Testimony of Joan Claybrook, President, Public Citizen,
before the
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Resolving the Rollover-Roof Crush Tragedy

Chairman Pryor and members of the subcommittee, I am grateful to be here today to discuss the National Highway Traffic Safety Administration's utter and complete failure to provide the public with the protection that it needs in rollover crashes. I am Joan Claybrook, president of Public Citizen, and I have worked on auto safety issues for more than 40 years, first as a congressional staffer during the drafting of NHTSA's organic act, then as the special assistant to the first administrator of NHTSA, later as the administrator of NHTSA during the Carter administration, and ever since then as an advocate for the public.

In 1969, there were just 1,400 deaths in rollover crashes – at the time, pickup trucks were predominately work vehicles, and SUVs marketed as passenger-carrying vehicles had not entered the product mix.[1] As Congress has learned over the years, the rollover problem we now face is a direct result of the industry's marketing campaign to make SUVs the station wagon of the future.

Rollover crashes should be highly survivable. The forces felt by an occupant who has a rollover pretention restrain and who does not contact the roof are not as violent as those experienced in a frontal impact crash. The physics of rollover crashes are indisputable: rollover crashes occur over a 4-6 second time interval, whereas other crashes are over milliseconds. Consequently, the forces acting on occupants are relatively mild and the focus becomes threefold: (1) whether the restraint properly and safely keep the occupant in the survival zone of the vehicle; (2) whether the vehicle structure maintain the occupant survival space; and (3) whether the portals of ejection, e.g., side windows, stay intact thus preventing exposure to partial ejection.

In 2007 there were 10,698 fatalities in rollover crashes, accounting for 33 percent of all highway occupant fatalities.[2] By contrast, there have been fewer than 100 fatalities in plane crashes in the past three years combined.[3] If there were as many fatalities in plane crashes as there are in just rollover crashes, there would be overwhelming public outcry for the FAA to more strictly oversee the airline industry. Motor vehicle accidents are the number one killer of people aged 3 to 33, and rollover crashes account for a disproportionate and unnecessary number of these deaths.

To say that this is a national crisis ignores the fact that this has been a problem for almost twenty years, and yet, I am back before the Senate, asking that you revisit this issue again – for the sake of the over 10,500 families who lose a loved one each year in crashes that should be survivable and for the tens of thousands of others whose lives are irreversibly damaged by paralysis. Since 1991, when Congress first acted in the Intermodal Surface Transportation Efficiency Act (ISTEA)[4] and instructed NHTSA to take action, more than 155,000 Americans

have died in rollover crashes. These figures are appalling and reflect a clear lack of action on the part of the auto industry and, unfortunately, NHTSA.

After 20 years of pushing for a response from NHTSA to the problem of far too many rollover fatalities, we recommend that the agency do the following:

- Issue a comprehensive rollover crashworthiness standard that dynamically tests the performance of seat belts and belt pretensioners, door locks and door retention, side curtain airbags, glazing retention, ejection potential and roof crush resistance. The agency must abandon the current useless rulemaking and do it right.
- Until the agency can issue a dynamic crash test standard, it should provide widely publicized consumer information about roof strength using a static test that consists of two sequential platen tests. First, the platen is applied at a 10 degree pitch angle and a 25 degree roll angle for the first side, and then at a 40 degree roll angle for the second side. The roof should be able to reach a 3.5 times gross vehicle weight rating strength-to-weight ratio.

HISTORY

In 1970, NHTSA first addressed rollovers as a voluntary part of the airbag rule, Federal Motor Vehicle Safety Standard (FMVSS) 208, with a dynamic dolly rollover test. It was never made mandatory, but was used by industry internally to test their vehicles for decades. In 1971, NHTSA issued the mandatory static roof crush standard, FMVSS 216, but the final rule at GM's urging was seriously cut back from a two-sided test to a weak one-sided test which resulted in almost no improvement in roof strength. This standard is still in effect today.

It wasn't until a large number of consumers were driving pickup trucks and SUVs that fatalities due to rollover started to rise that Congress called for a reevaluation of rollover. It has taken nearly twenty years more for the agency to address rollover fatalities than when Congress first called for action, and the work is still not done.

Seventeen years ago Congress first acted to address this problem. In 1991, Congress passed the ISTEA, which directed NHTSA to develop a stability standard, and issue a rule by May 1994 to reduce head injury from contact with the upper interior of a vehicle. The stability standard has never been issued and was abandoned after an advance notice of proposed rulemaking in 1992. The rulemaking action was terminated in 1994, and American drivers are still waiting for a meaningful, comprehensive approach to rollover fatalities.[5]

Frederico Peña, then Secretary of Transportation, announced a plan to replace the terminated rulemaking with a comprehensive regulatory and information regime. This would include the consumer information on rollover propensity, as well as an upgrade of the side-impact and door retention standard and an examination of an upgrade to the roof crush standard.[6] The head injury rule was issued as a final rule in August 1995[7] and became effective in September 1995, with a phase-in through September 1998. The standard required padding on the door pillars, roof interiors and windshield headers for cars, pickup trucks and SUVs.

In May 2000, following an exposé by Houston television reporter Anna Werner of station KHOU, highlighting litigation relating to some of these very problems, NHTSA opened an investigation into the 47 million Firestone ATX and ATX II Wilderness tires Ford used on the Explorer. There were more than 200 deaths and 700 injuries just in rollover crashes of Ford

Explorers equipped with the faulty Firestone tires. In August, there was a voluntary recall of 6.5 million of these tires. The Ford-Firestone experience prompted Congress to pass the Transportation Recall Enhancement, Accountability and Documentation (TREAD) Act[8], which required a dynamic rollover test for consumer information. The dynamic test NHTSA used for this purpose only measures rollover *propensity*, it does not provide any information about rollover *crashworthiness*. In 2001, NHTSA issued its ANPRM on roof crush; however, nothing came of the rulemaking effort until just before the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU)[9] was signed into law in 2005.[10]

NHTSA decided to disseminate consumer information about rollover propensity through the New Car Assessment Program (NCAP). From 2001-2003, NHTSA based its NCAP rollover ratings on a measure of the vehicle's geometry, meant to estimate the relation between a vehicle's center of gravity height and track width, which is referred to as the static stability factor (SSF). In 2004, NHTSA added two dynamic rollover test maneuvers which estimate a vehicle's on-road, untripped rollover threshold. Although important, NHTSA's action failed to address the roughly 95 percent of rollover crashes that are tripped – that is when a vehicle starts to slide laterally and is tripped by mechanisms such as curbs, soft soil, pot holes, guard rails, or wheel rims digging into the pavement.

But in light of NHTSA's failure to provide consumers information about *occupant protection* in rollover crashes, inadequate information about rollover propensity, no improvement in the roof strength standard since it took effect in 1973, and no requirement for belt performance in rollover crashes, rollover fatalities continued to increase, with 10,590 fatalities in 2004. In 2005, Congress passed the SAFETEA-LU, which mandated rollover prevention, occupant ejection mitigation, and roof crush occupant protection upgrades.

In 2006 NHTSA issued its rollover prevention rule to much fanfare,[11] with NHTSA Administrator Nicole Nason calling electronic stability control the "the greatest life saving improvement since the safety belt."[12] By contrast, the proposed upgrade to the roof crush resistance standard was published just eight days after SAFETEA-LU was signed into law.[13] In response to the voluminous debate in the 2005 docket – containing 281 documents from the auto industry, public interest groups, and private engineers – as well as the results of additional two-sided static tests conducted by the agency, and results of independent dynamic tests conducted by the Center for Injury Research, NHTSA issued a Supplemental Notice of Proposed Rulemaking (SNPRM) in January of 2008.[14]

This latest proposal failed to correct the significant deficiencies in the 2005 proposal – NHTSA still neither mandates testing on both sides of the roof, nor has it considered dynamic testing, as the 2005 law requires. It also continues the misplacement of the test device that makes it easier to pass the test, but not protect occupants. Further, NHTSA's latest proposal was not accompanied by a new regulatory impact analysis, as the White House Executive Order 12,866 requires. Therefore, there is no estimate of the relative benefits of the regulatory options provided in the proposal, making fully-informed public comment impossible.

In its 2005 NPRM, NHTSA estimated that its proposed increase in roof strength would save between 13 and 44 lives. The "target population" of potentially avoided fatalities estimated in NHTSA's 2008 proposal is 476. These estimates show that NHTSA has neither looked at the problem of rollover fatalities in a new light nor made a real attempt to correct the problem. In the face of more than 10,000 fatalities a year, an "upgraded" rule that barely addresses five percent of the fatalities is just gross negligence.

Furthermore, the agency has callously included language that expresses the agency's view that injured parties should not be compensated by automakers whose vehicles comply with this weak federal standard even if those vehicles fail to protect occupants with catastrophic failure of structural components of the roof.

So now three Congressional mandates later, NHTSA has failed time and again to address the rollover crisis. There have been more than 155,000 rollover fatalities – that's almost three times the number of U.S. Armed forces killed in Vietnam – and more than 17 years to develop the standards and practices needed to prevent these unnecessary deaths, since Congress first intervened. It is a tragedy that I am here before the Committee again, asking for Congress to send a message to the agency: Issue a comprehensive rollover occupant protection standard that actually saves lives.

ROLLOVER CRASHES WREAK UNSPEAKABLE HAVOC ON TOO MANY FAMILIES

Jonathan Arreola was just 19 when his 2000 Toyota 4 Runner rolled over in California. The roof crushed in on his head, fracturing his skull and ending his life. His sister, who was 7 when he died, told her mother that she feels bad that her brother will never meet her kids when she gets older. This has left a void in his family's life. His mother asks: "With a top heavy SUV, how can a company not be mandated to test this factor?" The sad truth is that Congress *did* mandate that companies test this factor – but NHTSA callously decided not to.

Before the rollover crash that left Patrick Parker a quadriplegic, automobile safety was one of the last things on Patrick's and his wife Dena's mind. They had other things to think about at their Texas dream home in a rural part of the state: paying the bills, taking care of their house, finding time to relax on weekends. But their lives changed the tragic day that Patrick swerved to avoid a deer while driving to work. He missed the deer he saw, but he hit a second and his pickup truck flipped. Though he was wearing his safety belt, the roof crushed to nearly the level of the hood of the truck, breaking his neck. His Ford pickup cab was designed with doors that opened from the center to facilitate removal of tools and other equipment from the rear of the cab. But this type of door weakened the roof because there was no B-pillar by his shoulder.

In an instant, Patrick lost so much. The hunting and outdoor activities he once loved he can now only enjoy as memories. Months of intensive physical therapy have failed to improve his condition, and he now gets around his 30-acre ranch in a motorized wheelchair. His devoted wife Dena has struggled with him, helping him each morning for the three hours it takes him to get up, eat breakfast, take a shower, and get dressed. His best time of day, he explains, is when he goes to sleep and no longer feels the pain. At least his successful lawsuit means the Parkers do not have to leave their beloved ranch.

The sad fact is that this story gets retold day after day, year after year, with 29 fatalities *each day*, and more than 300 catastrophic injuries per week. Families will keep being broken until there is a comprehensive dynamic rollover standard that covers belt performance, door and glazing retention, and roof crush.

NEED FOR DYNAMIC TESTING

A rollover crash is a complex and dynamic event, with many interrelated hazards that all contribute to the risks vehicle occupants face. However, despite its complexity, the remedies are well-known and proven. It is NHTSA's responsibility to understand these crash dynamics and set a performance standard using a test that, as well as being practicable and repeatable, protects occupants from the impact of crash forces. A test of the strength for a vehicle roof that is neither inverted nor in motion cannot demonstrate the risk to occupants in a real-world rollover, where occupants are both inverted and in motion.

In order to be realistic and meaningful, any performance test must be two-sided. The risk to vehicle occupants varies depending on whether the occupant is seated in the "near side" or the "far side" of the vehicle. Imagine looking at a vehicle as it rolls sideways, in slow motion: as it rolls over, first one side of the vehicle roof will make contact with the ground; then, the other side will make contact; and, depending on the speed of the vehicle crash, this sequence might repeat several times. In the first impact, the vehicle's windshield and windows often break, weakening the roof structure by as much as 30 percent, which means the "far" side occupant is protected by a roof up to 30 percent weaker than the occupant on the "near" side, that hit the ground first. In real world crashes, this leads to a situation where the far seated occupant often suffers fatal injuries, while the near seated occupant walks away with only minor injuries.

NHTSA conducted 26 two-sided quasi-static tests as part of its evaluations for the January 2008 SNPRM. The agency found "the strength of the roof on the second side of some vehicles may have been increased or decreased as a result of the deformation of the first side of the roof." [15] The agency must explain in more specific detail what the implications of these results are in terms of occupant protection. The test results fail to show what happens dynamically when the first side of the roof striking the ground is followed by the second side of the roof striking the ground. This was what Congress meant to capture when it mandated NHTSA in SAFETEA-LU to "establish performance criteria to upgrade Federal Motor Vehicle Safety Standard No. 216 relating to roof strength for driver and passenger sides,"[16] to develop performance criteria that account for the different forces that are experienced on the two sides of the vehicle.

The agency has not revisited nor studied the representativeness of the pitch and roll angles used in the test. Underpinning the technical details is the core concern: making the test represent occupant risk as a result of the changing crash forces in a rollover crash. The roof structure is supported by pillars which join the roof and glazing components connected to the frame of a vehicle. They are typically described in alphabetical order from the windshield to the back window – so the front windshield supporting pillar is known as the A-pillar, the pillar that is beside the driver's seat back is known as the B-pillar, and the pillar which supports the rear windshield is the C-pillar. Some vehicles have no B-pillar, and some, like station wagons or SUVs may have a D-pillar which supports the rear glazing, and the C-pillar is behind the second row windows.

When a vehicle rolls in a real-world crash, the weight of the engine pulls the front of the vehicle down, such that much of the impact is borne by the A-pillar, which almost always causes the windshield glass to break.[17] The static test that NHTSA has been using since 1973 pushes a flat metal plate against the roof of one side of the vehicle at 5 degrees of pitch and 25 degrees of roll. This places an unrealistic burden on the B-pillar, allowing automakers to design vehicles which pass NHTSA's roof strength standard on the strength of the B-pillar, when the A-pillar

gets the brunt of the force in real-world rollovers. Without being stringently tested by NHTSA's roof crush test, A-pillars in the vehicle fleet are weak, exposing occupants to significant danger of head or neck injury in rollovers.

A dynamic test provides more realistic evaluation about the changing forces a roof experiences in a rollover crash. Use of a dynamic test would allow NHTSA to develop a performance standard of occupant protection that could include measurements of dynamics of the crash dummy. In the current static test, the dummy is not in motion, and therefore, no measurements are taken of neck deflection, or other injury potential measures that would more accurately portray risk to occupants in real crashes.

Another benefit of dynamic testing is that NHTSA could test multiple elements of rollover crashworthiness all at the same time in one test. For example, under SAFETEA-LU, Congress mandated that NHTSA initiate rulemaking on performance standards to reduce complete and partial ejection of occupants. One dynamic test standard should include rollover performance standards for safety belts, including performance of belt pretensioners, side curtain airbag performance, window glazing retention, and door locks and door retention, in addition to roof crush. NHTSA was also required to complete an upgrade of the FMVSS 206 standard, pertaining to door locks and retention. All of these elements could be tested using a dynamic test, making this type of testing efficient, as many different performance standards can be tested on the same apparatus, and theoretically, even in the same test, cutting the cost and time for the tests.

Although GM and Nissan have both recently made public new rollover test facilities, neither company has released test results to the public, so Public Citizen is unable to comment on whether or how these automakers could reconfigure existing test apparatus to test for roof strength or a comprehensive dynamic standard. NHTSA is empowered and, in fact, obligated, to investigate these test methods and assess whether they could be used for other purposes, or request test results for research purposes in developing a test that would work best for roof strength testing.

Autoliv, a major supplier of safety systems for light duty vehicles, including seat belts and airbags, commented that the static platen test may not be able to measure the response of "active" roof systems. As an alternative, Autoliv recommends that NHTSA "[e]stablish an alternate dynamic rollover test or drop test for vehicles with active roof structures." [18] Autoliv specifically cites problems with the potential for delay between subsequent tests on either side of the vehicle, stating that "[t]he duration of this test may well exceed the time in which certain active roof structures can be effective," (that is, dynamic testing).

NHTSA has since the very beginning been committed to dynamic testing. Even in 1971, the agency proposed an optional dynamic rollover test – the dolly rollover test. The agency uses dynamic tests for frontal, side, and rear impact crashworthiness tests.[i] This type of testing provides crucial information about how injuries occur, which provides automakers with information about how to design vehicles that protect occupants in real-world crashes. The automobile safety advances we've had in the past thirty years would not be possible without dynamic testing. NHTSA's opposition to dynamic rollover testing is neither scientifically based, nor is it consistent with its approach to vehicular testing.

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[i] Frontal impact protection is governed by FMVSS 208, side impact by FMVSS 214, and rear impact by FMVSS 223. In addition to these tests, FMVSS 301L and 301R are dynamic tests for fuel system integrity. FMVSS 212 is a dynamic test which assesses windshield mounting.

NEED FOR ONE UNIFIED ROLLOVER STANDARD

NHTSA needs to go back to the drawing board and re-envision its rollover crashworthiness program. Instead of tackling the rollover problem in a piecemeal way, it should issue a single, unified rollover crashworthiness standard that tackles the three elements of rollover occupant protection: prevent ejection, provide adequate restraint, and ensure that occupants are not injured or killed by an intruding roof by issuing a dynamic two-sided roof strength standard that measures occupant injury potential.

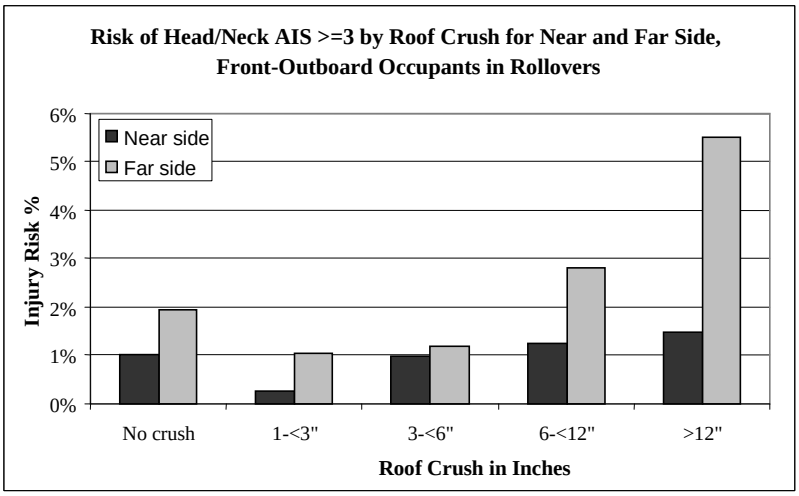
A single standard need not be more complicated or expensive to administer – and could even be more cost effective while better protecting public safety. NHTSA does it for other crash modes: frontal- and side-impact crashes are both tested in a way that considers all of the occupant protection systems at the same time. In a frontal impact crash, occupants are protected by seat belts, airbags, steering components, and front crumple zones. Testing all these systems together led to improvements in occupant protection – airbags work better when occupants are belted, steering columns collapse towards the dashboard, and front crumple zones provide crash force dispersion so that when crash forces get to the occupant they have been diminished.

Better occupant protection design doesn't happen overnight – just ask Volvo, which took considerable care in developing an SUV that took a whole-vehicle approach to safety design.

The Volvo XC90 approaches occupant protection with both crash avoidance and crashworthiness in mind. It is equipped with an electronic stability control system that includes the most state-of-the-art rollover prevention equipment available, significantly beyond the minimal system described in the 2007 NHTSA rulemaking to mandate the inclusion of electronic stability control systems in all vehicles, with the phase-in to complete for all vehicles in model year 2012. The XC90 was also designed to protect occupants in the event of a rollover. These occupant safety features include a strong roof, laminated glass in the windshield and side windows,[ii] side curtain airbags, and seat belt pretensioners. All of these features — both crash avoidance and occupant safety features — work together to make rollover crashes more survivable.

[ii] In later model years, laminated glazing was removed from side windows in the XC90 for "cost" reasons.

Far Side Occupants at Much Higher Risk from Roof Crush than Near Side



1992 to 2002 NASS/CDS Data

The Volvo can achieve a strength-to-weight (SWR) ratio of nearly 4 in the 1973 FMVSS 216 static test, which is almost three times what NHTSA currently mandates. A dynamic test of the XC90 measured an SWR of just 2, suggesting that the platen test fails to represent realistic crash forces. Most contemporary vehicles that Xprts, LLC of Santa Barbara, California has tested can barely reach an SWR of 1 in a modification of NHTSA's test, the M216 test.[iii] This also shows that manufacturers can currently "game" the system, by developing vehicles with a strong B-pillar, which bears the majority of the force in the agency's proposed platen test, rather than developing vehicles that adequately protect vehicle occupants in rollover crashes with stronger A-pillars and other features we have discussed.

The XC90 is not simply proof of the concept that safer vehicles are possible; it is also proof that safety does not have to break the bank. The total cost for upgrading a Ford Explorer to have the roof strength performance of the XC90 is a mere $81, plus one penny, per vehicle.[19]

The Volvo XC90 documents submitted by Ford Motor Company in the Duncan case in Florida several years ago are in the agency's possession, but Ford has objected to their release in the public docket. However, the agency is well aware from this information how the XC90 performed in rollover tests and how Volvo went about designing a comprehensive approach to rollover occupant protection. NHTSA should use this knowledge in developing the final rule.

SAFETEA-LU set a statutory deadline for the roof crush rulemaking to be complete by July 1, 2008. However, NHTSA may contact the Senate Committee on Commerce, Science and Transportation, and House of Representatives Committee on Energy and Commerce and request an extension. The work that NHTSA has done to meet its obligation under SAFETEA-LU is wholly inadequate. The agency needs extend the deadline for this standard and to go back to the drawing board to issue a real, life-saving, comprehensive rollover standard.

[iii] The M216 test subjects vehicles to two sequential platen tests. The platen is applied at a 10 degree pitch angle and a 25 degree roll angle for the first side, and a 40 degree roll angle for the second side. This test provides sequential measurements, which give information about the "sequential effect" – that is the difference in loading on the near versus far sides.

Electronic Stability Control

In April 2007, NHTSA issued its final rule on electronic stability control (ESC).[20] The agency has time and again praised ESC as being the biggest breakthrough in auto safety since air bags; however, at this time, there is not enough real-world data on the effectiveness of ESC. The agency estimated that ESC would prevent 71 percent of single-vehicle passenger car rollover and 84 percent of single-vehicle light truck rollover.[21]

The agency's estimates are based on a study of a broad range of vehicles that already had ESC installed by model year 2006. Electronic stability control is a blanket term for a variety of combinations of technologies, which typically use braking intervention controlled by a computer algorithm to allow the driver to maintain stability and stay on the road. Each manufacturer installs a proprietary form of ESC, or even multiple systems for different vehicles, making it difficult to estimate the effectiveness of any one system. The effectiveness of the ESC rule is likely to be less than what NHTSA estimated, due to the fact that NHTSA required an ESC system so minimal that every vehicle with ESC exceeds the technology required by NHTSA.

Furthermore, estimates of the effectiveness of ESC are irrelevant in the crashes that ESC does not prevent. If a vehicle is involved in a maneuver that overwhelms the ESC, then drivers will still lose control, leave the roadway, their vehicles will be tripped and roll over. It is for occupants in vehicles that do rollover that NHTSA must provide crashworthiness, as part of a comprehensive response.

DEFICIENCIES IN NHTSA'S RULEMAKING

Both the 2005 NPRM and 2008 SNPRM have failed to meet the requirements set by SAFETEA-LU to provide a meaningful upgrade to the 1971 standard. The proposals together have the following deficiencies:

- NHTSA's proposed test procedure has no scientific basis;
- in the two-sided tests NHTSA conducted, there was not a uniform test protocol, confounding the public and the agency from drawing meaningful conclusions from these results;
- there was no consistent limit on dummy head contact;
- the agency had no analytical basis for the first and second side tests;
- NHTSA produced no new regulatory impact analysis for the 2008 SNPRM, nor;
- did NHTSA make a specific recommendation for regulatory action.

NHTSA's 2005 NPRM Failed to Make a Substantial Upgrade.

NHTSA has failed to make a meaningful effort to upgrade the roof crush standard. It has not proposed an injury criterion for occupants in rollover crashes, nor has it upgraded the insufficient static test to account for crash dynamics in real-world rollovers.

Instead, NHTSA proposed that the static platen test be applied to a vehicle's roof at a force equal to 2.5 times the vehicle's weight, a small upgrade to the 1.5 times vehicle weight

standard that has been in effect since the 1970s.[iv] NHTSA has not attempted to account for the fact that in a real-world crash, a vehicle's roof can contact the ground several times, losing strength with each impact. NHTSA's proposed test does not account for multiple impacts. Also, the two sides of a vehicle's roof will contact the ground at different angles, but NHTSA's proposed test only applies force at one angle. NHTSA's one-sided test does not comply with Congress's mandate in SAFETEA-LU that NHTSA issue an upgrade in roof protection for both the "driver and passenger sides."

NHTSA's proposed test would retain a pitch angle of 5 degrees, which is not reflective of the pitch angle in real-world rollovers. SUVs and pickups are front-heavy and pitch forward during a rollover to an angle of 10 degrees or more. NHTSA has not published additional research about whether the pitch and roll angles are representative of real-world crash data. Through the Fatality Analysis Reporting System (FARS) and the National Automotive Sampling System (NASS), NHTSA has a wealth of data to conduct such analyses.

The proposed rule wrongly allows the strength provided by the window to be measured as part of the roof strength test. Vehicle windshields are frequently broken or separated from their bonding in rollovers, yet NHTSA's proposed test allows vehicles to be tested with windows intact, as in the 1970s standard. NHTSA has found that roof strength is reduced by about one-third after bonded windshields are broken.[22] The minimal estimated benefit – of just 13 to 44 lives – to occupants for NHTSA's 2005 proposal alone illustrates the assertion of Donald Friedman and Carl Nash in the 2001 Enhanced Safety of Vehicle Conference that FMVSS 216 "provides poor emulation of the conditions of actual rollovers that result in serious injury."[23] Friedman and Nash further explain:

> If the force of FMVSS 216 were applied at a greater roll angle, a typical roof would be as much as 30% weaker. However, a greater roll angle more accurately simulates what occurs in a real rollover.
>
> Dynamic roof loading in rollover almost always fractures or separates the windshield from its frame when the roof first contacts the ground.[v] Without the strength provided by its windshield, the roof is much more likely to deform and buckle upon its subsequent impact with the ground.[24]

The agency has subsequently learned the same lesson: it found in its two-sided testing program that roof deformation on the first side results in cracked or broken glazing, and says that "the first side test generally produces a weakening of the structure."[25]

The proposed test, which applies a slow constant force to a vehicle's roof, does not account for roof buckling as a source of injury. Yet roof intrusion occurs at speeds up to 22 mph and can cause devastating spinal and thoracic as well as head, face and neck injuries to both restrained and unrestrained occupants. The forces on a vehicle's roof during a rollover are always changing, and include lateral deformation, which cannot be replicated with a test that only pushes in a single direction. Even the two-sided static test proposed by the agency will fail to replicate the ever-changing forces across the entire roof.

[iv] The 1971 standard limited the force to 1.5 times gross vehicle weight rating (GVWR) with a 5,000 pound ceiling. At that time, many passenger cars exceeded 5,000 pounds GVWR, so they could met a standard of less than even 1.5 SWR.

[v] This is consistent with what NHTSA researchers found in the two-sided roof crush tests conducted for the SNPRM "We note that in all 26 tests, the windshield cracked before completion of the first side test." (73 FR 5487.)

NHTSA proposes to change its requirement that a roof sustain the force of 1.5 times the vehicle weight sustaining no more than five inches of roof crush to a headroom requirement. The proposed rule requires that a vehicle's roof not contact a dummy's head when crushed during testing. But the degree of roof crush, irrespective of headroom, is important in protecting occupants from ejection. If the roof of a vehicle resists more than three inches of crush, the side windows are much less likely to break, preventing ejection.[26] Also, with less roof crush, safety belts better retain their original geometry, doors are more likely to stay shut, and side curtain airbags retain their correct positioning, all of which are critical to reduce ejection potential.

The "no-head-contact" substitute requirement is flawed. Ensuring headroom during NHTSA's proposed static test does not ensure headroom in a real-world rollover, as occupants will be thrown toward the roof and within the range of roof intrusion allowed under the flawed NHTSA proposal. Worse, the proposal only requires maintenance of headroom sufficient for a 50th percentile male, neglecting taller occupants.

The proposed rule will only minimally increase roof strength. NHTSA estimated for the 2005 NPRM that the proposed standard would save at most 44 lives, or less than half of one percent of the lives lost each year in rollover crashes. Nearly 70 percent of the current vehicle fleet would require no improvement to meet the standard proposed in 2005. The agency's SNPRM, which is really just a series of options, fails to correct the problem, and the estimated costs for vehicles requiring improvement is a measly $10.61.[27]

Manufacturers can, and do, make vehicles that adequately protect occupants in rollovers. One example is the Volvo XC90, which shows good performance in real-world rollover crashes,[28] and has a 3.5 SWR and a high-strength, non-buckling, steel rollover and side impact structure. As described above, Volvo took a comprehensive, whole-vehicle approach to designing the XC90 to protect occupants in rollover - something that a dynamic NHTSA standard would encourage all manufacturers to do for *every* vehicle.

NHTSA's Supplemental Notice Fails to Improve the Deficiencies of the 2005 Proposal

The SNPRM does not serve as a replacement for the 2005 proposal, but merely adds for consideration the results of the 26 two-sided platen tests NHTSA completed.[vi] However, NHTSA leaves it up to the industry to make the case again, as it did in 1971, that a one-sided test was sufficient to measure roof strength. NHTSA solicits comments on: "the cost implications associated with different stringency requirements and different design strategies."[29] But NHTSA didn't provide a new regulatory impact analysis for its supplemental notice, making it almost impossible for commenters to provide precise feedback to the agency.

The agency's 2008 SNPRM is procedurally inadequate as it makes no specific regulatory recommendation. This is exacerbated by the absence of a regulatory impact analysis. It has not given the public enough information to assess the relative benefits of different regulatory options it lays out in the proposal, and therefore competent comment is impossible.

In spite of multiple appeals in person to agency officials, communications at congressional and agency headings, hundreds of pages of documents, and even a visit from NHTSA researchers to the Jordan Rollover System facility in California to witness a live dynamic rollover test, the agency has not fully "considered" dynamic testing for its rule. Even

[vi] The agency did not use a consistent test procedure for all the tests, which makes it impossible to compare the results of the tests.

changing from a one-sided to two-sided platen test will not accurately assess risk to occupants in rollover crashes.[vii]

In addition to not effectively addressing the need for dynamic testing, the agency has also failed to re-envision the platen test to focus primarily on occupant protection, and a key change that must be made is the "no-head-contact" requirement. The agency proposes replacing the limit of five inches of platen travel in the existing standard to a requirement that at 2.5 times SWR the roof not make contact with a 50th percentile Hybrid III male dummy. The use of a 50th percentile male dummy ignores injury potential to tall occupants, and the biofidelity of the Hybrid III dummy head for rollover has been questioned: "The human head traveled farther downward and over a longer period of time, while the Hybrid III head rebounded faster after translating downward a smaller distance."[30]

The standard should be written from an injury prevention perspective, rather than limiting inches of roof crush. The "no-head-contact" provision should be abandoned in favor of a post-crash headroom requirement that maintains a survival space around occupants. This would avoid the problem of significant variation in allowable roof crush in vehicles with different amounts of headroom. Considering the standard from this perspective would also promote the development of vehicles that protected occupants in the event of rollover.

As we have stated above, the platen test described by the agency cannot adequately predict the potential for occupant injury in real-world rollover crashes. If the agency retains inches of platen travel as a measure of injury potential in the interim while it works to develop a dynamic test for occupant protection, then it should lower the allowable intrusion and require a minimum level of residual headroom. This course of action is preferable because the agency found "positive post-crash headroom" (residual space over the occupant's head after the rollover) reduced the likelihood of suffering a roof contact injury to the head, neck, or face. This real world data shows quantifiable benefits of limiting headroom reduction."[31]

Since 1978, there have been more than 300,000 rollover fatalities. There is no excuse – Congress told NHTSA to fix this problem 17 years ago, and NHTSA has delayed and delayed. While there has been a 7.5 percent decrease in overall highway fatalities since 1991, rollover fatalities have increased almost 20 percent over the same period. This is unconscionable – NHTSA's mission is to protect Americans on the highways, and with respect to rollover crashes, the agency has been grossly negligent.

[vii] Secretary of Transportation Mary Peters was questioned by Senator Mark Pryor during the October 18, 2007 oversight hearing of the Department of Transportation held before the Senate Committee on Commerce, Science and Transportation. Senator Pryor asked Secretary Peters several questions about the roof crush rulemaking, including whether the yet-to-be-released SNPRM would include two-sided testing and whether it considered "any different types of testing." Secretary Peters responded that she believed that inquiry into different types of testing was the purpose of the SNPRM.

Results of NHTSA's Two-Sided Testing Suggest Need for More Inquiry

For the SNPRM, NHTSA conducted 26 two-sided tests.[viii] In 22 of the 26 tests, the peak force measured for the second side at five inches of platen travel was less than that of the first side, suggesting that the deformation experienced by the test on the first side changed the strength of the second side. In 4 of the 26 cases, the peak force measured for the second side was greater than that for the first side. NHTSA says "[w]e concluded that the strength of the roof on the second side of some vehicles may have been increased or decreased as a result of the deformation of the first side of the roof."[32]

The agency does not provide further explanation for why the roof strength on the second side may have increased or decreased. The auto industry has long argued that they design vehicles such that the roof strength is the same on both sides, and therefore there is no need for a two-sided test. NHTSA's conclusion that it cannot be predicted how the roof strength will change refutes the industry claim that a vehicle will performs the same on both sides in the platen test.

The results of NHTSA's two-sided testing, it concluded, justify that the agency "consider" two-sided testing. However, NHTSA was already directed by SAFETEA-LU to produce an upgrade to FMVSS 216 that "relat[es] to roof strength for driver and passenger sides." The results of NHTSA's two-sided testing confirm what observers of vehicles involved in rollover crashes could ascertain by looking at them – that the amount of intrusion is not the same on the far side. This makes a stronger recommendation to the agency than "considering" two-sided testing. The agency is now obligated to determine how to best conduct two-sided testing that estimates the risk to occupants in rollover crashes.

TWO-SIDED DYNAMIC TESTING IS POSSIBLE

The Jordan Rollover System shows that a cost-effective dynamic test is possible.

The Jordan Rollover System (JRS) is a flexible, efficient, dynamic test that can be used to test for roof crush, but can also be used to test ejection and injury potential. The device was developed by Acen Jordan and Don Friedman, a test designer and a mechanical engineer. Acen Jordan worked on the Experimental Safety Vehicle and the Research Safety Vehicle and developed test sleds that are widely used by the industry. Don Friedman worked on the Sidewinder missile development, the Lunar Rover, air bags, offset frontal crash testing and rollover crash safety, and was selected to design NHTSA's Research Safety Vehicle in a competition with large auto companies.

The way the JRS device is designed provides adequate flexibility for the agency to use the device in a number of different ways. The test is efficient, because multiple safety systems could be tested in a single test, which would reduce the burden on the agency and auto companies to conduct compliance testing. The most important element of the test device is its ability to better approximate real-world roll dynamics in a controlled manner, unlike other dynamic tests.

The JRS can be used to test roof crush resistance under a variety of metrics. Donald Friedman has conducted tests using the JRS for research purposes using a protocol that measures intrusion velocity and dynamic roof crush. The test apparatus can be used in a number of different configurations to suit whatever metric the agency chooses for a compliance

[viii] NHTSA does not provide an explanation in the SNPRM as to how it selected the 26 vehicles for two-sided testing.

standard. The agency can change the test protocol, and the basic mechanism in the test device serves to rotate the vehicle in such a way to realistically replicate rollover crashes.

A dynamic rollover test conducted on a device like the JRS could simultaneously test multiple rollover safety standards in the same test. This should include performance standards for safety belts in rollovers, including performance of belt pretensioners, side curtain airbag performance, and window glazing and door retention as well as roof crush.

The agency has a responsibility to consider a dynamic test that mirrors real-world crashes. This test has the potential to give the agency valuable information for the development of performance standards, as well as efficient compliance testing for rollover occupant protection.

The JRS can provide valuable information for the design of safer vehicles. The JRS can be configured to collect information about roll dynamics, which can then be used by manufacturers to improve vehicle design to enhance safety. As with frontal, side and rear impact crashes, the use of dynamic testing has provided industry with information that allows for the improvement of vehicle design to withstand crashes of that type. As a result, there has been a reduction in fatalities, particularly in frontal and side impact crash modes.[33]

A similar approach must be taken with respect to rollover crashes. Occupant protection, through reduced roof crush as well as ejection mitigation, would effectively reduce rollover fatalities. Vehicle design decisions must be made with the use of representative data about rollover dynamics. Improvements in vehicle design to improve performance on a test that is not representative will not serve to improve occupant safety and is a waste of resources. A dynamic test, like the JRS, can provide manufacturers with the information needed to improve occupant protection.

The information gathered from dynamic testing such as the JRS can be used to write meaningful performance standards for ejection mitigation equipment. Rollover performance of belts, side curtain airbags, window glazing, and door locks will all play a critical role in preventing ejection. This performance standard must be developed in accordance with SAFETEA-LU requirements to issue a performance standard for ejection mitigation equipment by October 1, 2009.

As part of their desperate attempt to fend off legitimate product liability litigation against them, several automobile manufacturers have challenged the validity of the JRS as a legitimate vehicle test instrument. They have inappropriately used the Daubert test defined by the Supreme Court to control the use of junk science in trials involving testimony of technical experts.

Unfortunately, some judges have acquiesced to these industry objections even though the JRS is fully based on traditional scientific principles: Newtonian physics, and analysis of rollover crash investigations and data, and the biomechanics of human injury. This has potentially affected the roof crush rulemaking in that the industry now claims that these successful challenges to the JRS demonstrate that the JRS is not an objective instrument for conducting rollover roof crush or occupant protection testing.

The Center for Injury Research (C*f*IR) has invested substantial private resources in developing and demonstrating the JRS – conducting the research that NHTSA should have been conducting over the past decade – to provide the basis for more realistic and reliable evaluation

of vehicle rollover occupant protection performance. Auto maker litigators should not be permitted to derail this important work as part of their questionable courtroom tactics, and 30 years' opposition to effective testing of occupant protection in rollover crashes.

Dynamic Test Results Using the Jordan Rollover System

A total of 81 JRS tests have been conducted by Xprts, LLC since January 2003. The Center for Auto Safety, with the support solicited of the Santos Family Foundation by Public Citizen has conducted both quasi-static (M216 two-sided tests at a 10 degree pitch angle) and dynamic tests (JRS) of the roof crush performance of the Volvo XC90. The vehicles used for the test were donated by State Farm Insurance. The XC90 performed exceptionally well in all tests, demonstrating that it has been practicable for at least the past five years to build production vehicles with adequately strong roofs, in combination with other safety features to achieve superior rollover protection. As far as we can determine, no one has been seriously injured or killed in a rollover of an XC90 in the years it has been on the highway.

When briefed on the JRS, NHTSA asked for a demonstration of repeatability of tests conducted on the JRS. The Santos Family Foundation provided support for a series of tests that were conducted on three Subaru Foresters. The result of the repeatability series showed that the tests were in agreement to at least the same degree as NHTSA's and the Insurance Institute for Highway Safety tolerances for dynamic testing: a variation of about 10 percent.[34] No other dynamic test device, specifically the CRIS system used by industry, can provide the repeatability of the JRS.

Under a new Santos Family Foundation grant, additional tests have also been conducted on three vehicles provided by State Farm that were the same models tested by NHTSA: the 2007 Toyota Camry, 2006 Hyundai Sonata and 2006 Chrysler 300. The results of these tests are that the residual roof crush for the 2.5 SWR Chrysler 300 leaves negative headroom on both JRS tests at 5.6 and 7.4 inches of residual crush at the A-pillar. By contrast the 3.2 SWR Hyundai Sonata had just 2.6 inches of residual crush[ix] at the A-pillar on the first roll. The 4.3 SWR Toyota Camry had the least residual roof intrusion on the first roll at 1.6 inches but 4.3 on the second roll. These results have been submitted to NHTSA's docket for the SNPRM.[35] Further tests of vehicles in this series are currently being conducted.

The industry is rapidly moving to adopt dynamic testing as well

The industry has recently resumed dynamic rollover testing. In the 1970s GM conducted drop tests. The Malibu tests, also conducted by GM were conducted using the FMVSS 208 dolly rollover procedure, where a vehicle is rolled off of a dolly rolling at around 30 mph.[x] Ford has conducted tests using the Controlled Rollover Impact System, in which a vehicle carried at the back of a tractor/trailer is rotated until it reaches a steady state roll before the vehicle is dropped on its roof. However, this device has been misused primarily to support the industry's claim that roof crush does not cause occupant head or neck injury.

[ix] When a vehicle is tested dynamically, there may be a larger amount of peak dynamic crush, that is the greatest extent to which the roof crushes in when in contact with the simulated road. When the vehicle is turned back upright, the roof may spring back to a small extent. The "residual" crush is the amount of roof crush that is measured after the roof springs back.

[x] The dolly rollover test was proposed as an optional requirement as part of the 1971 rulemaking, but has not been used for federal compliance testing.

Recently, the auto industry has been developing dynamic testing for purposes other than assessing roof strength. General Motors unveiled its new rollover test facility in December of 2006. The rollover tests chosen by General Motors are deliberately designed to avoid measuring roof crush. In one test, the vehicle is driven on a ramp, and then tips onto its side.[36] This test can be used to evaluate the deployment of side curtain airbags, which General Motors has publicly announced it will be installing in all its vehicles by 2012, but fails to provide any information about roof crush. Ford has also conducted dolly rollover tests of the Ford Explorer.[xi] The vehicle never fully inverts, and so the test fails to realistically represent a rollover crash. Nissan also recently announced publicly that it has developed an apparatus that is capable of fully inverting a car.[37] The stated purpose of this apparatus is to test seat belt performance.

Neither GM crash test results nor Nissan car flip results are available to the public, so Public Citizen is unable to comment on whether or how these automakers could reconfigure existing test apparatus to test for roof strength. NHTSA could investigate these test methods and assess whether they could be used for other purposes, or request test results for research purposes in developing a test that would work for roof strength testing.

ROOF CRUSH CAUSES INJURY

For more than three decades the auto industry, led by General Motors, has conducted a campaign to convince courts of law, NHTSA, and the public that "there is no relationship between roof strength and the likelihood of occupant injury given a rollover."[38] GM conducted an extensive two-part test program, referred to as Malibu I (unrestrained occupants) and Malibu II (fully belted occupants) that it claimed supported its thesis. In half of the tests of each series, the vehicles were equipped with full roll cages emulating a strong roof. However, although the company published and presented research papers making that claim, it would not release the underlying data and film until forced to do so in a major lawsuit. In fact, the company only this year released high quality, complete copies of the film recorded in these tests.

Analysis of the extensive data, film and analyses of the Malibu tests has demonstrated that in fact roof crush is directly related to neck injury which occurred only in tests of production roof Malibus. Film of these tests show definitively how these injuries are a direct result of the roof failures and that when the roofs are strong, with rollcages, the test dummies in the vehicles indicate the potential of only minor to moderate injuries from which an individual would fully recovery. We have submitted this evidence to NHTSA and attach a letter from the C*f*IR as an appendix to this testimony.

C*f*IR has conducted further research using the JRS which shows how the Hybrid III dummy which is commonly used for crash testing can be used effectively in dynamic rollover testing. They have shown that changes in neck instrumentation and the positioning of the dummy to be more like the position of actual occupants in a rollover can overcome the limitations of the Hybrid III which has a very simple neck structure that only poorly represents the complexities of the human neck. Again, these developments are discussed in detail in the C*f*IR letter to the committee.

Martha Bidez, a biomechanical engineer, has done a detailed study of the Ford Autoliv tests of the Ford Explorer. She concludes:

[xi] These tests were conducted at Autoliv ASP in Auburn Hills, Michigan on 8/10/99 (Autoliv Test B190042); 12/9/98 (AutolivTest B180219); 8/11/99 (Autoliv Test B190043); and 12/10/98 (Autoliv Test B180220).

> During each of the three FMVSS 208 dolly rollover tests of Ford Explorer SUVs, the far-side, passenger [anthropomorphic test dummies] exhibited Peak neck compression and flexion loads, which indicated a probably spinal column injury in all three tests. . . .In all three tests, objective roof/pillar deformation occurred prior to the occurrence of Peak neck loads. . .and Peak neck loads were predictive of probable spinal column injury.[39]

Dynamic testing is needed to study the dynamic motion of occupants in rollover. The role of properly functioning restraints, ejection, and biomechanical factors such as neck preflexion must be taken together to get a complete picture of occupant risk in rollover crashes.

DOCKET

The public dockets for different stages of the roof crush rulemaking have resulted in hundreds of public comments from the auto industry, public interest groups, independent engineers, legal experts, and interested citizens. With tens of thousands of affected families each year, the problems of rollover and roof crush are of significant public concern.

After the close of the docket for the 2005 NPRM, the debate didn't stop – over 100 more submissions were made from December of 2005 until the opening of the docket for the SNPRM in January 2008. These submissions provided the agency with substantial additional materials, including multiple submissions from the auto industry, as well as multiple submissions from the public interest community about dynamic testing.

Overview of additional comments from the auto industry

Additional auto industry comments to the 2005 docket can be found at docket number NHTSA-2005-22143 at the following: July 25, 2006 (#232), August 3, 2006 (#233), August 11, 2006 (#234), September 7, 2006 (#236 and #237). Public Citizen, Advocates for Highway and Auto Safety (Advocates) and the Center for Auto Safety responded with a letter on August 3, 2006 requesting a meeting to discuss these submissions.

These late submissions deal with industry objections to the proposed tie down procedure, a request for authority to use FMVSS 220 for long roofline vehicles, and concerns about low roofline vehicles. The manufacturer submissions represent several considerations that are significantly different than the proposed rule and, if incorporated into the final rule, would result in an even greater deviation from NHTSA's legal obligations. Some of these major changes would make compliance easier to achieve, because the standards to which a vehicle would comply could effectively be tailored to that vehicle, allowing more vehicles to pass — at a significant cost to public safety. Further, the late submissions of industry expose the failure of the platen test to adequately represent real-world crashes. Public Citizen has directly addressed these issues in comments to the SNPRM Docket.[40]

Overview of additional contact with public interest groups

Several meetings have occurred since the close of the 2005 docket on issues related to the need for significant revisions to the NPRM, and to reiterate the need for dynamic testing, two-sided testing. Meetings were also held with representatives from the Center for Injury Research and Xprts, LLC to present research findings of the dynamic test apparatus – the Jordan Rollover System (JRS). These meetings and comments can be found in NHTSA docket

NHTSA-2005-22143 at: October 18, 2006 (#240), February 6, 2007 (#251), May 14, 2007 (#266), August 21, 2007 (#271), September 18, 2007 (#276), January 1, 2008 (#280) and February 19, 2008 (#281).

We wish to emphasize that the agency was given ample opportunity to inquire and consider dynamic testing. However, the agency's response has thus far been to give lip service to the idea of dynamic testing, but take no steps to evaluate it. NHTSA was offered the opportunity by *Cf*IR to test a number of vehicles on its JRS or the option to buy the test device for its testing, but the agency took no initiative to do either.[xii] As a result, it has issued a 1970s SNPRM instead of an advanced, 21st century one. An Australian engineering group, which has worked on developing roof strength regulations in Australia responded to NHTSA's assessment of dynamic testing criticizing NHTSA for citing "repeatability issues [with dynamic testing] and other pseudo-science references reflect a callous preference for bureaucratic process over function."[41]

NHTSA IS ATTEMPTING TO BLOCK INJURED CONSUMERS' ACCESS TO THE COURT

NHTSA asserts in the preamble to the 2005 NPRM that its final rule should preempt state tort law jury verdicts. The agency argues that a court liability decision is equivalent to a state performance requirement for greater levels of roof crush resistance that would "frustrate the agency's objectives by upsetting the balance between efforts to increase roof strength and reduce rollover propensity."[42] Their view is a massively overbroad reading of the Supreme Court decision in *Geier v. Honda*, which provided protection from product liability litigation to an automaker who had not installed an airbag in its vehicle, where the relevant safety standard rule had given manufacturers a choice among various technologies and giving automakers that choice was seen as a key component of the rule.[43]

Given that the agency's rule, in its own estimation, will save merely seven percent of the affected population, its statements on preemption, and the risk that the agency will destroy any incentive to exceed its *de minimis* standard or to save the remaining 93 percent of affected occupants is a serious dereliction of the agency's mandate. This power grab by federal authorities would leave victims uncompensated and remove incentives to improve safety designs beyond the weak new proposed rule – imposing a ceiling on safety and stripping victims like Marcia Arreola and Patrick Parker of their right to seek compensation for harm done to them.

The agency has not made a compelling case for preemption based on any scientific or policy basis. NHTSA states a higher standard would make vehicles more rollover prone from the heavier roof; however, the Volvo XC90 far exceeds NHTSA's standard and yet is one of the safest SUVs on the road. The use of advanced high strength steels and other lightweight materials can strengthen roofs without a weight increase. NHTSA's data show the impact of weight increases on raising a vehicle's center of gravity is immeasurably small, and rollover and stability control systems can more than compensate for any small increase in weight.

NHTSA does not suggest that it would be unsafe to exceed the standard, nor does it provide penalties or disincentives when vehicles do so. NHTSA has provided no examples of vehicles with elevated rollover risks due to the weight of the roof. If rollovers are significantly more survivable because of a stronger roof, the actual risk of injury is reduced even if there is a marginal increase in rollover propensity. The tort system provides the best incentive for automakers to make design decisions that will not increase rollover propensity – an outcome

[xii] NHTSA has not made public records of any dynamic testing it has conducted if any has been conducted since it issued its ANPRM on roof crush in 2001.

NHTSA's design-neutral standard does not guarantee. NHTSA is compounding public risk by reducing automaker accountability.

When NHTSA suggests a higher standard would interfere with its "comprehensive" package of rollover safety measures, the agency gets it exactly backwards. A weak roof deforms such that the geometry of safety belts compromised, making them far less effective. Without a strong roof, side windows will shatter and allow side impact air bags to flop out through the broken window, providing little protection and increasing the risk of deadly full or partial ejection. A stronger, not a weaker, roof is required for a successful, truly comprehensive approach to rollover injury reduction.

Meanwhile, the agency's static roof crush standard fails to measure the comprehensive interaction between safety systems in a real-world rollover crash. A dynamic test comprehensively measures the safety protection from the roof, windows, doors, belts and airbags working together. The agency's main duty to Congress and the public is to improve motor vehicle safety. Because liability law enhances safety by providing continual incentives to improve, the agency's action violates its core mission.

Those in a position to prevent injury or death should be held responsible for that injury or death when they fail to act. It is far more cost-effective, and the most responsible way to reduce the number lawsuits brought against is to avert harm in the first place. Adequate regulatory protection is also the ethical duty we owe to others out of respect for human life. Victims of roof crush cases deserve justice because automakers have known for years (since the late 1960s at least) how to prevent injuries in rollover crashes but have not designed vehicles to prevent this harm. In fact, the 1928 Ford Model A had superior roof protection than today's vehicles. Instead, auto companies cut costs to maximize profits, impose gag orders to cover up harm, and lobby regulators to weaken new rules. Victims of misconduct should be fairly compensated by the perpetrator. When those who can prevent harm, yet choose not to, and then are let off the hook, they, rather than society should pick up the tab, paying medical bills and higher insurance costs, etc., caused by the wrongful actions of a few.

In addition, improved motor vehicle safety – and particularly rollover occupant protection – would have major positive economic implications. Using NHTSA's own economic estimates of the cost of injury, the more than 10,000 fatalities and more than 17,000 serious injuries cost society more than $50 billion annually. Even if building cars with strong roofs cost manufacturers as much as $100 per vehicle, that would amount to a total annual cost of only $1.5 billion, which would be more than justifiable if it only reduced rollover casualties by ten percent. In fact, appropriate changes in vehicle performance to reduce rollover casualties would save a majority of the more than $50 billion cost of these crashes.

Consumer justice attorneys stand with citizens, both the weak and the strong, to ensure that injured people are compensated by wrongdoers. NHTSA has not upgraded its "temporary" roof crush vehicle safety standard, issued in 1971, for 34 years, while the death toll from rollover crashes continued to mount at an astounding rate. In light of the egregious failure of NHTSA to protect the public many of these attorneys are calling for a substantial upgrade to the standard against their own interest, as these type of cases are a bread and butter issue for some of them. NHTSA's new proposal is deeply flawed, and will save few lives. In contrast, tort law establishes a duty of care that protects citizens when the government is too slow to act, when minimum standards are insufficient to prevent harm, or when standards are inadequately enforced. The tort system also brings to light useful information – most of the information about the harm

from roof crush, its all-too-long history and its prevention has come from cases brought by injured plaintiffs.

This rule is not the only one in which NHTSA has interfered with harmful preemption language. Attached is a list of 51 regulations or proposed regulations in which language has been included which would make it more difficult for injured parties to seek redress, of these 20 of the regulations or proposals were issued by NHTSA.

While most citizens do not have a real voice in the regulatory decisions, they do understand what is fair. Juries charged with articulating ethical standards for a community define a common sense standard for reasonable care. They cannot be lobbied by either side and are generally free of political coercion. Our reliance on the collective wisdom of ordinary people to hold companies who cause harm accountable is a crucial democratic safeguard and a fundamental right of all citizens.

CONCLUSIONS

NHTSA has not produced an adequate upgrade to FMVSS 216 to meet its mandate under SAFETEA-LU. As part of a comprehensive approach to reducing rollover fatalities, NHTSA should offer an upgrade to its roof strength standard that produces a meaningful estimation of the risk to occupants in rollover crashes from intrusion of the roof. The agency must produce a regulatory impact analysis that estimates the relative benefits of different compliance options. The Senate Committee on Commerce, Science and Transportation has the authority to agree to an extension of the rulemaking period to give the agency yet another chance to produce a roof strength proposal that protects occupants in deadly rollover crashes.

But the agency should give substantial thought to reimagining the standard. Roof strength is only part of developing comprehensive vehicle design approaches to protecting occupants in rollover crashes, which kill more than 10,000 people every year. The objective of FMVSS 216 is to prevent occupant injury by maintaining the structural integrity of the vehicle when it rolls over. Significant progress has been made in reducing injury from frontal, rear and side impact crashes with dynamic test standards. This standard should govern occupant protection from one more direction — the top. Adoption of a dynamic test would give valuable information about how occupants are injured in rollover crashes, which would in turn produce the industry, NHTSA, and the public information to design safer vehicles. A dynamic test can be used to test other elements of occupant protection, such as side curtain air bags, seat belt performance and belt pretensioners.

In the meantime, NHTSA immediately has the authority to provide consumer information through the New Car Assessment Program. It could use a modified version of the quasi-static platen test to estimate the roof strength, and provide this information, along with information on such things as whether a vehicle had rollover-triggered safety belt pretensioners and side curtain air bags, and whether a vehicle had more effective safety belt use reminders to provide a preliminary rating of the rollover occupant protection provided by current production vehicles. We will shortly make such a proposal to the agency.

Public Citizen would like to see the most expedient possible conclusion to the roof strength standard upgrade practicable; however, we support an upgrade to the standard that is significantly more protective than the existing standard. NHTSA must exercise its authority to set an extended deadline for this rulemaking, which is permitted under SAFETEA-LU, although the law mandates the standard be issued by July 1, 2008. NHTSA should go back to its 2003

plan and complete research programs into developing a more representative two-sided test for occupant protection in rollover crashes, and that research must include state-of-the-art dynamic testing.

NHTSA cannot produce a final rule until it has first returned to the drawing board and produced a notice of proposed rulemaking that outlines a two-sided testing regime that provides a scientifically-based estimate of risk to occupants in rollover crashes. This new proposal must:

- be accompanied by research for each regulatory option and an assessment of the relative life-saving, injury-averting benefits to the public from each option;
- include dynamic testing, including the possibility of using a dynamic test to assess roof performance in addition to the performance of seat belts, door locks and latches, and windows;
- protect the public, including persons not represented by a 50% male dummy, using a performance test that does its utmost to mimic real-world crash conditions while using an injury prevention metric; and
- Consider the significant benefit of combining all rollover occupant protection measures under a single comprehensive dynamic test standard resembling FMVSS 208.

In the meantime, the agency should immediately issue a consumer information standard that will allow consumers to make a meaningful assessment of the potential safety concern of vehicles on the market. This consumer information standard should include an estimate of roof strength that is based on an improved two-sided platen test, as well as highlighting other safety equipment such as belt pretensioners and side curtain airbags.

Members of the subcommittee, I thank you for this opportunity today to testify on these critical needs of children for improved motor vehicle safety. I am eager to address your questions.

[1] 36 FR 166 (January 6, 1971).
[2] National Highway Traffic Safety Administration, DOT HS 810 837. September 2007.
[3] National Transportation Safety Board, Aviation Accident Statistics. Available at http://www.ntsb.gov/aviation/Stats.htm
[4] P.L. 102-240. December 18, 1991.
[5] *See* 57 FR 242 (January 3, 1992) and 59 FR 33254 (June 28, 1994).
[6] 59 FR 33254.
[7] *See* 60 FR 43031, 43061 (August 18, 1995).
[8] P.L. 106-414. November 1, 2000.
[9] P.L. 109-59. August 10, 2005.
[10] 66 FR 53376, 53385 (October 22, 2001).
[11] 72 FR 17236, 17322 (April 6, 2007).
[12] *See* "DOT Proposes Anti-Rollover Technology for New Vehicles," Press Release. National Highway Traffic Safety Administration. September 14, 2006.
[13] 70 FR 49223, 49248 (August 23, 2005).
[14] 73 FR 5484, 5493 (January 30, 2008).
[15] *Id.* at 5487.
[16] Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), Sec. 10301(a). (P.L. 109-59).
[17] Carl Nash and Allan Paskin, "A Study of NASS Rollover Cases and the Implication for Federal Regulation." 19th Conference on the Enhanced Safety of Vehicles, 2005, Paper No. 05-0415.
[18] *See* Comments of Autoliv at Docket No. NHTSA-2008-0015, at 0079.1 (March 31, 2008), available through www.regulations.gov.
[19] *See* Erin E. Hutter, "Improving Roof Crush Performance of a Sport Utility Vehicle" (Ohio State U., 2007), NHTSA-2008-015-0005, at 63.
[20] 72 FR 17235, 17322 (April 6, 2007).
[21] *Id.* at 17236.
[22] Don Friedman, "Deficiencies of NHTSA's Current and Proposed Static, One-Sided Test of Roof Strength, FMVSS 216," at 22, (April 11, 2005).
[23] Donald Friedman and Carl Nash. "Advanced Roof Design for Rollover Protection," 17th Conference on the Enhanced Safety of Vehicles, 2001, Paper No. 01-S12-W-94.
[24] *Id.*
[25]73 FR 5487.
[26] Don Friedman, "Deficiencies of NHTSA's Current and Proposed Static, One-Sided Test of Roof Strength, FMVSS 216," at 22, (April 11, 2005).
[27] 70 FR 49225.
[28] Real-world rollover performance of an XC90 showing good structural integrity was recorded in NASS-2003-79-57.
[29] 73 FR 5490.
[30] Herbst, Brian, Stephen Forrest, *et al.*, "Fidelity of Anthropomorphic Test Dummy Necks in Rollover Accidents," 16th Conference on the Enhanced Safety of Vehicles, 1998, Paper No. 98-S9-W-20.
[31] 70 FR 49237.
[32] 73 FR 5487.
[33] *Priorities for EU Motor Vehicle Safety Design*. European Transport Safety Council. 2001.
[34] Machey, John M. and Charles L. Gauthier, *Results, Analysis and Conclusions of NHTSA's 35 MPH Frontal Crash Test Repeatability Program,* Office of Marketing Incentives, National Highway Traffic Safety Administration, Washington, D.C.: 1984. SAE 840201.
[35] *See* Submissions of Center for Auto Safety, Docket No. NHTSA-2008-0015 at 0061, 0062, and 0063. (March 27, 2008).
[36] David Shephardson, "GM to Put Rollover Bags in All Models" *Detroit News,* (December 5, 2006).
[37] Hans Greimel, "The upside of upside down: Better belts." *Automotive News.* (February 25, 2008).
[38] Robert C. Lange as quoted in *The Detroit News*, "GM, NHTSA Unfairly Treated in Series," (March 19, 2002).

[39] Martha Bidez, John E. Cochran Jr, et al, "Occupant Dynamics In Rollover Crashes: Influence of Roof Deformation and Seat Belt Performance on Probably Spinal Column Injury." *Annals of Biomedical Engineering,* Vol. 35, No. 11. (2007) pp. 1973-1988. *See* Comments of Martha Bidez at Docket No. NHTSA-2008-0015, at 0030 (March 17, 2008).
[40] *See* Comments of Public Citizen at Docket No. NHTSA-2008-0015, at 0076.1 (March 27, 2008).
[41] *See* Comments of DV Experts at Docket No. NHTSA-2008-0015, at 0010 (March 4, 2008).
[42] 70 FR 49245.
[43] *Geier v. Honda Motor Corp.* 529 U.S. 861, 884. (2000).