August 2, 2021

Dr. Steven Cliff
Acting Administrator
National Highway Traffic Safety Administration
1200 New Jersey Avenue, S.E.
Washington, D.C. 20590

RE: Notice of Proposed Rulemaking (NPRM); Occupant Crash Protection, NHTSA Docket No. 2020-0094, 85 Fed. Reg. 68541 (October 29, 2020)

Dear Acting Administrator Cliff:

On October 29, 2020, the National Highway Traffic Administration issued a Notice of Proposed Rulemaking ("NPRM") to amend FMVSS 208 to update the list of Child Restraint Systems ("CRS") used to evaluate occupant protection for child occupants seated in a CRS installed in the right-front passenger seat. In addition to the comments previously submitted to the docket in response to this notice, the Alliance for Automotive Innovation ("Auto Innovators") respectfully submits the following supplemental comments in support of reconsideration of certain CRS selected for inclusion in the appendix, and to request an extension of the compliance dates listed in the proposed final rule.[1] Additionally, we request that the agency conduct further analysis on the regulatory impact of including heavier CRS in Appendix A-1, as it relates to both existing and future vehicle designs.

In principle, Auto Innovators is supportive of agency efforts to update the list of CRS included in Appendix A-1. This helps better ensure that the CRS used for compliance testing can be more easily acquired when compared with older models that may be discontinued. However, we remain concerned that the agency's proposed updates to the list of CRS used for advanced airbag testing does not sufficiently consider the potential misclassification of smaller stature occupants seated in the right-front seating position. In addition, the proposal does not fully assess the regulatory impact of changes to the appendix on existing vehicle designs, including limitations on the options available for manufacturers in demonstrating compliance with the standard.

[1] The Alliance for Automotive Innovation represents the manufacturers producing nearly 99 percent of cars and light trucks sold in the U.S. Its members are listed as follows: Aisin Group, APTIV, Argo AI, BMW Group, Bosch, Byton, Cruise, Denso, Ferrari, Ford, GM, HARMAN, Honda, Hyundai, Infineon, Intel, Isuzu, Jaguar Land Rover, Karma, Kia, Local Motors, Luminar, Mazda, Mercedes-Benz, Mitsubishi Motors, Nissan, NXP, Panasonic, Porsche, RV Industry Association, Sirius XM, Stellantis, Subaru, Suzuki, Texas Instruments, Toyota, Volkswagen Group of America, and Volvo.

As noted in Auto Innovators comments in response to the NPRM:

> *We urge the agency to assure that its certification tests do not unintentionally increase the thresholds for air bag suppression/activation in a way that is inconsistent with overall occupant safety… The addition of heavier CRS to the FMVSS 208 Appendix would require manufacturers to take a series of steps. Substantial testing will be required to assess the performance of occupant classification systems with the heavier CRS installed. Such testing may identify the need for air bag system design changes. Changes to air bag size, shape, and inflators may necessitate changes to instrument panel design. Suppression may no longer be an option for some models with weight-based occupant classification sensors. Those models may have to switch from suppression to LRD approaches. In that case, the air bag module as well as the instrument panel may also need to be re-engineered. Significant changes may be required to accommodate the new systems. Our initial study indicates that, after further consideration of this matter by the affected parties and development of technical solutions, additional lead-time will likely be needed to implement these strategies, beyond what is proposed by the agency in the NPRM. This scenario will require full frontal crash development which typically takes more than two years.*

Expanding on these comments, in some cases, airbag suppression may still be possible, but not without extensive testing and re-design of the airbag suppression system. Depending on the complexity of the program (seat variants, trim series, etc.), the extent of testing and re-design of the airbag suppression system may approach the magnitude of airbag and instrument panel redesign. These challenges were outlined in detail in the presentation that Auto Innovators previously provided to NHTSA.[2]

Today, Auto Innovators seeks to provide additional analysis related to each of these concerns and outlines recommendations for an appropriate path forward.

1. Request for extension of the proposed compliance date

In the NPRM, NHTSA has proposed in several sections that vehicles manufactured on or after [*DATE OF FIRST SEPTEMBER 1ST AFTER PUBLICATION OF FINAL RULE*] and/or before [*DATE OF SECOND SEPTEMBER 1ST AFTER PUBLICATION OF FINAL RULE*] shall comply with the requirements of the Standard using the updated list of CRS.[3]

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[2] NHTSA-2020-0094 (reflecting the association meeting with the the agency on March 4, 2021).

[3] See NPRM - 85 FR 68541 [S14.8, S14.8.1, S14.8.1(a), S14.8.1(b), Appendix A to 571.208, Appendix A-1 to 571.208]

As outlined in the sections below, we request that updates to Appendix A-1 include modern CRS designs not incorporate models that exceed the maximum weight of the heaviest CRS in each of the existing subparts. However, should the agency decide to proceed with the CRS currently proposed in the NPRM additional adequate, lead time will be necessary. As a result of the selection of "exceptionally large" CRS included in the proposed Appendix A-1, we request that the proposed compliance dates in the NPRM be extended by at least two years, with an additional four-year phase-in. This will provide adequate lead time for manufacturers to evaluate and implement any necessary design changes related to air bag size, shape, and inflators, as well as other potential changes to the instrument panel design.

Auto Innovators further requests that should the agency issue a final rule to update Appendix A-1 prior to August 31, 2021, that the rule be updated to require compliance no sooner than August 31, 2023, with a final phase-in year no sooner than September 1, 2027.

In Subpart A through D of the proposed updates to Appendix A-1, NHTSA states that certain CRS "manufactured on or after [*Date of publication of final rule*], may be used by the National Highway Traffic Safety Administration to test the suppression or low risk deployment ("LRD") system of a vehicle that has been certified as being in compliance" with various sections of the standard (depending upon the respective CRS listed in the corresponding Subpart). Given our request to require compliance no sooner that August 31, 2023, it may not be suitable for the agency to begin using the updated CRS immediately upon publication of the final rule as manufacturers may require additional lead time to evaluate and implement necessary design changes. However, it is also important that optional early compliance be permitted to facilitate usage of the updated CRS prior to the required compliance date and final phase-in. Therefore, to ensure consistency within the regulation, we propose NHTSA only use the updated CRS to test the suppression or LRD system of a vehicle when a manufacturer has opted to use the updated CRS for certification. In other words, if the agency proceeds with its proposal to include exceptionally large CRS, manufacturers should have the option to demonstrate compliance using either the existing CRS or the updated list prior to the required compliance date and final phase-in.

2. Reconsideration of proposed updates to Appendix A-1

In addition to lead time concerns, Auto Innovators remains concerned with the potential impact of design changes to overall occupant safety in the right-front seating position as a result of updates to Appendix A-1. As previously indicated, the proposed updates to the CRS list will require substantial testing to assess the performance of occupant classification systems with the heavier CRS installed.

Progress in Reducing Airbag Related Fatalities in Front Seats

A Special Crash Investigation (SCI) report evaluated the effectiveness of numerous regulatory and policy actions designed to address initial airbag safety related concerns.[4] This included public awareness campaigns, airbag on-off switches, vehicle warning labels, sled-certification testing, and advanced airbag designs. The report noted that as of 2009, "significant declines in air-bag-related fatality counts continue to trend downward to a near-zero level," as shown in Figure 1.[4] The achievement was accomplished through a broad effort, including significant public awareness efforts to ensure children 12 and younger were seated in rear seating positions.

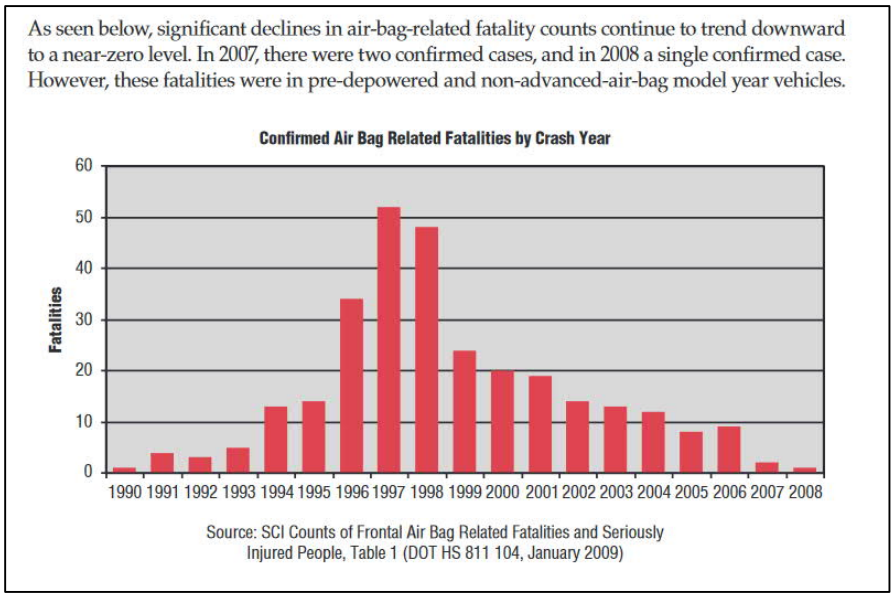

Figure 1: SCI Counts of Frontal Airbag Related Fatalities and Seriously injured People

Public awareness efforts to move children from front to rear seats have been tremendously successful. For example, data from the National Occupant Protection Use Survey (NOPUS) in Figure 2 and 3, below, shows the trends of rear seat placement of children under 8 between calendar year 2002 to 2019.[5,6] During this period, there was nearly a 20% increase in children under 8 who were in the rear seat.

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[4] SCI First Generation Frontal Airbags: A Model for Corrective Action, National Highway Traffic Safety Administration, DOT HS811 261, January 2010.

[5] Occupant Restraint Use in 2010: Results from the National Occupant Protection Use Survey Controlled Intersection Study, National Highway Traffic Administration, DOT HS 811 527, November 2011.

[6] Occupant Restraint Use in 2019: Results from the NOPUS Controlled Intersection Study, National Highway Traffic Administration, DOT HS 812 992, October 2020.

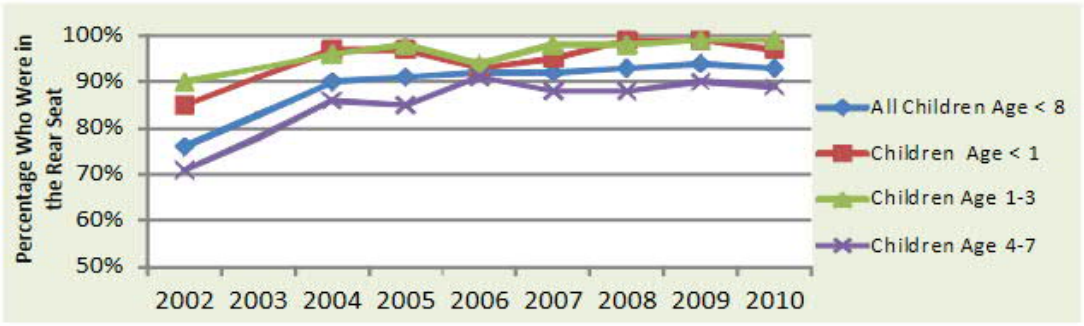

Figure 2: Child Rear Seat Placement (2002-2010) NOPUS Data

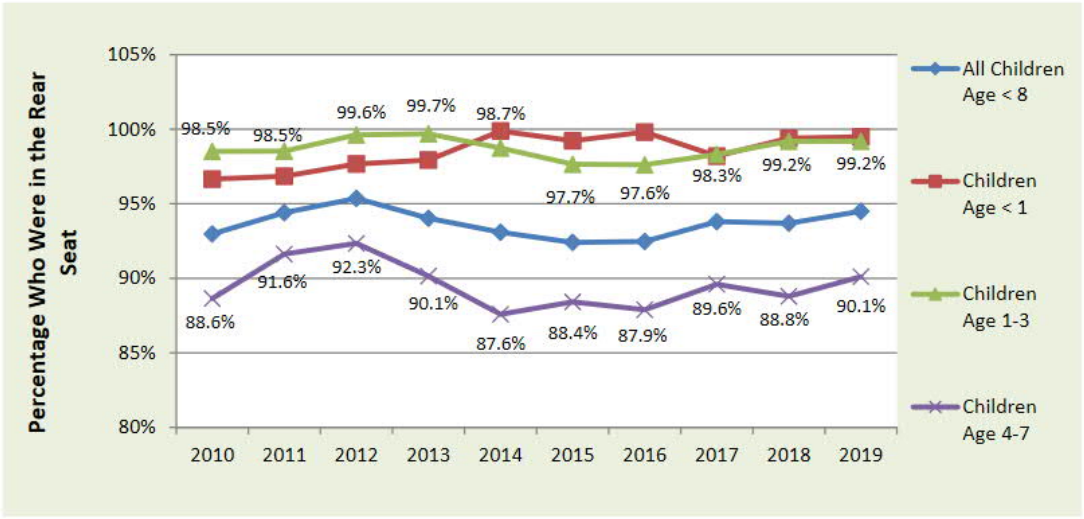

Figure 3: Child Rear Seat Placement (2010-2019) NOPUS Data

Additional data from the National Digital Car Seat Check Forum in Table 1, below, show the observed incidence of child occupants seated in a CRS in the right-front seating position (including more detailed information on the type of restraint system used).[7] While this data is not nationally representative, this further demonstrates the success in reducing the likelihood of child occupants seated in the front row seating position. This data also demonstrates that the population of child occupants in front seats and restrained in a CRS (which are subject to the advanced air bag requirements) is significantly limited compared to those that are restrained only by the seat belt.

[7] National Digital Car Seat Check Form Data - https://www.cpsboard.org/ndcf/ (Car seats observed in the NDCF before March 1, 2021, where both seating position and seat type on arrival were completed).

Seat Type	3rd/4th row			2nd row/Back			Front row		Total seats	% in front row
	Driver	Middle	Pass	Driver	Middle	Pass	Middle	Pass		
Backless Booster	5	-	3	31	6	22	-	-	67	0.0%
Base Only	9	3	1	152	148	418	2	2	735	0.5%
Belt Positioning Booster	94	12	81	375	93	422	-	7	1,084	0.6%
FF with Harness	175	37	138	1,474	406	1,821	3	9	4,063	0.3%
High Back Booster	6	2	4	24	6	38	-	-	80	0.0%
Lap Only Seat Belt	2	1	-	6	6	5	1	-	21	4.8%
Lap/Shoulder Seat Belt	36	14	29	110	59	140	-	10	398	2.5%
RF Convertible	59	6	31	964	618	2,029	1	8	3,716	0.2%
RF Only with Base	102	14	25	3,151	2,755	6,722	7	9	12,785	0.1%
RF Only without Base	19	2	3	310	163	356	3	4	860	0.8%
Other	8	1	8	43	12	56	-	-	128	0.0%
	515	92	323	6,640	4,272	12,029	17	49	23,937	0.3%

Table 1: Car seats observed in the NDCF before March 1, 2021, where both seating position and seat type on arrival were completed.

As a result of these significant achievements, NHTSA no longer provides routine reports on airbag fatality counts. In the absence of such investigative reports, we have analyzed data using the NHTSA Fatality and Injury Reporting System Tool (FIRST) to assess recent trends in right-front seat occupant fatalities in frontal crashes based on occupant age (see Figure 4).[8]

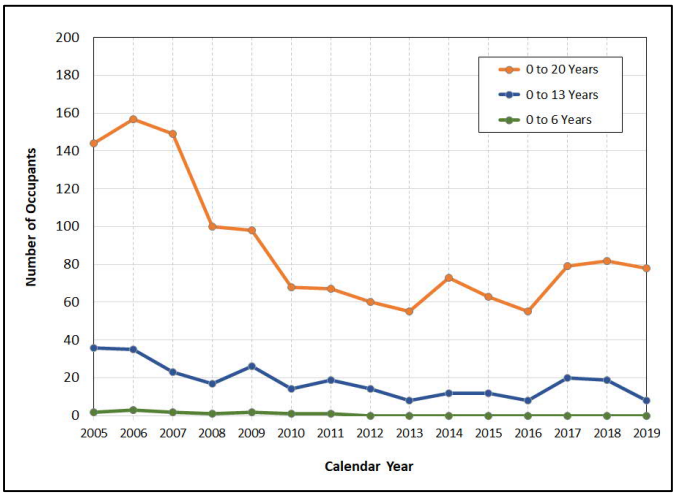

Figure 4: Occupants in Right Front Seat, Killed in Fatal Crashes, Total 2005-2019 CY (Head-On Collisions, Passenger Vehicle / Light Truck)

[8] National Highway Traffic Safety Administration (NHTSA) Motor Vehicle Crash Data Querying and Reporting, Occupants Involved in Motor Vehicle Crashes. Filter Selected: Manner of Collision: Head-On; Vehicle Body Type: Passenger Car or Light Truck - Pickup or Light Truck - Utility or Light Truck - Van or Light Truck - Other; Person Injury Type: Fatal; Person Type: Driver or Occupant; Seating Position: Front Seat, Right Side. Years:2005-2019 (https://cdan.dot.gov/query). Version 3.3.1 Release Mar 9, 2021.

Unlike the agency's prior airbag-related fatality investigations noted in the 2010 NHTSA SCI report, these data do not indicate the cause of the fatality or how the occupant was restrained. However, these data do suggest that, since being updated in 2008, the CRS list currently defined in FMVSS 208 Appendix A-1 has been successful in shaping design countermeasures that support a positive downward trend in injuries and fatalities for both child- and small-stature-occupants seated in the right-front seating position.

Concerns with Proposed Child Restraint Seats in the NPRM

The requirements of FMVSS 208 (including the equipment defined in the appendix) establish the thresholds that define how manufacturers consider the design of occupant protection and restraint systems for all occupants seated in the right-front seating position. More specifically, the weight of the CRS included in the appendix of the current rule, define the parameters that a manufacturer must base its design decisions upon, including which compliance option(s) are used to demonstrate adherence to the standard. This becomes increasingly relevant when considering the combined weight of certain CRS and child dummy occupants for certain configurations, where this combined weight may be comparable to the weight of smaller stature occupants. These points were illustrated in the Auto Innovators' initial comments.[9]

Today's advanced airbag suppression and low risk deployment systems continue to achieve the original intent of the advanced airbag rule, which is to limit the unintended consequences of airbag-related injuries and fatalities to both children and smaller-statured adults in the front seat. These systems have proven effective by demonstrating compliance with the CRS list that have been in place since 2008 (and are largely consistent in weight to CRS since the inception of the advanced airbag rule).

Auto Innovators is concerned the proposed increase in CRS weight will drive changes to these existing suppression and LRD systems. In addition to the downward trend of children in the front seats, data continues to demonstrate significantly higher occupancy rates for small statured occupants, including adults and larger children.

The graph in Figure 5, below, shows the total number of occupants seated in the right-front seat involved in a crash between 2005 and 2019 where there was a fatality.[10] The age range of occupants from 0 to 20 years is used as a proxy to demonstrate exposure differences between children and small statured occupants. Since occupant stature is not generally captured in crash

[9] NHTSA-2020-0094-0006 (the comments were submitted on Dec. 27, 2020, and presented to NHTSA in March 2021).
[10] National Highway Traffic Safety Administration (NHTSA) Motor Vehicle Crash Data Querying and Reporting, Occupants Involved in Motor Vehicle Crashes. Filter Selected: Less than One Year <=Age<= 20 Years; Person Type: Driver or Occupant; Seating Position: Front Seat, Right Side. Years:2005-2019 (https://cdan.dot.gov/query). Version 3.3.1 Release Mar 9, 2021.

data, we note that a 5th percentile female weighing 108 pounds is approximately equivalent in weight to a 50th percentile 13- or 14-year-old.

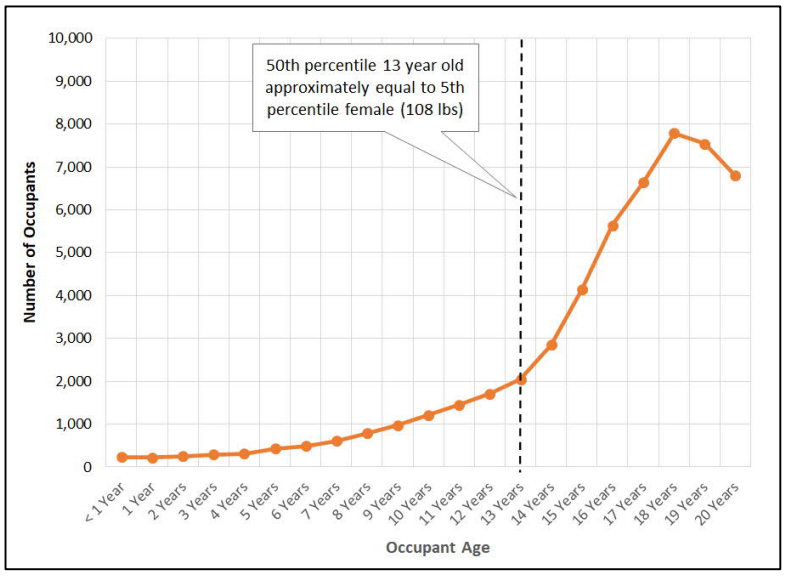

Figure 5: Occupants in Right Front Seat, Fatal Crashes, Total 2005-2019 CY

These data demonstrate that exposure rates are far greater for smaller stature occupants in fatal crashes (i.e., over 13 years old) than for younger children (i.e., under 6 years old).[11]

The proposed changes to Appendix A-1 could also potentially limit the use of certain weight- or pressure-based suppression systems for the 5th percentile female (AF5) or older child occupants, and/or would, in effect, require low-risk deployment countermeasures be provided as an alternative. In light of the concerns detailed above, we request that NHTSA reconsider the list of child restraint systems included in Sub Part B, C, and D to ensure a reasonable weight threshold that is more consistent with the current weights of CRS listed in the standard.

The NHTSA technical assessment document that was published in support of the NPRM includes discussion on the use of weight-based sensors for complying with the automatic airbag suppression requirements of FMVSS 208:

> *Some manufacturers rely on weight-based technologies to comply with the automatic air bag suppression requirement. Weight-based technologies utilize load cells or other sensors in the vehicle seat that suppress the air bag when a child or a child in a CRS is placed on the seat and enables the air bag's deployment if an adult occupies the front*

[11] CDC growth charts - https://www.cdc.gov/growthcharts/data/set1clinical/cj41c021.pdf

passenger seat. The threshold for enabling the air bag's deployment is dependent on the design and calibration of the suppression system used. Manufacturers choosing to rely on an air bag suppression system to minimize the risk to children in a CRS must ensure that the vehicle complies with the suppression requirements when tested with the CRSs specified in the appendix of the standard. To ensure the robustness of automatic air bag suppression systems, NHTSA intended for the appendix to represent a large portion of the CRS market, while including exceptionally large or small restraints. [12]

However, there is limited consideration of whether the CRS included in the report adversely impact the compliance options that may be available to manufacturers as a result of the inclusion of certain "exceptionally large" CRS available in the market. Ensuring a more a balanced approach would require less lead time for implementation, and would allow for additional research to ensure overall occupant safety is maintained as a result of changes in the Standard.

3. Additional NHTSA research

As discussed above, with the increase in weights of CRS listed in Appendix A-1, it may no longer be possible for vehicle manufacturers to implement a solely weight-based approach for automatic suppression above a certain threshold.

At present, there are no limitations on the potential weight of CRS designs nor recommendations for CRS manufacturers in ensuring compatibility with in-vehicle safety system, particularly with respect to the impact certain designs may have on weight-based systems. Auto Innovators remains concerned that this unrestricted increase in CRS weights will drive unwarranted changes to airbag suppression and deployment thresholds that are inconsistent with the intent of the advanced airbag rule to protect at risk populations in the front seat. While alternative technology solutions may be feasible with adequate lead time provided, we encourage further dialogue between NHTSA, CRS manufacturers, and OEMs to identify opportunities for developing additional compliance options that ensure future changes to the standard are consistent with overall occupant safety. We also urge the agency to evaluate whether there are further opportunities to address issues where the physical properties of the CRS could potentially conflict with the requirements established in other FMVSS. This could include updates to CRS labeling, the establishment of weight limits for seats used in certain seating configurations or both.

[12] "Technical Assessment of FMVSS No. 208, Occupant Crash Protection, Appendix A-1," Light Duty Vehicle Division November 10, 2020 (*see Docket: NHTSA-2020-0094-0005*)

Additionally, NHTSA should conduct further analysis to assess the regulatory impact on existing vehicle designs when including CRS that are significantly above the current threshold values established in Appendix A-1, and the potential impact this may have on overall occupant safety.

4. Summary

In summary, Auto Innovators recommends that NHTSA continue in its efforts to update the list of child restraint systems in Appendix A-1 to reflect current market availability and enable the easier acquisition of CRSs for testing purposes. However, we respectfully request that NHTSA reconsider the list of child restraint systems included in proposed changes to Sub Parts B, C and D, to ensure a reasonable weight threshold that is more consistent with the weights of CRSs listed in the current standard. Should the agency decide to proceed with the CRS currently proposed in the NPRM additional adequate lead time will be necessary to allow for extensive testing and potential re-design of airbag suppression systems. We also urge further research to assess the regulatory impact of changes to the standard on existing vehicle design, and the potential impact on occupant safety.

Please let me know if you have any questions.

Sincerely,

Scott Schmidt
Vice President, Safety Policy