January 3, 2005

Dr. Jeffrey Runge, Administrator
National Highway Traffic Safety Administration
U.S. Department of Transportation
400 7th Street, S.W.
Washington, D.C. 20590

Comments on Request for Comments; Frontal New Car Assessment Program; 69 FR 61071 *et seq.*; Docket NHTSA-2004-18765

Dear Administrator Runge:

Public Citizen is pleased to have the opportunity to comment on the National Highway Traffic Safety Administration's (NHTSA) request for comments regarding potential changes to the New Car Assessment Program's (NCAP) frontal impact crash test and rating procedures.

The Frontal NCAP Program Should Be Made More Comprehensive and Rigorous

Public Citizen believes strongly that the agency should update and improve the frontal NCAP program to ensure it provides accurate and comprehensive information to the consumer on the relative safety of vehicles on the market. The fact that 88 percent of model year (MY) 2003 tested vehicles received a four- or five-star driver-side safety rating, compared to 30 percent of MY 1979, indicates that the value of the NCAP system is distinguishing relative safety of vehicles has declined.[1] As we improve our understanding of the complex factors involved in determining vehicle crash safety, including the importance of a vehicle's overall structural integrity and the significance of providing particularly strong protections for the most vulnerable areas of the occupant's body, it is the agency's responsibility to upgrade the NCAP program to provide accurate and comprehensive safety information to the public.

It is essential that the NCAP frontal crash test provide crucial safety information given the frequency and severity of frontal crashes. Frontal crashes are one of the most frequent types of crashes, and more people die in frontal crashes every year than any other kind of crash. According to NHTSA, in 2003 there were 4,000 fatal frontal crashes, and another 71,000 non-fatal injurious frontal crashes — and those figures include only straight-on frontal crashes; most frontal impact crashes occur at an angle.[2] Frontal collisions are the most violent crash mode. In 2002 alone, nearly 17,000 people died in frontal impact crashes, which include straight-on and angular crashes. Thirty-six percent

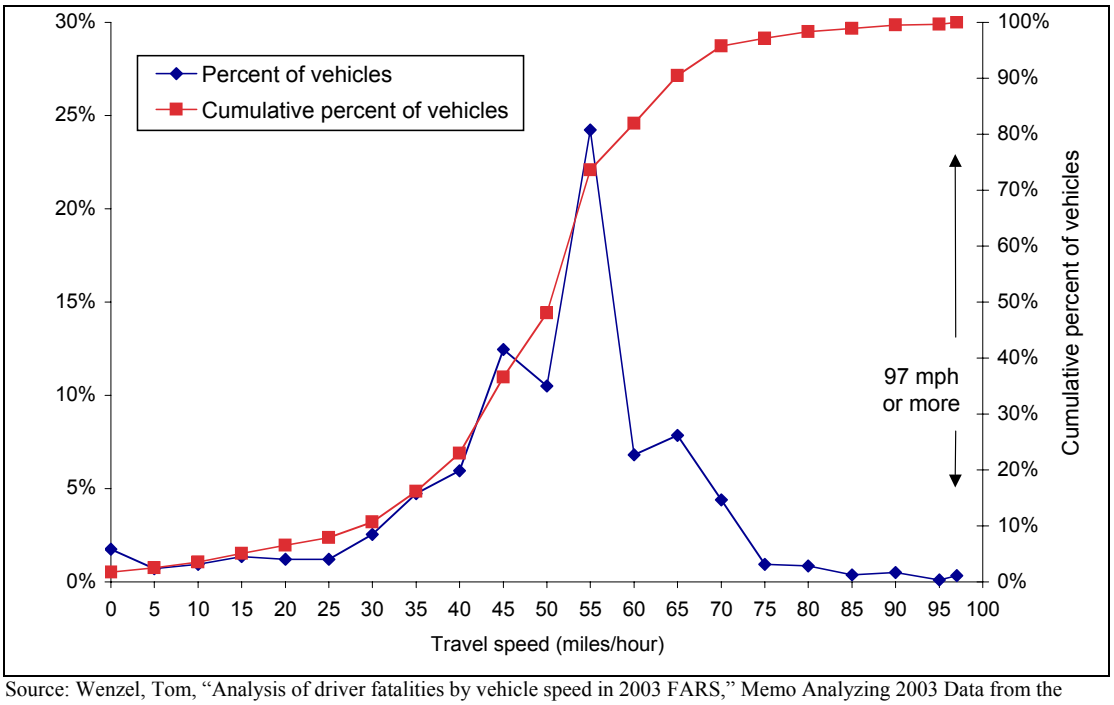
of the people who died were recorded as wearing safety belt, an unacceptably high number that indicates frontal crash protection is not doing all it should.[3]

Increasing Frontal Crash Test Speeds Would Produce Important Safety Gains

Public Citizen endorses NHTSA's suggestion to increase the frontal NCAP test speed to 40 mph. The crash test speed of the frontal crash test required for compliance with Federal Motor Vehicle Safety Standard (FMVSS) No. 208 has recently been raised to 35 mph for belted occupants, equivalent to the current NCAP belted test speed. We agree with the agency that maintaining a higher test speed in the NCAP program would make differences in frontal crashworthiness performance among vehicles more obvious. It would also help to ensure that the NCAP program fulfills its purpose of creating an incentive for manufacturers to improve crash safety significantly above and beyond the minimum requirements of FMVSS compliance tests.

Another critical reason for increasing the speed of the frontal NCAP crash test is that higher speed frontal crashes, such as at 40-60 mph, are a significant proportion of fatal frontal crashes and frontal crash fatalities. The agency observes that 1993-2002 data from the National Automotive Sampling System (NASS) indicate that 0.4 percent of front seat occupants in frontal crashes are involved in crashes with a change in velocity of 40 mph or higher, but of this population of occupants these higher speed crashes accounted for *30 percent of fatalities*.[4] While there are many low-speed frontal crashes, less frequent high-speed crashes are the source of a considerable number of deaths.

Figure A. One Half of All 2003 Fatal Frontal Crashes Occurred at 50 mph or Faster



Source: Wenzel, Tom, "Analysis of driver fatalities by vehicle speed in 2003 FARS," Memo Analyzing 2003 Data from the National Highway Traffic Safety Administration's Fatality Analysis Reporting System, Dec. 13, 2004.

Moreover, the interval of fatal frontal crashes that occur at 40-60 mph is the largest bulge in the data lines regarding fatal crashes (*see* **Figure A**). According to 2003 data on fatal head-on crashes from NHTSA's Fatality Analysis Reporting System (FARS), deadly frontal crashes occur disproportionately at speeds above the current NCAP crash test speed. *Only 15 percent of vehicles involved in fatal head-on crashes were traveling at 35 mph or less, while a full half were traveling at 50 mph or faster. One quarter of all vehicles involved in fatal frontal crashes were reported to be traveling at 55 mph.*[5]

Improvements in vehicle safety at faster crash speeds could reap significant benefits in terms of additional lives saved. Moreover, NHTSA demonstrated that such improvements are feasible *thirty years ago* with the Research Safety Vehicle (RSV) program of the 1970s. After investing many millions of dollars into the program, NHTSA successfully produced in 1977 vehicles that offered 50 mph frontal crash protection while also achieving the 1985 fuel economy standard of 27.5 mpg.[6] The current NHTSA rhetoric and research completely ignore the documented achievements of the RSV program.

Although in very high speed crashes (perhaps 70 mph+), vehicle structural integrity and safety technologies are simply overridden by the tremendous forces of the crash, any improvements in occupant safety for higher speed frontal crashes could significantly reduce highway deaths in frontal crashes.

NHTSA Should Establish Safeguards to Prevent Manufacturers from Increasing Vehicle Aggressivity in Response to Higher Crash Test Speeds

While it is clear that increasing the speed of the NCAP crash test could result in more lives saved in higher speed crashes, the automakers must not be permitted to enhance occupant protection at the expense of others on the road.

Public Citizen shares the agency's concern that, given the opportunity, manufacturers may respond to an increased NCAP testing speed by increasing vehicle stiffness, as well as increasing the aggressiveness of frontal air bags. Overly aggressive air bags would pose a potential risk because occupants in low-speed crashes will often be out-of-position for an air bag designed for high speeds and could be struck by it before it is fully inflated, which can cause serious or fatal injuries. However, the agency was specifically required to address and mitigate this type of risk by Congress in the Transportation Equity Act for the 21st Century (TEA-21). In TEA-21 Congress mandated twin goals for the agency: improving protection for occupants of all sizes, belted and unbelted, in moderate to high speed crashes; and minimizing the risks posed by air bags to infants, children, and other occupants, especially in low speed crashes.

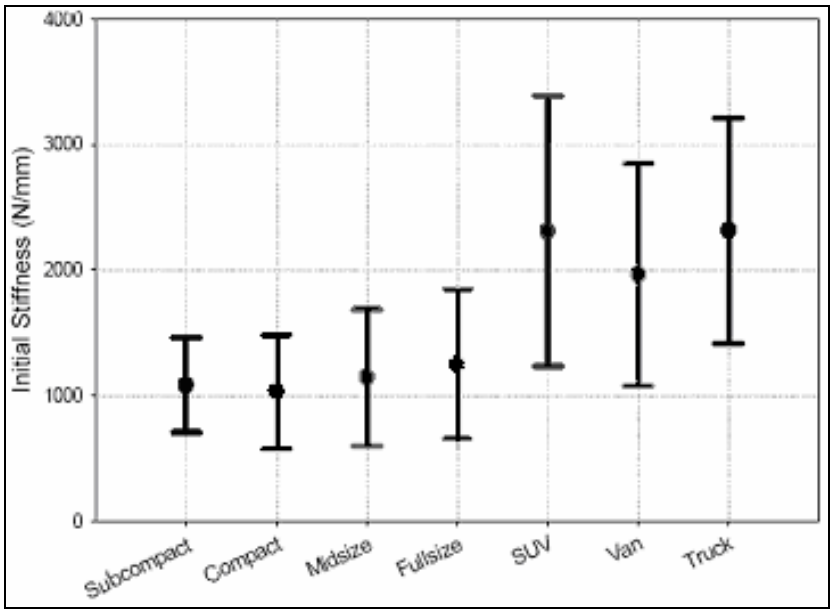
The solution to the problem of air bag aggressivity is low-speed crashes is multi-stage inflation air bags, which adjust inflation depending on whether a crash is low- or high-speed. Multi-stage inflation air bags were central to the development of NHTSA's Advanced Airbag Rule, the agency response to the requirements of TEA-21. NHTSA

should evaluate whether the rule is sufficient to ensure the safety of air bags that may be modified in response to an increased frontal NCAP crash test speed. If NHTSA finds that there is a significant potential that the Advanced Air Bag Rule is insufficient to ensure adequate safety, as mandated by Congress, the agency must amend the rule or develop further rulemaking to further ensure air bag safety in higher-speed impacts.

The other potential unintended adverse consequences of an increased NCAP crash test speed raised by the agency notice, increased vehicle stiffness, must also be addressed. Vehicle stiffness is correlated with increased vehicle aggressivity, meaning that an increase in frontal NCAP crash test speed must be accompanied or closely followed by regulatory compatibility requirements for manufacturers. The automakers concocted a so-called "voluntary agreement" in 2003 to improve passenger vehicle compatibility by 2009, but it in no way requires manufacturers to reduce the stiffness in overly rigid vehicles — nor does it hold the industry accountable if it fails to make any improvements in vehicle compatibility.

As illustrated by **Figure B**, research by NHTSA has indicated that vehicle stiffness generally increases with vehicle weight, and SUVs and pickups — the most aggressive passenger vehicles — are much stiffer than passenger cars.[7]

Figure B. Light Trucks Are the Stiffest Passenger Vehicles



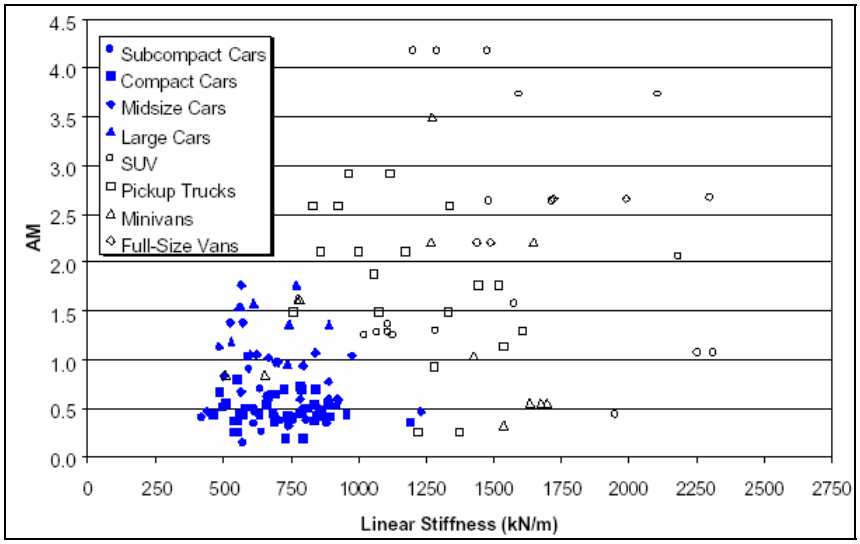
Source: Swanson, Jesse *et al.*, ACE Systems Tech., Inc. and National Highway Traffic Safety Administration, "Evaluation of Stiffness Measures from the U.S. New Car Assessment Program," Paper No. 527, 18th ESV Conference, Nagoya, May 2003.

While light trucks are by far the stiffest passenger vehicles, passenger car stiffness has been consistently increasing with each subsequent model year.[8] Increased vehicle stiffness adversely affects safety by making vehicles more aggressive and damaging to other vehicles, particularly in side-impact crashes. In two-vehicle frontal crashes, vehicle stiffness means that more energy will be transferred to the less-rigid vehicle. Just as the

above figure shows that SUVs, vans and pickup trucks are the most stiff vehicle types, fatality data also indicate that these are the most deadly in frontal impacts with other vehicles. For every 1,000 police-reported front-to-front crashes involving a full-sized pickup truck, there are on average 45 deaths in the other vehicles; for SUVs the average is 22.6 deaths. In comparison, midsized passenger cars average only about 11 other-vehicle deaths.[9] Large pickup trucks and SUVs are respectively two and four times as deadly to other vehicles in a front-to-front impact with them — regardless of what type of vehicle the other vehicle is.

A NHTSA analysis in 1999 compared vehicle stiffness to its aggressivity to other vehicles. The aggressivity metric (AM) is calculated as the number of occupant fatalities in the collision partner divided by the number of two-vehicle collisions involving the subject vehicle. As illustrated in **Figure C**, the study shows that not only is stiffness significantly correlated with aggressivity, but vehicle aggressiveness is also strongly associated with light trucks, and specifically with pickups and SUVs.[10]

Figure C. Stiffer Vehicles Are More Deadly to Other Drivers in Crashes

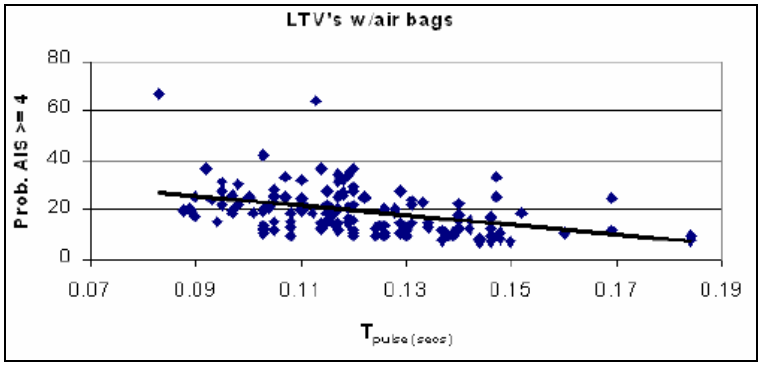


Source: Gabler, Hampton C. *et al.*, National Highway Traffic Safety Administration and Rowan University, "The Crash Compatibility of Cars and Light Trucks," Washington, D.C.: NHTSA, Feb. 15, 1999, at 26.

Increasing Vehicle Stiffness Does Not Improve Frontal Crash Safety

While increasing vehicle stiffness seriously increases risks for other people on the road, it does little to protect the occupants of a vehicle in both frontal and side impact crashes. Greater vehicle stiffness limits vehicle crush and lowers the impact period of the crash — thereby increasing the amount of deceleration taking place in the collision. Since crash energy is a function of deceleration and mass, this results in a more forceful, violent crash. The more violent the crash, the greater the burden placed on occupant restraint systems to mitigate force loading on the vehicle's occupants. A NHTSA analysis of data from frontal NCAP crash testing of light trucks indicates that longer the period of deceleration during the crash impact — a direct factor of energy absorption — the lower the probability of serious or deadly occupant injuries[11] (*see* **Figure D**).

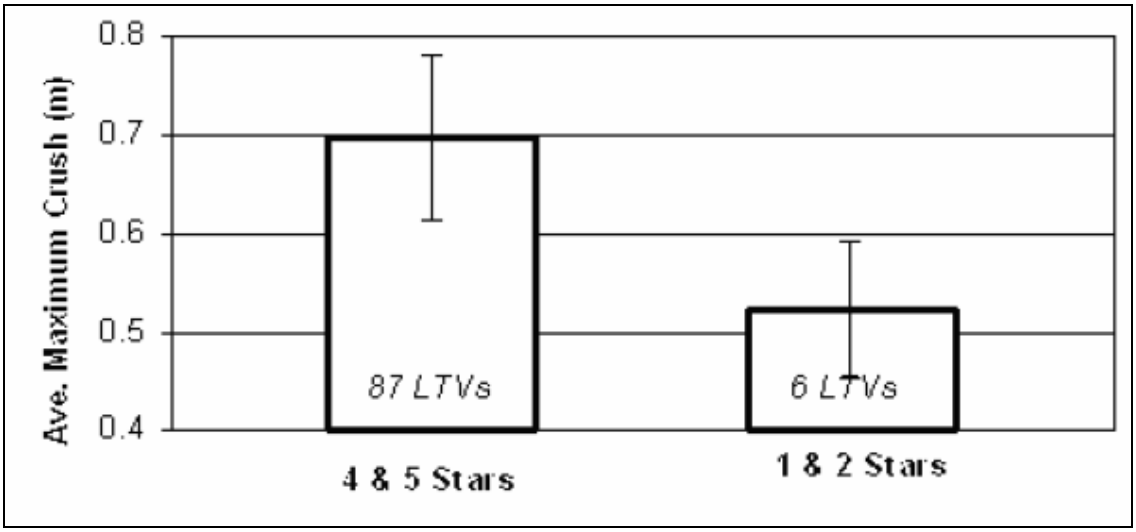
Figure D. Greater Vehicle Crush Means More Time to Decelerate, and Less Risk of Serious or Fatal Occupant Injuries



Source: Park, Brian T. *et al.*, "The New Car Assessment Program: Has It Led to Stiffer Light Trucks and Vans over the Years?" Paper No. 1999-01-0064, 1999 SAE International Congress & Exposition, Detroit, March 1-4, 1999.

The agency's study shows that less light truck stiffness also correlates with better frontal NCAP scores, as shown below in **Figure E**. In almost one hundred frontal NCAP tests in which the air bag and safety belts restrained the driver and passenger dummies and resulting NCAP ratings were either high (4-5 stars) or low (1-2 stars), high-rated light trucks averaged *40 percent* more front-end crush than low-rated light trucks.[12] Manufacturers that increase vehicle stiffness in response to a higher crash test speed may actually reduce frontal crash protection rather than improve it.

Figure E. Average Frontal End Crush Greater for Light Trucks with Higher Frontal NCAP Star Ratings



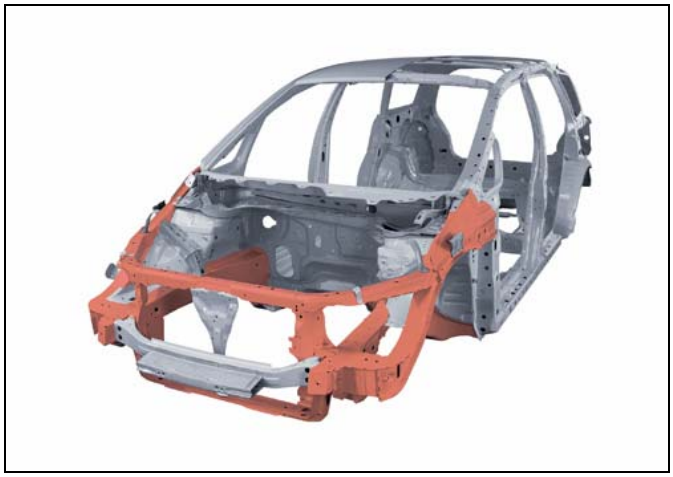
Source: Park, Brian T. *et al.*, "The New Car Assessment Program: Has It Led to Stiffer Light Trucks and Vans over the Years?" Paper No. 1999-01-0064, 1999 SAE International Congress & Exposition, Detroit, March 1-4, 1999.

Stiffness is not beneficial for occupant protection in offset frontal crash tests either. For example, in frontal offset crash testing by the Insurance Institute for Highway Safety (IIHS), in which vehicles were crashed at 40 mph into a barrier that covered 40 percent of the vehicle's front end, neither vehicle stiffness nor vehicle mass significantly correspond to good frontal impact safety performance.[13]

Vehicle Crushability, Not Stiffness, Is Key to Responsible Improvements in Frontal Impact Safety

Improving frontal energy absorption is the appropriate and responsible design option to improve frontal impact safety. The safety potential of improved frontal energy absorption is dramatically demonstrated by Honda's Advanced Compatibility Engineering (ACE) body structure, illustrated in **Figure F**. ACE can increase the energy absorption capability of the engine compartment by 50 percent, and reduce force loads on occupants in frontal crashes by *one-third*. This would greatly reduce the burden on occupant restraints. Moreover, ACE involves frontal structural geometry designed specifically to increase compatibility and "catch" the frontal structure of a larger colliding vehicle, such as an SUV or pickup truck.[14] Better crash protection demands structures intentionally designed to absorb energy in collisions — protecting both occupants and people in other vehicles.

Figure F. Illustration of Honda ACE Body Structure



Another example of an innovative safety design for frontal crashes that exploits increased energy absorption is the Chrysler Group's new design for frame rail front tips, which is featured on the 2004 Dodge Durango and 2005 Dodge Dakota. Traditionally, front frame rail tips, which are located where the bumper attaches, have rectangular cross-sections with many bend points that can cause bending failures and have poor energy absorption. Particularly in side impacts, conventional frame rail tips can operate like the tines of a fork, deeply and destructively guiding the truck through the impacted other vehicle. While we by no means endorse either the Durango or Dakota — which are overly stiff and whose 2000-2003 models are currently subject to a recall for dangerously defective ball joints[15] — the new Chrysler design appears to significantly improve the

vehicle's energy absorption during frontal-impact crashes through hydroformed front frame rail tips that are tapered and octagonal-shaped, crushing uniformly "like an accordion" in frontal crashes.[16]

NHTSA Should Issue a Compatibility Safety Standard

Public Citizen urges the agency to open a new regulatory docket and swiftly develop a rulemaking that establishes basic new compatibility requirements for vehicle design to far better protect those who share the highways with today's stiff, overly aggressive vehicles. NHTSA should address the broader potential societal impact of an increased frontal NCAP crash test. Efforts to improve occupant self-protection at the impairment of "partner-protection," or the safety of occupants in other vehicles, should not be permitted. Employing both laboratory testing, as well as analysis of real-world data to isolate best and worst practices in vehicle compatibility, the agency should develop and implement a metric for a standard that incorporates vehicle energy absorption, as well as measurements of geometric compatibility, such as average-height-of-force (AHOF) and average bumper height.

Improved compatibility would also reduce repair expenses from low-speed "fender-benders." While federal law requires that passenger car bumpers be at about the same level to ensure engagement in crashes, there is no such requirement for light trucks. This means that even in crashes at speeds of 10 miles an hour, SUVs can inflict many thousands of dollars of damage on a passenger car by missing engagement with the bumper and inflicting damage on the sheet metal, lights, grill, etc.[17]

Voluntary Industry Agreement Cannot Take the Place of a Compatibility Standard

Although in 2003 the automakers established a voluntary agreement on improving vehicle compatibility, the agency should not let a voluntary "standard" take the place of a federal safety standard. Voluntary safety "standards" do not work, and the historical path of automakers' voluntary efforts is paved with broken promises. From General Motors' promises in 1970 to voluntarily put air bags in all its vehicles by the mid-1970s (GM installed just 10,000 in model year 1974 and 1975 vehicles, and then discontinued the program), to Ford, DaimlerChrysler and GM's recent recanting of their widely publicized 2001 promises to voluntarily improve the fuel economy of their light trucks by 25 percent (withdrawn after the threat of Congressional action on fuel economy receded), "voluntary" is often just another name for the manufacturers' tactical maneuvers and delay.

Voluntary "standards" violate core principles of democratic accountability and transparency because they involve no mechanisms for accountability; are put together in secret, without public participation; and involve no independent process for verifying compliance. The public, which is at risk, is shut out of the development of the proposal, which instead is designed in secret by industry working groups that are not subject to oversight, compliance with statutory requirements, responsibility for explaining the basis for their decisions, or judicial review of their decisions. If the voluntary proposal proves

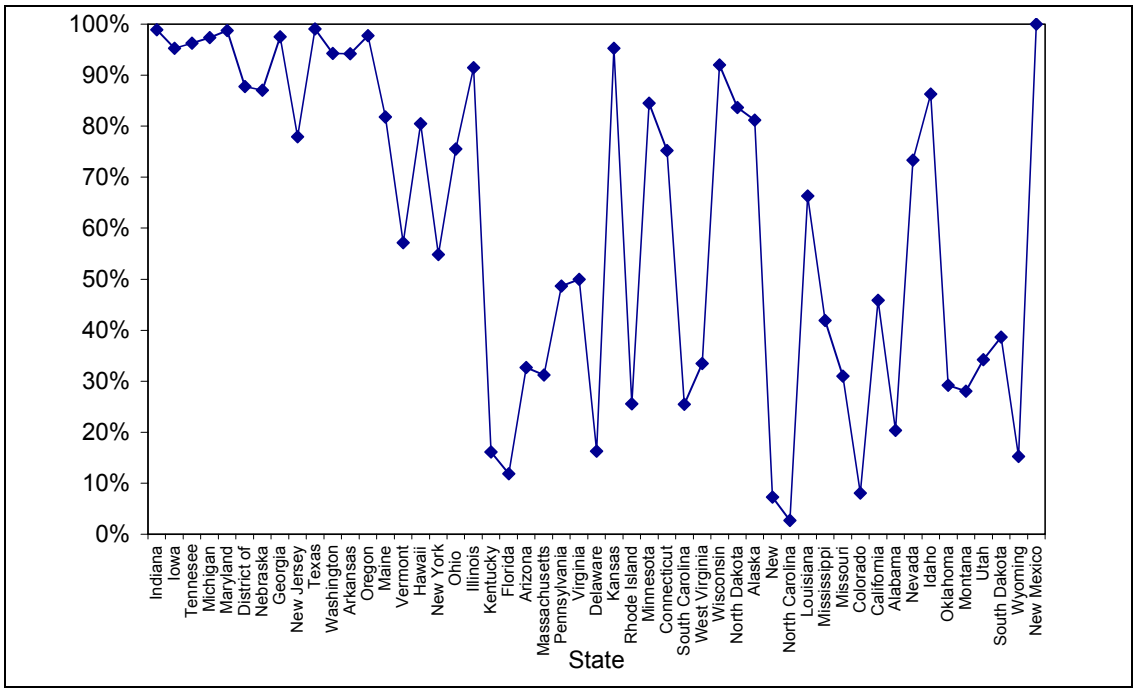
to be dangerously insufficient, automakers evade liability and there is no recourse for injured consumers. Moreover, voluntary "standards" lack a baseline for safety and proposals are invariably weak because they represent the lowest common denominator among companies looking out for their own costs and product plans.

The Agency Should Improve the Collection of Real-World Crash Data and Expand the Criteria for Data Collected

NHTSA should move to aggressively improve data collection standards as well as to enhance existing data systems because a dearth of real-world crash data is impeding compatibility analysis. For example, the delta-V variable in the National Automotive Sampling System (NASS) is a crude estimation done by a computer program after information is entered regarding the physical deformation of the vehicles involved. In contrast, the travel speed variable in the Fatality Analysis Reporting System (FARS) data is an estimate by the police officer who responded to the crash. While the NASS method of estimating the delta-V of a crash may be too indirect to provide sufficiently accurate estimates, the FARS method of estimating crash speed depends significantly on police officers' training and care to detail, which could vary greatly.

The reliability of FARS reporting by states varies vastly as well. At least a quarter of states, for example, report dubious average crash speeds of less than 40 mph. Moreover, the percent of crashes where crash speed went unreported varies from less than 10 percent in New Hampshire and North Carolina to over 90 percent in Illinois, Kansas, Wisconsin, and New Mexico [18] (*see* **Figure G**).

Figure G. Percent of Speeds Not Reported or Unknown, by State, 2003 FARS



Source: Wenzel, Tom, "Analysis of driver fatalities by vehicle speed in 2003 FARS," Memo Analyzing 2003 Data from the National Highway Traffic Safety Administration's Fatality Analysis Reporting System, Dec. 13, 2004.

There are many steps that the agency could take to improve data quality for the purpose of enhancing compatibility and other crash research. NHTSA should significantly increase the number of crash cases investigated for NASS in order to enhance the statistical validity of research conclusions derived from the data. The agency should also more adequately document in NASS a number of the most critical aspects of multiple vehicle crashes. For example, refined height measurements for each involved vehicle structure, enhanced documentation of both crash-involved vehicles through photography to record possible override or under-ride, documentation of vehicles' deformation covering a greater number of the vehicles' energy-absorbing structures, including frame rails, engine components, firewall, pillars, etc.

NHTSA should also evaluate FARS and increase the number of compatibility-related measurements indexed. The agency should request more funding from Congress and establish high FARS reporting requirements for states so that the data can be used to draw statistically robust conclusions about the state's fatal crash characteristics. NHTSA should provide funding to states for extensive police training on how to accurately record FARS data for crashes. In addition, the agency should institute annual conferences with police representatives from all 50 states to ensure consistency in data collection techniques, to discuss common collection issues, and to offer refinements.

Finally, NHTSA should improve consumer information on safety and aggressivity to enable ethical decision making by consumers. The agency should publish risks to drivers, risks to other drivers, and combined risks of individual passenger vehicle model based on a regular analysis of real-world fatality data.

A High-Resolution Deformable Test Barrier Should Be Adopted for NCAP Testing

In order to facilitate the development of compatibility requirements, we also recommend that NHTSA adopt a deformable, high-resolution test barrier to improve the quality of the data on how different vehicles transfer their force in crashes. This would be particularly useful in studying geometric compatibility metrics such as Average Height of Force (AHOF).

Currently the agency uses a relatively coarse resolution (2108.2 mm x 984.25 mm) 4x9 load cell wall (LCW) in NCAP tests. However, agency research indicates the significant superiority of a higher resolution deformable LCW for compatibility research, such as the U.K.'s Transport Research Laboratory's (TRL) full width 2000 mm x 1000 mm, deformable LCW with an 8 x 16 matrix of 125 mm square load cells. A higher resolution LCW is less likely to permit the vehicle's dominant structural load paths to bridge the edge of an adjoining load cell, distorting the load average for that cell. A barrier like the TRL LCW has the potential to separate the structural loads from contributors such as the engine that can reduce the effect of the recorded force of the vehicle's structure. In addition, this higher-resolution LCW has the capacity to record the loads from structural cross members, which would be missed with the use of a rigid wall.[19]

50th Percentile Male Dummies and 5th percentile Female Dummies Should Be Tested in Both Seating Positions

Public Citizen believes that the agency should vary the dummy used in the front seating positions, similar to the second option proposed in the notice.[20] However, we urge the agency to require frontal NCAP testing with the 5th percentile adult female dummy and 50th percentile adult male dummy in the driver and front passenger seating positions, and then require they also be tested with switched seating positions. Testing both dummies in both seating positions would ensure that frontal crash safety is not improved for a specific occupant size in each seating position, but rather that manufacturers improve safety for a broad range of occupant sizes in both frontal seating positions.[21]

Six- and Ten-year-old Child Dummies Should Be Placed in Rear Outboard Seating Positions

In all frontal NCAP tests the agency should require that both a ten- and six-year-old Hybrid III child dummy be restrained in an appropriate child seat, each positioned in either outboard rear seating positions. This would improve rear seat safety, better ensure adequate frontal impact safety for children, and help the agency meet a requirement under the Transportation Recall Enhancement, Accountability, and Documentation (TREAD) Act to improve protection for occupants of all sizes, belted and unbelted, in moderate to high speed crashes.[22]

NHTSA Should Add a Frontal Offset Crash Test to the Frontal NCAP Testing Program

Public Citizen urges the agency to adopt an offset frontal crash test similar to the EuroNCAP offset test, in which a vehicle is crashed at 40 mph into a deformable honeycomb barrier across 40 percent of the vehicle's front end. While currently the U.S. NCAP program has only a full frontal crash test, a recent study of data from NASS suggests that at least 80 percent of front-to-front two-vehicle collisions in this country are offset — defined as less than 85 percent overlap of the two vehicles' front ends.[23]

This test should be adopted as a necessary companion to a full frontal crash test because, as the agency notes, while the full frontal test provides a more rigorous assessment of occupant restraint systems, an offset test provides a superior evaluation of the vehicle structure. As articulated above, we believe it is important that both a 5th percentile female and 50th percentile male Hybrid III dummies be tested in each frontal seating position to improve protection for a broader range of occupants — particularly given the asymmetric nature of offset crash impacts, where in one front side of the vehicle sustains more of the crash forces. We urge the agency to adopt a 40 mph offset crash test speed, but we also ask that NHTSA develop and issue compatibility requirements.

Rating Limits Should Be Adjusted To Increase Stringency

We support NHTSA's suggestion of redefining each of the five rating probability limits by adjusting the current rating bands to increase stringency. The agency should use a 5 percent or less chance of serious injury to the head and chest to establish a five star performance, and adjust the stringency of other star rating bands correspondingly. Moreover, NHTSA should institute a regular evaluation of the effectiveness of the NCAP procedures, calculations and criteria to ensure that the program provides consumers with a meaningful measure of the relative safety of vehicles, and gives manufacturers a meaningful incentive to improve the safety of vehicles.

The fact that almost 90 percent of the tested model year 2003 vehicles received a four- or five-star frontal crash rating, compared to only 30 percent of MY 1979 vehicles, is a testament to momentous improvements in frontal crash safety [24] — namely, the required installation of three-point safety belts and air bags. Yet frontal crashes continue to generate the most fatalities of any crash mode. It is critical that the agency ensure that the rating system can effectively distinguish for consumers between the varying relative levels of frontal crash safety provided by vehicles. As NHTSA states on the www.safercars.gov Web site, the NCAP program has "the primary purpose of providing consumers with a measure of the ***relative*** safety potential of vehicles" [emphasis added].[25]

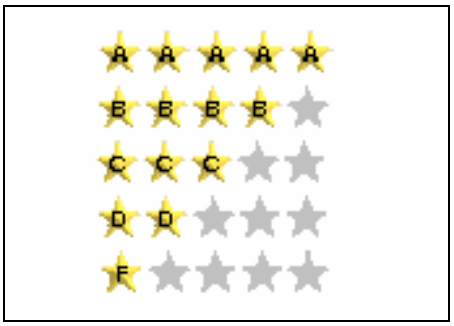
Incorporating Letter Grades into the Star Ratings Would Dramatically Enhance Consumers' Comprehension of the Ratings

The NCAP program provides essential safety information to consumers who are considering the purchase of a new or used vehicle. However, the star rating system is not necessarily the clearest presentation of relative vehicle safety because some consumers, particularly those new to the NCAP information program, may misinterpret one or two stars because stars are generally associated with positive performance and are analogous to a teacher putting a star sticker on a young student's paper to denote a job "well done." NHTSA should present its rating information in the most clear, comprehensible format reasonable to ensure that consumers can use the critical safety information to make informed purchasing decisions, which impact not only the vehicle purchaser, but their family and other potential passengers as well.

Incorporating a letter grade system into the star system, as illustrated by **Figure H**, would significantly enhance the NCAP rating system by clarifying the relative differences in safety between vehicles. A star safety rating, without further context, does not immediately imply to a consumer the scale of the rating system and the relative position of the particular rating on that scale — which is, of course, all-important in a system that provides consumers with "a measure of the relative safety potential of vehicles." Letter grades provide much more contextualized information. With a letter grade system incorporated into the star ratings, a consumer could immediately imply the A-through-F, five-level rating scale (*e.g.*, a three-star / "C" rating would be interpreted as the third from the best). Moreover, as Advocates for Highway Safety has suggested in its

comments, star ratings with darkened stars indicating the margin of stars a rating is from five stars would as well provide more contextualized rating information (*e.g.* a three-star rating would show three stars along with two darkened stars).

Figure H. Letter Grades Would Enhance the Star Rating System



Injury Metrics Should Be Added to the NCAP Rating System, but Should Constitute Separate Ratings

The agency should also add new injury metrics to the rating program. Public Citizen supports adding injury criteria for neck loading (Niij) and chest deflection — as has been recently added to FMVSS No. 208 — as well as for femur and tibia loads. The agency already measures these metrics in NCAP tests, the risk curves for each of these injury metrics already exist, and adding these metrics would provide consumers a far more comprehensive assessment of the injury risks of tested vehicles.[26]

Part of the rationale for including more injury metrics in vehicle safety ratings is the need to consider the risk of seriously disabling but not generally fatal injuries, such as those to the lower leg. Risk of life-impairment, not just risk of mortality, should be a significant factor when determining vehicle safety. NHTSA research indicates that annually thousands of moderate to serious injuries occur with intrusion in the vehicle compartment of less than 6 inches. The vast majority of these injuries are lower leg and foot injures due to toe pan intrusion.[27] Such injuries can cause serious loss of mobility and chronic pain, which can lead to serious psychological harm as well; yet go unnoticed in the current rating system.

Public Citizen strongly believes that additional metrics should be included in the rating system, but that they should constitute a separate rating from the existing rating. While the additional metrics represent important injury risks that should be part of the NCAP information provided to consumers, we are concerned that merging the two most critical injury metrics — Head Injury Criterion (HIC) scores and chest acceleration — with less critical injury metrics may pose the risk of diluting the results of the most critical injury measurements. For example, a crash tested vehicle might have very good tibia and femur load measurements and perilously high HIC and chest acceleration measurements.

The agency should never water down a vehicle's critical injury risks. We recommend that the agency establish a critical injury rating using HIC and chest acceleration, and supplemental injury ratings determined using measurements of neck loading, chest deflection, femur and tibia loads. Such a system would both enhance comprehensiveness while ensuring accuracy. Already www.safercar.org notes that star ratings are "based on risk of head & chest injury." NHTSA should adopt two additional rows of vehicle ratings based on the additional injury measurements, divided by general level of critical injury as determined by NHTSA. An example below (**Figure I**) illustrates such a three-tier rating system.

Figure I. New Injury Metrics Should Be Included in Vehicle Safety Ratings

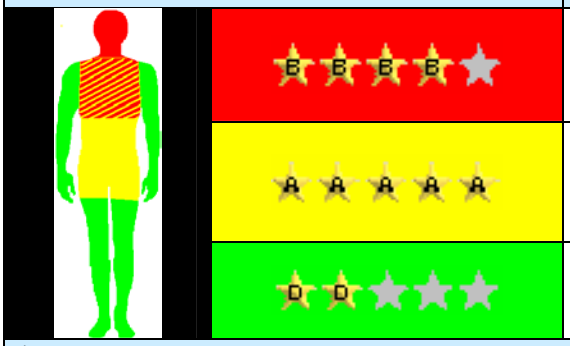
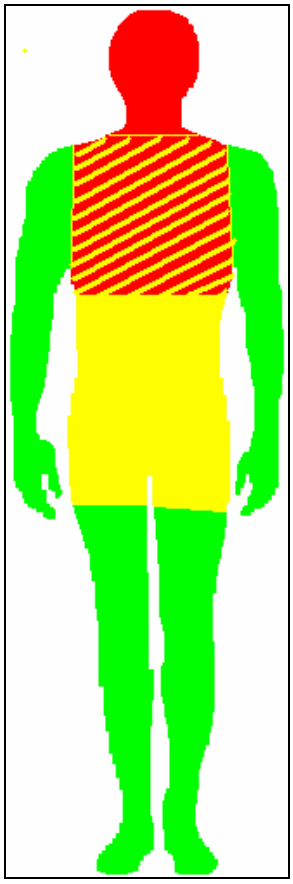
2006 Vehicle 4-Dr, w/SAB	Frontal Star Ratings
	**Risk of Serious Head and Chest Injury ***
	Risk of Serious Neck and other Chest Injury †
	Risk of Serious Upper and Lower Leg Injury ‡
* based on measurements of HIC and chest acceleration † based on measurements of neck loading and chest deflection ‡ based on measurements of femur and tibia loading	

Figure J. The Three-Tiered Safety Rating System Would Provide Consumers with Information on Risks of Both Deadly as well as Highly Debilitating Injuries



Conclusion

Public Citizen believes many changes are needed to improve the rigor, comprehensiveness and accuracy of the frontal NCAP program. We believe the incorporation of our concerns and recommendations into the final rulemaking would significantly enhance the value of a revised frontal NCAP program and lead to many more lives saved and injuries prevented in frontal impact crashes.

- Public Citizen endorses an increase the frontal NCAP test speed to 40 mph. Improvements in occupant safety for higher speed frontal crashes are feasible and would significantly reduce highway deaths in frontal crashes.

- Improving frontal energy absorption is the appropriate and responsible design option to improve frontal impact safety, and Public Citizen urges the agency to open a new regulatory docket and swiftly develop a rulemaking that establishes basic new compatibility requirements for vehicle design to far better protect those who share the highways with today's stiff, overly aggressive vehicles.

- NHTSA should move to aggressively improve data collection standards as well as to enhance existing data systems because a dearth of real-world crash data is impeding compatibility analysis.

- NHTSA should adopt a new deformable, high-resolution crash test barrier — such as the U.K.'s Transport Research Laboratory's full width 2000 mm x 1000 mm, deformable load cell wall with an 8 x 16 matrix of 125 mm square load cells — to improve the quality of the data on how different vehicles transfer their force in crashes.

- The agency should improve consumer information on safety and aggressivity to enable ethical decision making by consumers. NHTSA should publish risks to drivers, risks to other drivers, and combined risks of individual passenger vehicle model based on a regular analysis of real-world fatality data.

- We urge the agency to require frontal NCAP testing with the 5th percentile adult female dummy and 50th percentile adult male dummy in the driver and front passenger seating positions, and then require they also be tested with switched seating positions.

- In all frontal NCAP tests the agency should require that both a ten- and six-year-old Hybrid III child dummy be restrained in an appropriate child seat, each positioned in either outboard rear seating positions.

- Public Citizen urges the agency to adopt — as a necessary companion to a full frontal crash test — an offset frontal crash test similar to the EuroNCAP offset test, in which a vehicle is crashed at 40 mph into a deformable honeycomb barrier across 40 percent of the vehicle's front end.

- We support NHTSA's suggestion of redefining each of the five rating probability limits by adjusting the current rating bands to increase stringency. The agency should use a 5 percent or less chance of serious injury to the head and chest to establish a five star performance, and adjust the stringency of other star rating bands correspondingly.

- The agency should incorporate letter grades and darkened stars into the star ratings so as to provide far more contextualized information on relative vehicle safety.

- Public Citizen strongly believes that additional injury metrics should be included in the rating system, but that they should constitute separate ratings from the existing rating. We recommend that the agency establish a critical injury rating using HIC and chest acceleration, and supplemental injury ratings determined using measurements of neck loading, chest deflection, femur and tibia loads.

Thank you for your consideration of our comments.

Sincerely,

Joan Claybrook
President, Public Citizen

ENDNOTES

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