a system (on a per seat and per vehicle basis), and how would it compare to the increased benefits (if any)?

5. *Enhanced warning systems.* Enhanced warning systems utilize warnings that are relatively longer-lasting or have an audible component beyond the minimum FMVSS No. 208 requirements for the driver's seat warning. Research by NHTSA and others suggests that audible warnings in conjunction with visible warnings are potentially more effective than visible warnings alone.<sup>67</sup> As noted above, an enhanced warning that activates for an unoccupied seat could be a nuisance that either desensitizes the occupants to the warning signal or leads them to circumvent or defeat the warning. Enhanced warnings therefore generally need to work in conjunction with an occupant detection system, and even this might not completely eliminate the possibilities of false warnings (for example, if a rear seat is occupied by a pet or groceries).

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<sup>67</sup> See, e.g., DOT 2009 Belt Warning Study, *supra*, pp. 54, 57. See also Paul Schroeder & Melanie Wilbur. 2015. Survey of Principal Drivers of Vehicles with a Rear Seat Belt Reminder System. Washington, DC: National Highway Traffic Safety Administration, p. 66; and IIHS Status Report Vol. 54, No. 3, April 25, 2019, p. 5. [Found in the docket for this ANPRM.]

In addition to this, while enhanced warnings are potentially more effective due to their persistence and annoyance,<sup>68</sup> they also present potential consumer acceptance challenges for the same reasons. Considering the history in this area as described above, the agency is particularly concerned with striking the right balance. NHTSA's research suggests that there is an inherent trade-off between effectiveness and acceptability.<sup>69</sup> The agency's research has noted that no clear consensus exists about which warning system features are most acceptable,<sup>70</sup> and that the data regarding acceptance so far are "limited, subjective, and anecdotal."<sup>71</sup> It has also been pointed out that the research on seat belt use and acceptability among drivers may not be representative of situations where multiple passengers are present and that further evaluation is warranted on the annoyance and acceptance of seat belt warnings.<sup>72</sup> Euro NCAP specifies that, if there is no occupant detection, only a 60 second visual signal is needed for the rear warning in order to earn bonus points, and the new ECE regulation also only requires a 60 second visual signal for the rear warning.<sup>73</sup> We seek comment on whether the rear warning system should be required to include audible or visual warning features exceeding those currently required for the driver's seat belt warning (including the costs and benefits) and if so, what those features should be.

6. *Belt use criteria.* The current driver's belt warning requirements specify that a belt is "not in use" when, at the option of the manufacturer, either the seat belt latch mechanism is not fastened or the belt is not extended at least 10.16 centimeters (cm) (4 inches (in)) from its

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<sup>68</sup> See, e.g., DOT 2009 Belt Warning Study, *supra*, p. 54.

<sup>69</sup> See *id.* p. 60.

<sup>70</sup> DOT 2009 Belt Warning Study, *supra*, p. 8; Schroeder & Wilbur, *supra*, p. 33.

<sup>71</sup> DOT 2007 Acceptability Study, *supra*, p. 41.

<sup>72</sup> DOT 2007 Acceptability Study, *supra*, pp. 41-42.

<sup>73</sup> ECE Regulation No. 16, Revision 9 § 8.4.2.3.1; European New Car Assessment Programme Assessment Protocol – Safety Assist, §3.3.1.1.

stowed position.<sup>74</sup> Should NHTSA retain these criteria to determine if a rear seated occupant is belted, and if not, what should the criteria be, and why?

7. *Seat occupancy criteria.* If NHTSA were to propose system requirements for occupant detection (either mandatory or as a compliance option), seat occupancy criteria might be necessary to objectively specify when a seat is occupied for the purposes of NHTSA's compliance testing. Because the existing seat belt warning requirements in S7.3 apply only to the driver seat, they do not contemplate an occupant detection system (because, traditionally, driver seat occupancy could be assumed).

Accordingly, NHTSA might need to propose seat occupancy criteria. If so, what should the criteria be? First, what type of occupants should the criteria be based on; e.g., should they be based on a mid-size male, small-size female, or a child? Should the system be required to register small children that would presumably be placed in a child restraint system? Should the criteria take into account the presence of child restraint systems?

Next, for the type(s) of occupants upon which the criteria are based, what should the criteria be? Should NHTSA consider the same seat occupancy criteria specified in FMVSS No. 208 for compliance testing of low-risk deployment and suppression air bag systems? To test whether an air bag system either suppresses or properly deploys the front outboard passenger air bag in the presence of a child or small-stature individual, NHTSA tests the air bag system with a variety of different dummies. For example, for the static suppression and low-risk deployment compliance options, FMVSS No. 208 specifies multiple performance tests using 1-, 3-, and 6-year-old Anthropomorphic Test Devices (test dummies) both in and out of a Child Restraint System (CRS). In addition, in order to ensure that the suppression

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<sup>74</sup> S7.3(c).

feature does not inappropriately suppress the air bag for small-statured adults, FMVSS No. 208 requires the air bag system to be active during several static tests using a 5th percentile adult female dummy in the right front passenger seat.

In order to perform compliance testing on a rear seat belt warning system that uses occupant detection, should NHTSA use one or more of these dummies, or specify occupancy conditions based on one of these dummies? For example, NHTSA could specify use of the 6-year-old test dummy. Alternatively (or in addition), NHTSA could specify that a rear seat would be considered “occupied” when an occupant who weighs at least 21 kg (46.5 lb), and is at least 114 cm (45 in) tall is seated there. These measurements come from FMVSS No. 208, S29.1(e), and correspond to the height and weight requirements for a child who is used as an alternative for the 6-year-old child test dummy for compliance testing of advanced air bag systems utilizing static suppression. Is this an appropriate threshold? NHTSA also seeks comment on the potential for false warnings, and how this might be addressed.

8. *Making the system resistant to intentional and inadvertent defeat.* As part of the agency’s seat belt interlock research program, we recently performed research on the development of a seat belt misuse detection system,<sup>75</sup> so we are aware there are a number of ways in which a rear seat belt warning system might be intentionally defeated, as well as potential countermeasures. For example, a warning system could be defeated if:

- The belt was buckled before the occupant sat in the seat. This could be addressed by requiring a sequential logic system. A sequential logic system would require that the

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<sup>75</sup> Mazzae, E. N., Baldwin, G. H. S., & Andrella, A. T. (2018, October). Performance assessment of prototype seat belt misuse detection system (Report No. DOT HS 812 593). Washington, DC: National Highway Traffic Safety Administration.

belt be buckled after the seat has been occupied in order for the system to recognize the seat belt as being buckled;

- An occupant buckles the seat belt behind themselves. This could be addressed by utilizing seat belt buckle and spool-out sensors and deactivating the warning only if the webbing were spooled out more than a predetermined length. However, even these sensors could be defeated by pulling out additional webbing and clipping it off to prevent retraction; or
- The seat belt and/or occupant detection sensors utilized by the rear warning system in vehicles with removable rear seats are intentionally disconnected.

There are also scenarios involving inadvertent circumvention that could impact the effectiveness and accuracy of a rear belt warning system. One scenario is when the driver uses a remote engine starter so that the initial warning activates before the driver (and perhaps the rear seat occupants) are in the vehicle. This might be addressed by programming the system to require input from door or occupant sensors to verify that the driver is in the vehicle. There are, of course, a variety of other ways the warning system might be intentionally or inadvertently circumvented.

We seek comment on whether NHTSA should propose requirements to address circumvention. We also seek comment on whether we should propose requiring a single-trip manual deactivation of the seat belt warning system once the minimal signal performance requirements are met, which might diminish the likelihood of circumvention.<sup>76</sup> The ECE regulations allow the rear seat belt warning system to incorporate a short-term and/or a long-

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<sup>76</sup> A single-trip manual activation refers to a feature that allows the driver to acknowledge a visual or audio signal—*e.g.*, with a press of a button—and not continue seeing or hearing it.



term deactivation feature for the audible change-of-status warning.<sup>77</sup> Under these regulations, a short-term deactivation may only be effectuated by specific controls that are not integrated in the safety-belt buckle and only when the vehicle is stationary.<sup>78</sup> When the ignition or master control switch is deactivated for more than 30 minutes and activated again, a short-term deactivated safety-belt reminder must reactivate. A long-term deactivation may only be effectuated by a sequence of operations that are detailed only in the manufacturer's technical manual or which require tools that are not provided with the vehicle.<sup>79</sup> To what extent would a deactivation feature reduce the effectiveness of the warning? Would a deactivation feature only be needed for systems with a persistent audible warning?

9. *Electrical Connection Requirements.* A rear seat belt warning system might require an electrical connection between the seat and the vehicle to relay the information gathered by a buckle or webbing spool-out sensor to the rest of the warning system. A rear-belt warning system may therefore present potential wiring complexities, particularly in vehicles with removable, folding, rotating, or stowable seats. These types of seats might present an issue for a rear seat belt warning system because the electrical connection might not be reestablished for these seats when the seat is reinstalled. There could be instances for manual connection seats where the driver either forgets to make the connection or makes an improper connection. Even for seats where the connections are automatically established when the seat is reinstalled, the automatic connectors might malfunction and a proper connection may not be made. If the electrical connection is not reestablished, the warning system could malfunction or provide inaccurate information. This issue might predominantly affect

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<sup>77</sup> § 8.4.5.

<sup>78</sup> § 8.4.5.1.

<sup>79</sup> § 8.4.5.2.

minivans, which make up a small percentage of the fleet. Removable seats are mainly found in the second row of minivans. Foldable, rotating or otherwise stowable seats (*e.g.*, Stow-n-Go, Flip and Fold) are prominent in the third row of minivans or large sport utility vehicles. Foldable or stowable seats in the second row are not as prominent in minivans.

A variety of potential system requirements could be proposed to address this potential issue. The warning system in such vehicles might be required to automatically connect the electrical connections when the seat is put in place or, if a manual electrical connection is required, the connectors might be required to be readily accessible. The system could also provide a warning signal to inform the driver if a proper electrical connection has not been made with respect to an easily removable seat. Euro NCAP and the revised ECE regulations do not have such specifications. The ECE regulations provide that the rear seat belt warning requirements will not apply to removable rear seats or to seats in a row in which there is a suspension seat until September 2022.

NHTSA seeks comment on this issue, particularly on whether such electrical connection requirements should be proposed, and if so what they should be, and what types of seats they should be required for. Are there new and innovative wireless technologies that could reduce or eliminate wiring complexities, such as those used in tire pressure monitoring systems? The agency also seeks comment on the safety need for such warnings and the costs and feasibility of addressing these issues.

10. *Owner's manual/label requirements.* We also seek comment on whether NHTSA should propose that information be provided in the vehicle owner's manual that accurately describes the warning system's features, including the location and format of the visual warnings, in an easily understandable format. Information of this sort is already required by FMVSS No.

208 for the driver's seat belt warning. Owner's manual readership may be relatively low,<sup>80</sup> so we also seek comment on whether we should require that this information be displayed in the vehicle instead of (or in addition to) the owner's manual. Should information about the reconnection of electrical components for any removable/stowable seats be placed in close proximity to the seat's electrical connection?

11. *Interaction with other vehicle warnings.* NHTSA also seeks comment on whether a rear seat belt warning could conflict with other in-vehicle warnings. We seek comment on how NHTSA might specify warning requirements so that any such conflicts are avoided or minimized, and, if a conflict cannot be avoided, which warning, if any, should take precedence.

12. *Harmonization with regulatory requirements or new car assessment programs in other markets.* NHTSA also seeks comment on whether and to what extent any proposed requirements might (or should) be based upon or differ from other regulatory requirements (such as ECE requirements) or consumer information programs (such as Euro NCAP).

With respect to potential requirements for a visual rear seat belt warning, NHTSA seeks comment on the following:

13. *Visual warning location.* Who should the signal warn—the driver, the rear passenger(s), or both? A seat belt warning can function either by alerting the driver that a rear seat belt is unbuckled, leaving it to the driver to request the rear passenger to buckle up; it can warn the rear passenger(s) directly that their belt is unbuckled; or it can warn both the driver and rear passenger(s). Some research may suggest that having the warning visible to the unbelted

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<sup>80</sup> The National Child Restraint Use Special Study found that only 13 percent of drivers reported reading the vehicle owner's manual. Nathan K. Greenwell. 2015. DOT HS 812 142. Washington, DC: U.S. Department of Transportation, National Highway Traffic Safety Administration, p. 10.

occupant may increase effectiveness.<sup>81</sup> The new ECE regulation simply requires that the visual warning be visible to the driver when they are facing forward.<sup>82</sup> NHTSA seeks comment on whether the warning should be visible to the driver, the rear passenger(s), or both. To what extent would requiring a warning be visible to rear passengers increase cost and complexity, and would this be justified? Where should the visual warning be located, especially with respect to the rear passenger, if such a telltale were appropriate? To what extent would or should such requirements constrain manufacturers' design choices, and how could such constraints be minimized?

14. *What type of information should the warning convey?* Particularly with respect to a visual warning for the driver, what type of information should a visual warning convey? For example, the system could indicate how many or which rear seat belts are in use (a “positive-only” system); how many or which rear seat belts are not in use (a “negative-only” system); or how many or which rear seat belts are in use and how many or which rear seat belts are not in use (a “full-status” system).

Each of these systems could have strengths and limitations. A positive-only system would be the least technically complex of the three. Since it would only need to detect whether a seat belt is in use, it would require seat belt latch or webbing spool-out sensors (assuming no defeat sensing was required). With a positive-only system, the driver would need to determine how many rear seat occupants there are and then determine if that number equals the number of seat belts that are reported by the warning system as buckled. This compliance option would not necessitate occupant detection.

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<sup>81</sup> DOT 2007 Acceptability Study, *supra*, pp. 67-68.

<sup>82</sup> ECE Regulation No. 16, Revision 9 § 8.4.4.2.

Negative-only and full-status systems would provide more direct information to the driver, but might be more technically complex. These systems might be more effective than a positive-only system because they would directly inform the driver whether any rear seat occupants were unbuckled, without the driver having to compare the number or location of occupants and fastened belts. In addition, as discussed above, warning systems equipped with occupant detection are more amenable to audible warnings and enhanced warning features. However, such systems might require occupant detection sensors in order to minimize or eliminate false warnings. (Because the negative-only and full-status systems would indicate the presence of an unbuckled belt, they would probably want to avoid giving this warning unless the seat were occupied; if not, such “false positives” could lead the driver to disregard the warning or circumvent the system.)

NHTSA seeks comment on the relative merits of such systems. Should NHTSA propose one or more of these systems as requirements or compliance options? How much more effective would the more informative negative-only and full-status systems be? How much more complex or expensive would they be? Would occupant detection be necessary for these systems? NHTSA also seeks comment on whether there are alternative warning systems that would convey alternative or additional information to the driver (or rear passengers). For example, would a less sophisticated warning, such as a specialized system of mirrors, be sufficient to inform the driver about the status of the rear seat belts?

15. *Telltale Characteristics.* If a visual warning system including a telltale were to be required, should NHTSA propose requirements for telltale characteristics, and if so, what should they be? Should the warning be standardized, and would this increase the likelihood that consumers would notice, recognize, and respond to the warnings? For example, should

NHTSA propose requirements for the color of the telltale, required text, pictorial vs. alphanumeric, or whether it flashes?

16. *Minimum duration.* What should the minimum duration of a visual warning be? The current driver's seat belt visual warning is required to last at least 60 seconds under the second compliance option. What minimum length of time would be sufficient to capture the driver's (or passenger's) attention for the rear seat belt warning, without becoming a distraction or nuisance for the driver (or passenger)? NHTSA's research (for front seat belt warnings) suggests that longer-duration warnings are more effective, but also more annoying.<sup>83</sup> Euro NCAP specifies at least a 90 second visual signal for the front seats and only a 60 second visual signal for the rear seats in order to earn bonus points. The new ECE regulation specifies a first level 30 second visual warning and second level 30 second audiovisual warning for the front seats and a 60 second visual signal for the rear seats.

With respect to audible warnings, we seek comment on the following:

17. *Minimum duration.* If an audible warning requirement were adopted for the change-of-status warning, what should the minimum duration of an audible warning be? Because MAP-21 removed the 8-second limitation, NHTSA may require longer-lasting audible warnings. NHTSA is, however, cognizant of the fact that longer warnings lead to annoyance. What duration would appropriately balance effectiveness and annoyance? Euro NCAP specifies that a change-of-status audible warning must be 30 seconds long in order to receive bonus points.<sup>84</sup> The new ECE regulation also specifies that a change-of-status audible warning component be 30 seconds long.<sup>85</sup>

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<sup>83</sup> DOT 2009 Belt Warning Study, *supra*, p. 57.

<sup>84</sup> European New Car Assessment Programme Assessment Protocol – Safety Assist, § 3.3.2

<sup>85</sup> ECE Regulation No. 16, Revision 9 § 8.4.2.4.1.

18. *Other audible signal characteristics.* If it mandates an audible warning, should NHTSA specify any additional audible warning characteristics (for example, a minimum/maximum sound level)?

### **B. Applicability**

19. NHTSA seeks comment on the vehicles to which any proposed rear seat belt warning requirements should apply. We also seek comment on whether any vehicles within the broad applicability criteria should be exempt. Rear seat belts are generally required except in certain buses (such as school buses) between 10,000 lb and 26,000 lb, and for school, perimeter, and transit buses over 26,000 lb. (Other exceptions also apply.) We especially seek comment on whether a rear seat belt warning should be required for high-occupancy vehicles such as 15-passenger vans, large sport utility vehicles, school buses, and large trucks and vans with a GVWR less than or equal to 4,536 kg (10,000 lb).<sup>86</sup>

Vehicles with a larger number of rear seats may present visual signal complexities and other challenges. At the same time, such vehicles could be at least as likely, if not more likely, to have rear occupants. With respect to school buses, we acknowledge that a rear seat belt warning requirement might place additional cost burdens on school systems, given that such cost can lead to reductions in school bus service, resulting in greater risk to students.<sup>87</sup> We also note that school buses of all sizes offer passengers compartmentalization protection to reduce the risk of crash injury, even to the unbelted.

We seek comment on what vehicle types should be included and excluded, including the costs and benefits of inclusion. We also seek comment on ways to propose performance

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<sup>86</sup> Fifteen-passenger vans are classified as “buses” because they are designed for carrying more than ten persons. *See* S571.3.

<sup>87</sup> *See* 76 FR 53102 (Aug. 25, 2011) (denial of a petition for rulemaking to mandate the installation of three-point seat belts for all seating positions on all school buses).

requirements that provide manufacturers with the flexibility to design a warning system that is appropriate for each vehicle type.

### **C. Effectiveness**

20. NHTSA seeks comment on the effectiveness of rear seat belt warning systems. NHTSA's research suggests that at least some unbelted rear seat occupants might be amenable to wearing a seat belt. Seat belt non-users are typically categorized as either "part-time" non-users or so-called "hard-core" non-users.<sup>88</sup> Part-time non-users are those non-users who generally express positive attitudes toward seat belts, but do not always buckle up, due to a range of reasons, such as short trips, forgetfulness, and being in a rush.<sup>89</sup> Hard-core non-users are those who "generally do not acknowledge the benefits of seat belts and are opposed to their use."<sup>90</sup> NHTSA's consumer research shows that part-time non-users make up the majority of non-users (83%), while hard-core non-users make up a smaller proportion of non-users (17%).<sup>91</sup> According to the results of NHTSA's most recent self-reporting survey of seat belt use, the Motor Vehicle Occupant Safety Survey (MVOSS), while more than four-fifths of survey respondents said they always wore their seat belts when driving (88%) or riding as a passenger in the front seat (86%), only 58 percent said they always wore their seat belts when riding as a passenger in the rear seat.<sup>92</sup> Even those who normally wore their seat

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<sup>88</sup> See, e.g., Transportation Research Board Study, *supra*, p. 3.

<sup>89</sup> John M. Boyle & Cheryl Lampkin. 2008. 2007 Motor Vehicle Occupant Safety Survey, Volume 2, Seat Belt Report. DOT HS 810 975. Washington, DC: U.S. Department of Transportation, National Highway Traffic Safety Administration; DOT 2009 Belt Warning Study, *supra*, p. 1.

<sup>90</sup> Transportation Research Board Study, *supra*, p. 40.

<sup>91</sup> Calculated from Boyle & Lampkin, *supra*, p. 11 (Fig. 6). This considers respondents who reported that they "Never" or "Rarely" used a seat belt to be hard-core nonusers. See Transportation Research Board Study, *supra*, p. 31 n.3. This does not include respondents who indicated that they never drive. The number of non-drivers surveyed was relatively small. Boyle & Lampkin, *supra*, p. 75.

<sup>92</sup> Boyle & Lampkin, *supra*, p. iv. This is a national telephone survey periodically conducted by NHTSA. Because, unlike NOPUS, it is not observational, the MVOSS is not the best indicator of national belt use. In addition, because of respondent bias, the large number of part time users, and the tendency for survey respondents to over-report belt use, MVOSS use rates have typically been about 10 percentage points higher than those from NOPUS.



belts in the front seat were less inclined to wear their seat belts in the rear. Only 66 percent of people who said they always wore seat belts while driving also said they always wore them as rear seat passengers. Of those who wore seat belts “most of the time” as drivers, only a small percentage said they wore them always (12%) or most of the time (21%) when riding in the rear.<sup>93</sup> These part-time non-users might be amenable to strategies to increase seat belt use.<sup>94</sup>

A rear seat belt warning system can increase rear seat belt use in two ways: it can remind a rear seat occupant to fasten his or her belt, and it can inform the driver that a passenger is unbuckled, so that the driver can request the occupant to fasten their belt. Without a rear seat belt warning, the driver must turn around to ascertain whether a rear seat occupant is using a seat belt (or ask the occupant); in some vehicles, belt use may not be evident to the driver, even if he or she turned around, due to line-of-sight limitations. In NHTSA’s 2015 Survey of Principal Drivers of Vehicles with a Rear Seat Belt Reminder System, 65 percent of drivers of vehicles equipped with rear seat belt reminders reported that the rear seat belt reminder made it easier to encourage the rear seat passengers to buckle up.<sup>95</sup>

NHTSA has conducted a variety of research relating to the effectiveness of in-vehicle seat belt warnings. First, it conducted the multi-phase seat belt warning study that was part of the research program initiated pursuant to SAFETEA-LU. The analysis demonstrated that

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MVOSS does, however, provide demographic detail that cannot be observed and insight into the reasons people do and do not use seat belts. See Donna Glassbrenner. 2002. Safety Belt and Helmet Use in 2002—Overall Results. DOT HS 809 500. Washington, DC: U.S. Department of Transportation, National Highway Traffic Safety Administration.

<sup>93</sup> Boyle & Lampkin, *supra*, p. 41.

<sup>94</sup> Transportation Research Board Study, *supra*, pp. 39-40, 61; Boyle & Lampkin, *supra*, pp. 36, 38.

<sup>95</sup> Paul Schroeder & Melanie Wilbur. 2015. Survey of Principal Drivers of Vehicles with a Rear Seat Belt Reminder System. Washington, DC: National Highway Traffic Safety Administration, p. 47. [Found in the docket for this ANPRM.]

the presence of an enhanced front seat belt reminder system increased front outboard passenger seat belt use by about 3 to 4 percentage points more than in vehicles with only a driver seat belt warning system meeting the minimum requirements in S7.3.<sup>96</sup>

Second, NHTSA's 2015 Survey of Principal Drivers of Vehicles with a Rear Seat Belt Reminder System studied the effectiveness and acceptability of rear seat belt warnings based on a consumer telephone survey of the drivers of vehicles with and without rear seat belt warning systems.<sup>97</sup> The study found, among other things, that about one quarter of drivers (24%) of vehicles equipped with a rear seat belt warning system noticed an increase in rear seat belt use. When asked about their experience with the change of seat belt buckle status alert, close to half of drivers of vehicles with a rear seat belt warning system (49%) said that their system has indicated that a passenger had unfastened his/her seat belt within the past year. Overall, of those who reported experiencing a change of seat belt status alert (49%), over three-quarters of these drivers (77%) said that the unbuckled passenger eventually did refasten her seat belt, either on her own or at the driver's request.

NHTSA seeks comment on whether, and to what degree, a rear seat belt warning would be effective. We seek comment on specific warning signal attributes that NHTSA could propose (*e.g.*, duration of an audible warning), and how effective they might be, especially as compared to other possible signal attributes.

We also seek comment on how to quantify the effectiveness of a rear seat belt warning system, including data related to this. Because of the low prevalence and limited history with rear seat belt warnings, NHTSA has limited direct data on the effectiveness of

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<sup>96</sup> DOT 2009 Belt Warning Study, *supra*, p. 21.

<sup>97</sup> Paul Schroeder & Melanie Wilbur, Survey of Principal Drivers of Vehicles with a Rear Seat Belt Reminder System. Washington, DC: National Highway Traffic Safety Administration (2015). [Found in the docket for this ANPRM.]

rear seat belt warnings. Can we expect more or less of an increase than the 3-4% increase for enhanced front warnings? NHTSA requests any data or studies concerning the effectiveness of rear seat belt warnings. We also seek comment on balancing effectiveness with costs, technological feasibility, and acceptability.

With respect to comments that identify an innovative seat belt warning system differing from the current driver's seat belt warning and current production front and rear passenger seat belt warnings, NHTSA seeks comment on such possibilities, and the effectiveness of any such alternative.

#### **D. Consumer Acceptance**

21. NHTSA seeks comment on potential consumer acceptance concerns with a proposed seat belt warning system.

In order for a rear seat belt warning to have an impact on seat belt use, it must balance effectiveness with acceptability. The warning must be noticeable enough to prompt occupants to buckle their seat belts, but not so intrusive that the public does not accept the warning system, that an occupant will circumvent or disable it, or that the warning system could lead to driver distraction that could increase the risk of a crash.<sup>98</sup>

Consumer acceptance of any eventual seat belt warning requirements is an important consideration, given the potential safety benefits of rear seat belt warnings, the history of seat belt warning technologies, and the fact that consumers have not yet had widespread exposure to rear seat belt warnings.

The 2004 Transportation Research Board Report on technologies to increase seat belt use observed that, while limited, “the data available to date provide strongly converging

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<sup>98</sup> DOT 2009 Belt Warning Study, *supra*, p. 2; Transportation Research Board Study, *supra*, p. 8.

evidence in support of both the potential effectiveness and consumer acceptance of many new seat belt use technologies[.]”<sup>99</sup> As part of the research for the report, NHTSA conducted a limited number of focus group interviews with part-time and hard-core non-users. The report noted that “many part-time users interviewed by NHTSA—the primary target group for the technology—were receptive to the new systems. Nearly two-thirds rated the reminders “acceptable,” and approximately 80 percent thought that they would be “effective.”<sup>100</sup>

NHTSA’s 2015 Survey of Principal Drivers of Vehicles with a Rear Seat Belt Reminder System also investigated the acceptability of rear seat belt warning systems. NHTSA surveyed (by telephone) drivers of vehicles with and without a rear seat belt warning system.<sup>101</sup> The rear warning systems in these vehicles had a visual warning on start-up and an audio-visual change of status warning. The study found, among other things, that 81 percent of drivers of vehicles with a rear seat belt warning were “very satisfied” with the system warning at the beginning of a trip; less than 2 percent were dissatisfied. Seventy-eight percent of drivers were satisfied with the change-of-status warning during a trip; about 1 percent were dissatisfied. Among drivers of vehicles without a rear seat belt warning, attitudes towards rear belt warnings were generally positive as well: a majority (55%) indicated that it was important to them that their next vehicle be equipped with a rear belt warning system.

NHTSA seeks comment on what types of rear seat belt warnings consumers would accept. NHTSA seeks comment on specifications that would maximize effectiveness while

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<sup>99</sup> Transportation Research Board Study, *supra*, pp. 75-76.

<sup>100</sup> *Id.* p. 10.

<sup>101</sup> The vehicles with seat belt warning systems were Volvos and certain Cadillac and Chevrolet models.

still being acceptable to the public, as well as the potential for intrusive warnings to lead to driver distraction. NHTSA also seeks comment on how the potential for false positives can be minimized (because false positives can lead occupants to ignore or circumvent the warnings, or lead to driver distraction). NHTSA also seeks comment on the results of the 2015 survey, including whether and to what extent, selection bias might influence the results.

#### **E. Technological and Economic Feasibility**

22. NHTSA also seeks comment on the technological and economic feasibility of alternative rear seat belt warning systems.

We seek comment on the technological and economic challenges that might be posed by different types of warning systems, including the type of equipment and re-design they might necessitate. Seat belt latch and webbing spool-out sensors are already used by many manufacturers to comply with the existing driver seat belt requirements. We are aware that implementing a visual warning may require physical redesign of the instrument panel. Such redesign would have to take into account visibility, interaction with existing signals and displays, available space on the instrument panel, and effectiveness, as well as other factors. In some instances, a visual signal might be displayed as a telltale on the instrument panel or on the vehicle's information display screen. Manufacturers would also have to determine whether driver and rear passenger seat belt warning visual signals would be treated the same. Occupant detection might present technological challenges, but would probably not be necessary for a positive-only warning system. We recognize that larger vehicles with many rear designated seating positions may present challenges. We seek comment on these concerns, as well as other concerns.

We also seek comment about whether a rear seat belt warning would reliably detect a child restraint system attached by a child restraint anchorage system, or LATCH.<sup>102</sup>

#### **F. Benefits and Costs**

23. The agency has presented a wide variety of different potential alert systems, all with different cost and effectiveness profiles, and is not at this time conducting a cost-benefit analysis on any particular approach. However, many of the technologies discussed in this ANPRM are currently in use, either for front seat passengers or, in more limited models, rear seat passengers. NHTSA, therefore, seeks comment on the potential benefits and costs of the different types of rear seat belt warning system discussed in this notice, including those that provide a warning similar to the kinds of seat belt warnings that are provided in current-production vehicles in the United States or elsewhere in the world, as well as other potentially novel approaches.

#### **G. Safety Act Criteria**

24. MAP-21 instructs NHTSA to initiate a rulemaking proceeding for a rear seat belt warning system and to issue a final rule if it would meet the requirements in section 30111 of the Safety Act. NHTSA seeks comment on whether a proposed rear seat belt warning system would meet the requirements and considerations of 49 U.S.C. 30111.

#### **H. Non-Regulatory Alternatives**

25. If commenters believe that a proposed seat belt warning system would not meet the requirements and considerations of 49 USC 30111, NHTSA seeks comment on whether it should consider any non-regulatory approaches to address this issue.

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<sup>102</sup> Many in the child passenger safety community refer to the child restraint anchorage system as the “LATCH” system, an abbreviation of the phrase “Lower Anchors and Tethers for Children.” The term was developed by a group of manufacturers and retailers for use in educating consumers on the availability and use of the anchorage system and for marketing purposes.

For example, NHTSA might provide recognition through NCAP for vehicles equipped with a rear seat belt warning system. Other international NCAP programs, including Euro NCAP, Japan's New Car Assessment Program (J-NCAP), China NCAP (C-NCAP), Latin NCAP, New Car Assessment Program for Southeast Asia (ASEAN NCAP), Korean NCAP (KNCAP), and Australasian New Car Assessment Program (ANCAP), award bonus points to vehicles that are equipped with seat belt warning systems for passenger seating positions. NHTSA could potentially establish criteria in NCAP for rear seat belt warning systems as it does for other vehicle safety features. For example, NCAP evaluates the ability of an automatic emergency braking system to detect the presence of a vehicle and initiate braking without driver interaction in several different scenarios (*e.g.*, lead vehicle slowing, lead vehicle stopped).

NHTSA could also issue voluntary guidelines for manufacturers. The guidelines could identify best practices for manufacturers who wish to equip vehicles with a rear seat belt warning system. The best practices could include the type of information the warning system should convey and the minimum durations of the warnings. NHTSA also seeks comment on whether there would be any other non-regulatory approaches that would be appropriate.

#### **I. Removing the Driver's Seat Belt Warning Audible Signal Duration Upper Limit**

26. NHTSA also seeks comment on removing the driver's seat belt warning audible signal duration upper limit.

FMVSS No. 208 currently requires a driver's seat belt warning with an audible warning lasting between four and eight seconds. Prior to the enactment of MAP-21, the agency could not require the audible warning to operate for more than 8 seconds. As discussed above, Congress enacted this restriction in 1974. The sole basis for the 8-second maximum duration in FMVSS

No. 208 is this statutory limitation. In light of Congress's repeal of this restriction, NHTSA seeks comment on removing the corresponding provision in FMVSS No. 208.

Although NHTSA did not previously have the authority to require, or specify as a compliance option, a seat belt warning with an audible signal lasting more than 8 seconds, the agency facilitated the voluntary adoption of enhanced warnings through a series of legal interpretations that determined that the Safety Act did not prohibit manufacturers from using enhanced warning systems (*e.g.*, systems with audible warnings that lasted more than 8 seconds) as long as the manufacturer differentiated the voluntarily-provided signal from the required signal (for example, by a clearly distinguishable lapse in time between the two signals).

Amending FMVSS No. 208 by removing the 8-second limitation would eliminate the need to differentiate between signals and give vehicle manufacturers greater flexibility in designing their seat belt warning systems. It would not affect the minimum required duration for the audible signal (4 seconds) and would not require manufacturers to make any changes to their existing seat belt warnings that comply with the existing requirements of FMVSS No. 208.

We seek comment on this.

## **VII. Regulatory Notices**

This action has been determined to be significant under Executive Order 12866, as amended by Executive Order 13563, and the Department of Transportation (DOT) Order 2100.6, "Policies and Procedures for Rulemakings." It has been reviewed by the Office of Management and Budget under Executive Order 12866. Executive Orders 12866 (Regulatory Planning and Review) and 13563 (Improving Regulation and Regulatory Review) require agencies to regulate in the "most cost-effective manner," to make a "reasoned determination that the benefits of the intended regulation justify its costs," and to develop regulations that "impose the least burden on



society.” Additionally, Executive Orders 12866 and 13563 require agencies to provide a meaningful opportunity for public participation. We have asked commenters to answer a variety of questions to elicit practical information about alternative approaches and relevant technical data. Further, in accordance with DOT Order 2100.6, NHTSA has determined that this rulemaking, should it lead to a mandate of rear seat belt systems, would qualify as an “economically significant rule,” as it would likely impose a total annual cost greater than \$100 million; accordingly, NHTSA is using this ANPRM to solicit public feedback before proceeding with a proposed rule. This action is not subject to the requirements of E.O. 13771 (82 FR 9339 (Feb. 3, 2017)) because it is an advance notice of proposed rulemaking.

## **VIII. Public Comment**

### **How do I prepare and submit comments?**

- To ensure that your comments are correctly filed in the Docket, please include the Docket Number found in the heading of this document in your comments.
- Your comments must not be more than 15 pages long.<sup>103</sup> NHTSA established this limit to encourage you to write your primary comments in a concise fashion. However, you may attach necessary additional documents to your comments, and there is no limit on the length of the attachments.
- Please organize your comments so they appear in the same order as the topics to which they respond appear in this document. Please identify comments by the number with which the relevant topic is associated in this document.

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<sup>103</sup> 49 CFR 553.21

- If you are submitting comments electronically as a PDF (Adobe) file, NHTSA asks that the documents be submitted using the Optical Character Recognition (OCR) process, thus allowing NHTSA to search and copy certain portions of your submissions.
- Please note that pursuant to the Data Quality Act, in order for substantive data to be relied on and used by NHTSA, it must meet the information quality standards set forth in the OMB and DOT Data Quality Act guidelines. Accordingly, NHTSA encourages you to consult the guidelines in preparing your comments. DOT's guidelines may be accessed at <https://www.transportation.gov/regulations/dot-information-dissemination-quality-guidelines>.

### **Tips for Preparing Your Comments:**

When submitting comments, please remember to:

- Identify the rulemaking by docket number and other identifying information (subject heading, Federal Register date and page number).
- Explain why you agree or disagree, suggest alternatives, and substitute language for your requested changes.
- Describe any assumptions you make and provide any technical information and/or data that you used.
- If you estimate potential costs or burdens, explain how you arrived at your estimate in sufficient detail to allow for it to be reproduced.
- Provide specific examples to illustrate your concerns, and suggest alternatives.
- Explain your views as clearly as possible, avoiding the use of profanity or personal threats.
- To ensure that your comments are considered by the agency, make sure to submit them by the comment period deadline identified in the DATES section above.

For additional guidance on submitting effective comments, visit:

[https://www.regulations.gov/docs/Tips\\_For\\_Submitting\\_Effective\\_Comments.pdf](https://www.regulations.gov/docs/Tips_For_Submitting_Effective_Comments.pdf).

**How can I be sure that my comments were received?**

If you wish Docket Management to notify you upon its receipt of your comments, enclose a self-addressed, stamped postcard in the envelope containing your comments. Upon receiving your comments, Docket Management will return the postcard by mail.

**How do I submit confidential business information?**

If you wish to submit any information under a claim of confidentiality, you should submit three copies of your complete submission, including the information you claim to be confidential business information, to the Chief Counsel, NHTSA, at the address given above under FOR FURTHER INFORMATION CONTACT. In addition, you should submit a copy, from which you have deleted the claimed confidential business information, to the docket at the address given above under ADDRESSES. When you send a comment containing information claimed to be confidential business information, you should include a cover letter setting forth the information specified in our confidential business information regulation. (49 CFR part 512)

**Will the agency consider late comments?**

We will consider all comments received before the close of business on the comment closing date indicated above under DATES. To the extent possible, we will also consider comments that the docket receives after that date. If the docket receives a comment too late for us to consider in developing a final rule (assuming that one is issued), we will consider that comment as an informal suggestion for future rulemaking action.

**How can I read the comments submitted by other people?**

You may read the comments received by the docket at the address given above under ADDRESSES. The hours of the docket are indicated above in the same location. You may also see the comments on the Internet. To read the comments on the Internet, go to <http://www.regulations.gov>. Follow the online instructions for accessing the dockets.

Please note that even after the comment closing date, we will continue to file relevant information in the docket as it becomes available. Further, some people may submit late comments. Accordingly, we recommend that you periodically check the Docket for new material. You can arrange with the docket to be notified when others file comments in the docket. See [www.regulations.gov](http://www.regulations.gov) for more information.

Issued on \_\_\_\_\_ in Washington, D.C., under authority delegated in 49 CFR 1.95 and 501.5.

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**James Clayton Owens**  
Acting Administrator

Billing Code: 4910-59-P