APPENDIX A

SUV SALES EXPLOSION INCREASES NUMBER OF ROLLOVERS, WHILE MAJOR ROLLOVER RISKS REMAIN UNADDRESSED

Explosive SUV Sales Propelling Rollover Crisis

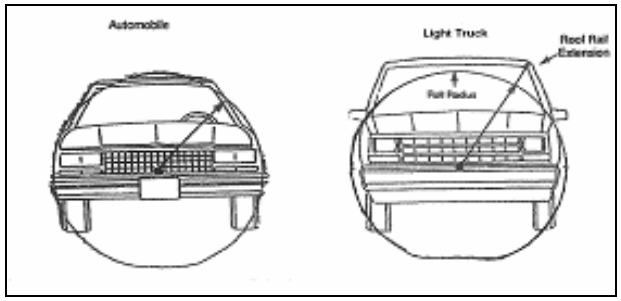
Behind the rising rollover death toll are the recent soaring sales of light trucks, particularly SUVs and pickup trucks. Light truck sales have doubled since 1983 and now are half of all vehicle sales. The market share of sport utilities has risen explosively — by a multiple of ten — since over the past three decades. In 1975, SUVs were less than 2 percent of the overall new vehicle market; in 2003, however, SUV sales alone constituted more than 23 percent of the market.[1] The engine behind this sales phenomenon is over *$9 billion* poured into advertising SUVs by automakers and dealers during the 1990s. The growth in ad spending actually eclipsed the growth rate for SUV sales.[2] Manufacturers have focused on making SUVs appeal to women, who, according to marketing data, influence 80 percent of vehicle purchases.[3]

SUV Rollover Risks High

The high frame and center of gravity and unstable design of SUVs makes rollovers particularly likely, and weak roofs and lack of crash protections make them deadly when they do occur. While 22 percent of passenger car occupant fatalities are attributable to rollover, a whopping 61 percent of SUV occupant fatalities are caused by rollover crashes.[4] NHTSA estimates that 7,000 people are killed or seriously injured when the vehicle they are in rolls over and the roof collapses into the occupant survival space.[5]

Rollovers are also particularly violent in SUVs and pickup trucks. The box-like, windowed passenger area of an SUV (called the "greenhouse"), protrudes into the air and, in a roll, hits the ground with more force due to its shape. Rolling "like a box" creates a more violent rollover crash upon impact with the ground, in comparison with the crash dynamics of passenger cars, which roll more like barrels. Centrifugal forces push passengers' heads towards the outside of the roll and into contact with the vehicle's sides and roof just as the vehicle impacts the ground, and can crush the roof inward, collapsing the survival space with deadly consequences.

Figure A-1: Hazardous Box-like Cab Structure of Light Trucks



Crash Dynamics Make Rollovers among the Most Survivable Type of Crash

In spite of the carnage that rollovers currently inflict, the specific crash dynamics of a rollover crash should make them highly survivable. The vehicle's deceleration is usually spread out over a moderately long period of time and through a series of impacts, rather than a single tremendously violent one. Because the force of the roll dissipates over time, decent crash protection could enable survival. And most rollovers are single-vehicle crashes, caused by the vehicle being "tripped" by roadside gravel, sand, curb, or an uneven road surface.

Roof Crush Continues to Be a Severe Risk to People in Rollovers

Roof integrity is the most fundamental element of occupant safety in a rollover crash. If the roof is weak, it will collapse into the cab as the vehicle rolls. Moreover, a weak roof will transmit force onto the windows as it strikes the ground, ensuring that windows break and further compromising the roof strength during subsequent rolls. Weaker roofs also transfer more force onto the doors, increasing the chances of door and door frame deformation. Both of these structural failures mean that a weak roof greatly increases the risk of ejection through a door or window.

Because of light trucks' box-like cabs, heavy weight, and weak roofs, roof crush greatly increases light truck occupant risks in a rollover crash. These heightened risks distinguish SUVs and pickups from passenger cars and in some part may account for the dramatically higher rollover fatality rates in those vehicles.

Despite the essential nature of roof integrity, the current static roof crush resistance standard is long out-of-date and severely inadequate. The standard has only been revised since 1971 to encompass vehicles with a gross vehicle weight rating (GVWR) of 6,000 pounds or less and to vehicles with raised roofs. The standard's weight limit has allowed some manufacturers to increase the weight of vehicles by marginal amounts over 6,000 pounds in order to evade the standard. A 1995 evaluation of the U.S. roof crush resistance standard by the Australian government concluded that it provided almost no enhanced protection of the occupant survival space.[6]

Endnotes

[1] U.S. Environmental Protection Agency. *Light-Duty Automobile Technology and Fuel Economy Trends: 1975 Through 2003.* (EPA 420 R03 006). Washington, DC: General Printing Office, April 2003, at 16.
[2] Bradsher, Keith. *High and Mighty: SUVs — The World's Most Dangerous Vehicles and How They Got That Way,* New York: Public Affairs, Sept. 2002, at 112.
[3] Interview with Martin Goldfarb, "Rollover: The Hidden History" *Frontline,* PBS, June 2002. <http://www.pbs.org/wgbh/pages/frontline/shows/rollover/interviews/goldfarb.html>.
[4] Jeffrey W. Runge, M.D., Administrator, National Highway Traffic Safety Administration, "Meeting the Safety Challenge" at Automotive News World Congress, Dearborn, Michigan, Jan. 14, 2003.
[5] Plungis, Jeff, and Bill Vlasic, "Feds, Big Three gird for roof showdown" *Detroit News,* April 13, 2004.
[6] Plungis, Jeff, and Bill Vlasic, "Safety test ignores real-life conditions" *Detroit News,* April 11, 2004.

APPENDIX B-1

The Sad History of Rollover Prevention – 30 Years, Thousand of Deaths and Injuries, and Still No Safety Performance Standard

Rollover crashes are responsible for a full one-third of all vehicle occupant fatalities, yet meaningful federal action to reduce these crashes has been delayed for more than three decades.

April 1973	The National Highway Traffic Safety Administration (NHTSA) issues an Advanced Notice of Proposed Rulemaking (ANPRM) on a rollover resistance standard "that would specify minimum performance requirements for the resistance of vehicles to rollover in simulations of extreme driving conditions encountered in attempting to avoid accidents." No safety standard has ever been issued.
1986	NHTSA analysis shows that rollover crashes are the most dangerous collision type for passenger vehicles.
Sept. 1986	Rep. Tim Wirth, the Chairman of the House Commerce Committee petitions NHTSA to issue a rollover standard based on Static Stability Factor (SSF) – a geometric measurement concerning the relationship between vehicle height and track width.
Dec.1987	Rep. Tim Wirth petition denied by NHTSA on the basis that SSF does not accurately predict rollover propensity. SSF was later adopted in the year 2000 as the basis for the agency's rollover resistance consumer information program, but not as a minimum safety standard.
Feb./July 1988	The Center for Auto Safety (CAS) and the Safety First Coalition (SFC) petition NHTSA to initiate a defect investigation on the highly rollover-prone Suzuki Samurai.
June1988	Consumers Union petitions NHTSA to protect occupants against "unreasonable risk of rollover."
Sept. 1988	NHTSA grants Consumers Union petition and states that it is already undertaking research into rollover safety and that the petition is consistent with the agency's "steps to address the rollover problem." NHTSA simultaneously denies the CAS and SFC petitions to investigate the Samurai
1988 -1993	NHTSA conducts an investigation and data analysis of more than 100,000 single-vehicle rollover crashes.

Oct. 1991	Congress requests report from NHTSA regarding rollover and roof crush standards (FY'92 DOT Appropriations Act, Pub. L. 102-143, S. Rept. 102-148).
Dec.1991	Congress requires NHTSA rulemaking to prevent unreasonable risk of rollover. An ANPRM or Notice of Proposed Rulemaking (NPRM) was required no later than May 31, 1992 and completion of a rulemaking action on rollover within 26 months of publication of the ANPRM. Yet Congress allowed the rulemaking to be considered completed when NHTSA either published a final rule or announced that the agency would not promulgate a rule.
Jan. 1992	NHTSA publishes an ANPRM proposing multiple options for establishing a reasonable metric baseline for acceptable rollover propensity. The ANPRM states that NHTSA is considering regulatory action to reduce the frequency of rollovers and/or the number and severity of injuries resulting from vehicle rollovers. A Technical Assessment Paper was also published discussing testing activities, results, crash data collection and data analysis (NHTSA-1996-1683-4).
April 1992	NHTSA issues Report to Congress, *Rollover Prevention and Roof Crush*, highlighting the research and its plans to address rollover prevention and survival.
Sept. 1992	NHTSA delivers the agency's planning document, *Planning Document for Rollover Prevention and Injury Mitigation*,[1] at Society of Automotive Engineers Conference, giving an overview of the rollover problem and the action NHTSA was examining to address it, including vehicle measures for rollover resistance; improved roof crush resistance to prevent head and spinal injury, and improved side window glazing and door latches to prevent occupant ejection.
June 1994	Rollover standard rulemaking terminated following a cost-benefit analysis that used out-dated late 1980s data regarding the prevalence of light trucks in the vehicle population and ignored the significant trend of increasing rollover-prone vehicles, namely SUVs, as a percentage of new vehicle sales and an increasing presence on the highway.

June 1994	Secretary of Transportation, Federico Peña, announces NHTSA's plans to substitute a "comprehensive regulatory and information strategy" for the rollover propensity standard. This strategy included 1) a safety sticker to be placed on all vehicles that includes their rollover likelihood rating (watered down following Industry complaint, it now only mentions a generic likelihood of rollover); 2) the consideration of new standards for side windows and door latches (yet to be promulgated); and 3) examination of an upgraded roof crush standard (yet to be promulgated).
July 1994	NHTSA issues a notice of rulemaking on a vehicle safety consumer information label for rollover stability.
July 1994	Advocates for Highway and Auto Safety (Advocates) and Insurance Institute for Highway Safety (IIHS) petition NHTSA to reconsider decision to terminate rulemaking on rollover standard.
Sept. 1994	Congress requires National Academy of Sciences (NAS) study of vehicle safety consumer information (FY'95 DOT Appropriations Act, Pub. L. 103-331, *see* H. Rept. 103-543, Part 1); NHTSA suspends rulemaking on vehicle rollover safety consumer information labeling until study is completed.
Aug. 1995	Responding to a 1991 ISTEA requirement that NHTSA initiate and complete a rulemaking to address "improved head impact protection from interior components of passenger cars (i.e., roof rails, pillars, and front headers)," the agency issues a final rule amending FMVSS 201 to require passenger cars and light trucks with a GVWR of 10,000 pounds or less to provide greater protection when an occupant's head hits upper interior components (such as A-pillars and side rails) during a crash. A rulemaking intended to address roof crush is thereby transformed into a rule on interior padding.
March 1996	NAS issues study of vehicle safety information, *Shopping for Safety*[2], on NHTSA's proposed consumer information program, stating that consumers need more information then they are currently provided and that a safety label, like the one currently used for displaying fuel economy, should be displayed on all new passenger vehicles sold at U.S. dealerships listing standardized safety ratings.
May 1996	NHTSA issues *Status Report for Rollover Prevention and Injury Mitigation*, with a description of NHTSA's planned development of a dynamic rollover propensity test.
June 1996	NHTSA re-opens 1994 rulemaking docket on a rollover consumer warning label.

June 1996	NHTSA denies Advocates/IIHS July 1994 petition for reconsideration of decision to terminate rulemaking on rollover preventionstandard, stating that a standard based on static vehicle measurements would eliminate a "very popular vehicle type" – the compact SUV and was not justified on cost-benefit grounds.
Aug. 1996	Consumers Union petitions NHTSA to develop a standard that would produce meaningful, comparative data on the emergency-handling characteristics of various SUVs and to provide test results to the public as consumer information.
May 1997	NHTSA grants CU petition, stating: "NHTSA will initially focus on exploring whether it can develop a practicable, repeatable and appropriate dynamic emergency handling test that assesses, among other issues, a vehicle's propensity for involvement in an on-road, untripped rollover crash."
April 1998	NHTSA issues an NPRM on a SUV rollover warning label for the vehicle visor.
Mar. 1999	NHTSA issues final rule on revised SUV rollover warning label, requiring a rollover warning sticker on the vehicle's visor or window that says "Warning: Higher Rollover Risk" and instructions to avoid abrupt maneuvers and excessive speed, and to buckle up, are written beneath the heading.
June 2000	NHTSA proposes rollover consumer information based on static stability factor (SSF) measurements as part of the agency's New Car Assessment Program (NCAP) that provides comparative vehicle performance information on the agency's Web site, but declines to require that the information be placed on the window sticker at the point-of-sale.
Oct. 23, 2000	Congress funds NAS study of NHTSA proposed rollover information rating based on SSF.
Nov. 2000	Following the Ford Explorer/ Firestone tire tragedy, Congress requires dynamic testing of vehicle rollover be added to NHTSA's consumer information rating program with testing to begin by November, 2002 (TREAD Act, Sec. 12, Pub.L. 106-414).
Jan. 2001	NHTSA begins publishing rollover ratings based on a vehicle's static stability factor (SSF) on the agency's Website.
July 2001	NHTSA issues request for comments on developing dynamic test as basis for rollover rating consumer information program beginning in 2003.

Sept. 2001	According to a Louis Harris poll commissioned by Advocates for Highway and Auto Safety, 85 percent of Americans support a federal rollover prevention minimum standard.
Feb. 2002	NAS study, *Rating System for Rollover Resistance, An Assessment*, issued. The report recommends that NHTSA expand the scope of its program, consider metrics other than stars, and develop an overall measure of vehicle safety to be integrated into the vehicle label. The NAS also points that NHTSA should evaluate the appropriateness of a rollover rating program in the absence of a minimum standard (the other consumer information ratings, for frontal and side impact crashes, reward performance above a minimum compliance standard).
Oct. 2002	NHTSA issues NPRM on dynamic test procedure for rollover consumer information.
Feb. 26, 2003	Senate Commerce Committee holds a well-publicized hearing on SUV safety where Senators, auto industry representatives, the administrator of NHTSA and spokespeople from consumer safety groups speak about the rollover prevention and survivability.
April 2003	NHTSA publishes *Characteristics of Fatal Rollover Crashes*[3] and reports the following: - Rollovers are more likely to result in fatality than other crashes are; - Rollovers constitute about one-fifth of all fatal crashes; - SUVs have the highest rollover fatality rate at 11.06 per 100,000 registered SUVs, followed by pickups at 7.52, vans at 4.09 and cars at 3.48 (for 1999).
June 2003	NHTSA issues *Initiatives to Address the Mitigation of Vehicle Rollover*[4] – reporting that rollover mitigation is one of its four major priority areas, but proposing few concrete actions or deadlines. The other three priority areas include vehicle compatibility, safety belt use and impaired.
July 2003	NHTSA issues *Motor Vehicle Traffic Crash Injury and Fatality Estimates: 2002 Annual Report*[5], finding that rollover crashes accounted for 82 percent of the total fatality increase between 2001 and 2002. The report also reveals that in 2002, 10,666 occupants were killed in rollovers – one-third of all occupant deaths.
Oct. 2003	In accordance with the TREAD mandate, NHTSA adopts a "fishhook" maneuver as the dynamic test procedure to be combined with SSF in rollover consumer information ratings and to be used beginning with its 2004 model year tests. .

Feb. 4, 2004	NHTSA issues first round of rollover ratings for 14 vehicle models and their corporate twins, based on a new dynamic test/SSF measurement. While the dynamic test provides an indication of on-road performance, the absence of a standard, or performance "floor" means that every vehicle starts with at least one star, and inflates the performance results on the tests (*i.e.*, with a two-star "floor," vehicles now earning three stars would receive substantially lower ratings).
Feb. 12, 2004	Senate passes S.1072, the Safe, Accountable, Flexible, and Efficient Transportation Equity Act of 2003 (SAFETEA 2003), which includes safety provisions concerning rollover that would: - Mandate a rollover prevention standard that would assure the improvement of the basic design characteristics of vehicles under 10,000 lbs to increase their resistance to rollover (NPRM 6-30-04, final rule not later than 18 months following NPRM); - Require the consideration of additional technologies that would increase handling and reduce the likelihood of instability(NPRM 6-30-04, final rule not later than 18 months following NPRM); and - Assign NHTSA to study Electronic Stability Control systems and report to Congress on their findings (due 12-31-05)

Endnotes

[1] Planning Document for Rollover Prevention and Injury Mitigation. Docket 91-68. No. 1. Office of Vehicle Safety Standards, Sept., 13 pp. NHTSA. 1993

[2] *Shopping for Safety: Providing consumer automotive safety information*, Transportation Research Board, National Research Council, National Academy Press, 1996.

[3] NCSA, *Characteristics of Rollover Crashes*, DOT HS 809 438, (Apr. 2002), at 14 and 20; *See also* "Registration Data for 1975-2001

[4]National Highway Traffic Safety Administration; *Initiatives to Address the Mitigation of Vehicle Rollover*., 2003. 50 IAMV NHTSA

[5] National Center for Statistics and Analysis, National Highway Traffic Safety Administration. *2002 Annual assessment of motor vehicle crashes. Motor vehicle traffic crash fatality and injury estimates for 2002*. Washington, DC: NCSA, 2003

APPENDIX B-2

1971 Roof Strength Standard – 33-Year Old Standard Does Not Provide Basic Crashworthiness Protections for Occupants in Vehicles that Rollover

The auto industry and government have known about the deadly consequences of vehicle roof crush since 1960s, yet have never upgraded the 1971 standard nor extended it to vehicles weighing more than 6,000 lbs.

July 13, 1965	Both General Motors (GM) and Ford highlight the importance of roof strength in rollovers in testimony before Congress.
Apr. 13, 1966	GM Engineering Staff memo describes the company's plans to develop a dynamic roof strength drop test from 5 ½ feet.
Aug. 1, 1966	Ford test report describes dynamic roof crush "roof drop test."
Sept. 9, 1966	President signs National Traffic and Motor Vehicle Safety Act.
Oct. 11, 1967	Federal Highway Administration (FHA) of the National Traffic Safety Bureau (NTSB) issues an Advanced Notice of Proposed Rulemaking (ANPRM) on 47 issues, including roof intrusion, seeking public comment.
Jan. 6, 1971	The National Highway Traffic Safety Administration (NHTSA, formerly NTSB), issues a Notice of Proposed Rulemaking on roof intrusion protection for passenger cars that would statically test both front corners of the roof on passenger vehicles.
Apr. 1971	General Motors Corporation (GM) and the Automobile Manufacturers Association (which later became the Alliance of Automobile Manufacturers) argued in comments to the docket that testing both sides of the roof was unnecessary. It was later revealed in litigation many years later that GM had used NHTSA's two-corner test on six of its production model vehicles and that only one vehicle tested had passed. GM nevertheless argued to NHTSA that only one side should be tested because the roof was "symmetrical," in addition to pushing for other changes to weaken the test. Moreover, GM withheld its testing results from the agency.
Dec. 8, 1971	NHTSA issues final rule establishing a roof crush standard for passenger cars to take effect in 1973. This standard, which today is virtually the same as in 1973, measure the result of pressure to only one side of a vehicle's roof.

Mar. 22, 1973	The Center for Auto Safety petitions NHTSA to apply federal motor vehicle safety standards, including the roof crush standard, to light trucks and multipurpose passenger vehicles with gross vehicle weight rating (GVWR) of 10,000 pounds or less.
Sept 1, 1973	Roof Crush Resistance standard, FMVSS No. 216, takes effect for passenger cars.
1974	NHTSA contracts with Minicars for development of a research safety vehicle that protects occupants in serious rollover crashes at 50 mph.
April 30, 1976	Engineer killed during accidental rollover at GM proving grounds during a tire evaluation test. GM institutes a new policy requiring roll cages on all test vehicles and all test drivers and test occupants to wear helmets.
Apr. 17, 1991	NHTSA issues a final rule, effective Sept. 1, 1993, extending the application of FMVSS 216, the existing car roof crush resistance standard to light trucks, vans, buses, and multipurpose passenger vehicles (MPVs) with GVWR of 6,000 lbs or less, specifically declining to extend the standard to light trucks, vans, buses and MPVs with a GVWR of up to 10,000 pounds.
Dec. 18, 1991	Intermodal Surface Transportation Efficiency Act (ISTEA) requires application of passenger car safety standards to light trucks, vans, buses, and MPVs with GVWR of 6,000 lbs or less. ISTEA also requires issuance of a standard to improve head impact protection from interior components (roof rails, pillars, and front headers) of passenger cars. ISTEA additionally directs NHTSA to commence a rulemaking proceeding on a standard to prevent rollover crashes.
Jan. 3, 1992	NHTSA issues an advanced notice of proposed rulemaking (ANPRM) to establish a rollover prevention standard, as required by ISTEA.
Sept 23, 1992	NHTSA releases *Planning Document for Rollover Prevention and Injury Mitigation* listing alternative actions agency could take to address rollover problem, including research into improved roof crush resistance to prevent head and spinal injury.
Jan. 22, 1993	NHTSA delays by one year, until Sept. 1, 1994, effective date for application of FMVSS 216, the roof crush standard to light trucks, vans, buses, and multipurpose passenger vehicles with gross vehicle weight rating of 6,000 pounds or less.
June 23, 1994	NHTSA terminates rulemaking on rollover prevention and stability standard. In the notice of termination, the agency promises that it will instead address factors involved in preventing rollover casualties, including roof strength requirements.

May 6, 1996	R. Ben Hogan, Smith and Alspaugh, PC, a law firm, petition NHTSA for rulemaking, and request that the agency require "roll cages" as standard equipment on passenger cars.
Jan. 8, 1997	NHTSA grants petition requesting rulemaking to require "roll cages."
Apr. 27, 1999	FMVSS 216, the roof crush standard procedure clarified for placement of the test device to accommodate certain vehicles that have raised and/or highly sloped roofs. This change in the standard did not address or upgrade underlying roof crush testing and strength requirements.
Sept, 2000	In wake of the exposé of Firestone tire/Ford Explorer rollover fatalities, NHTSA Administrator states that agency needs to improve roof crush safety standard for rollover protection in testimony before Congress.
Oct. 22, 2001	NHTSA publishes notice and request for comments on roof crush resistance, describing agency roof crush research and testing as a part of its rollover protection program over the past 30 years.
2002	Herbst, B., Forrest, S., Meyer, S., Hock, D. publish their "Alternative Roof Crush Resistance Testing with Production and Reinforced Roof Structures,"[1] that discusses the feasibility of a dynamic roof crush test, stating that "[t]he automotive industry and researchers have used drop testing for years to evaluate roof strength. In the late 1960s's, SAE developed a standardized procedure to perform full vehicle inverted drop testing. Many domestic and import auto manufacturers have utilized the inverted drop test technique as far back as the 1960s and 1970s to evaluate roof strength.
April 2002	NHTSA publishes its report *Characteristics of Fatal Rollover Crashes*[2] and notes that rollover crashes are more likely to be fatal than other crashes.
Sept. 17, 2002	NHTSA Administrator Dr. Jeffrey Runge states that roof crush intrusion potentially contributes to serious or fatal injury in 26 percent of rollover crashes.[3]
Feb. 26, 2003	Senate Commerce Committee holds a well-publicized hearing on SUV safety where Senators, auto industry representatives, the administrator of NHTSA and spokespeople from consumer safety groups speak about the problems of roof crush in SUV rollovers.
March 3, 2003	*Detroit News* series "Deadly Driving" highlights the failure of NHTSA to upgrade its roof strength standard and cites NHTSA data indicating that 1,400 deaths and 2,300 serious injuries could be prevented if the standard were more rigorous.

July 15, 2003	National Transportation Safety Board (NTSB) concludes roof crush contributed to severity of driver injuries and diminished passenger survivable space in Henrietta, Texas crash of 15-passenger van that killed four occupants and seriously injured eight others.
July 2003	NHTSA issues *Motor Vehicle Traffic Crash Injury and Fatality Estimates: 2002 Annual Report*, finding that rollover crashes accounted for 82 percent of the total fatality increase between 2001 and 2002. The report also reveals that in 2002, 10,666 occupants were killed in rollovers – one-third of all occupant deaths.
July, 2003	NHTSA estimates that 1,339 serious or fatal injuries caused by roof crush intrusion are suffered by belted occupants each year. NHTSA lists a proposed rule to upgrade roof crush resistance as a possible 2004 action, and final rule as a possible 2005 action, in *Vehicle Safety Rulemaking Priorities and Supporting Research 2003-2006*, with little description of a rule's possible contents No proposal for rulemaking or an upgraded standard has yet been issued.
Nov. 25, 2003	S.1978 reported out of Senate Commerce, Science and Transportation Committee containing a mandate for NHTSA to issue a dynamic roof crush standard and upgrade of rollover crashworthiness in vehicles up to 10,000 pounds.
2003 - Jan. 2004	Safety researchers at Xprts, Inc., conduct roof crush dynamic tests using the Jordan Rollover System (JRS) on Chevrolet Blazers, Chevrolet Suburbans and Ford Explorers. During the JRS tests, the roadway surface moves forward along a track, contacting the roof of the vehicle as it rotates on the spit. The test surface impacts both *sides of the roof a single time*, imitating the first roll of a vehicle in a rollover crash. The results show that while the current static test measures only the weakness of the roof, dynamic tests measure occupant injury, safety belt performance, window glazing, side impact air bags, seatback strength, and door locks and latches, as well as roof strength.
Feb. 12, 2003	Senate passes S.1072, the Highway Funding Bill, which includes safety provisions from S.1978 that would: - Require NHTSA to issue a rollover crashworthiness standard by June 30, 2006, for passenger vehicles under 10,000 lbs that will consider the prescription of a dynamic roof strength standard that realistically duplicates actual forces; - Require NHTSA consideration of improved seat structure and safety belt design (including seat belt pretensioners), side impact head protection airbags, and roof injury protection measures.

Endnotes

[1] Herbst, B., Forrest, S., Meyer, S., Hock, D., "Alternative Roof Crush Resistance Testing with Production and Reinforced Roof Structures", SAE 2002-01-2076

[2] NCSA, *Characteristics of Rollover Crashes*, DOT HS 809 438, (Apr. 2002), at 14 and 20; *See also* "Registration Data for 1975-2001

[3] Runge, Jeffrey. Speech to the 3rd Motor Vehicle Safety Symposium, United Nations University, Tokyo, Japan, September 17, 2002. < http://www.nhtsa.dot.gov/nhtsa/announce/speeches/020917Runge/UNU%20speech.doc>

APPENDIX B-3

Government Stalls on Reducing Ejections – No Standard for Windows that Reduce Ejection Door Lock Retention Standard Remains Unchanged for over 30 Years

Each year 7,300 people are killed each and nearly 8,000 are severely injured when partially or fully ejected through vehicle doors, windows and moon roofs. An estimated 1,300 lives could be saved each year by improving the strength of side and rear windows enough to retain occupants. And many of the 2,500 annual door ejection deaths could be prevented with upgraded locks and retention components that keep doors from flying open during crashes.

Jan. 1, 1968	Standard 206 - Door Locks and Door Retention Components – takes effect and is aimed at "minimizing, the likelihood of occupants being thrown from the vehicle as a result of impact."
Jan. 26, 1981	NHTSA seeks public comment on the safety advantages of advanced window glazing (the addition of materials, such as plastic, to side and rear windows to increase elasticity of windows and decrease complete breakage of window upon impact).
Aug 1988	NHTSA issues two advanced notices of proposed rulemakings (ANPRMs) on side impact protection, seeking comment on increasing resistance to occupant ejection through side widows – one for both cars and another for light trucks (SUVs, pickups and vans). NHTSA conducts testing on improved glazing materials between 1988 and 1995.
Jan. 3 1992	NHTSA publishes an ANPRM on rollover protection which included discussion of preventing ejection through glazing during rollovers.
June 1994	NHTSA cancels its proposed rule to establish a vehicle stability standard to reduce rollover crashes and promises to pursue multiple strategies to reduce occupant injury and its severity when vehicles do suffer rollovers. One of the initiatives is anti-ejection countermeasures including improved door locks and latches and window glazing.
July 1995	NHTSA holds public meeting on improvements in door latch and lock standards and asks for public comments on the issue.
Sept. 1995	NHTSA publishes final rule in 1995 extending the requirements of the 1968 door lock standard to the back doors of passenger cars and multi-purpose vehicles (hatchbacks, station wagons, SUVs, and passenger vans) after finding that weak locks are often the cause of rear doors popping open in rear crashes and killing children.

Nov. 1995	NHTSA issues "Ejection Mitigation Using Advanced Glazings: A Status Report"[1] report on positive safety effects of anti-ejection glazing.
Feb. 1, 1996	NHTSA holds public meeting on glazing and occupant ejection and to discuss the findings of the ejection mitigation status report released the previous November.
Sept. 1999	NHTSA proposes that no doors open in frontal crash testing, but at least one door should be able to be opened following the test.
Nov. 1999	NHTSA deletes proposed door retention/opening requirements.
Nov. 1999	NHTSA issues "Ejection Mitigation Using Advanced Glazing, Status Report II."[2] Findings in both the 1995 and 1999 status reports show that advanced glazing is capable of preventing approximately 1,300 fatalities per year and that feasible and practical prototypes exist.
Nov. 2000	NHTSA issues an ANPRM on safety benefits of anti-ejection glazing.
Nov. 2001	NHTSA issues a report "Ejection Mitigation Using Advanced Glazing" to Congress, reversing its previous decision that the safety benefits of advanced glazing are very high.
March 3-6, 2003	*Detroit News* series "Deadly Driving" highlights window strength and door locks/hinges as primary ways NHTSA could enhance safety. The report cites government statistics to note that between 537 and 1,305 fatalities could be prevented annually from improved side windows and that updated door latch standards could prevent hundreds of the 2,500 door-related ejection deaths each year.[3]
April 2002	NHTSA publishes its report "Characteristics of Fatal Rollover Crashes" and notes that 62 percent of occupants killed in vehicle rollovers were ejected during the crash and that only 23 percent of survivors of rollovers were ejected.
June 18, 2002	NHTSA withdraws its side glazing rulemaking notices and closes the two dockets established in 1988. The chief decision to terminate was based on the finding of an increased risk of neck injury, yet the test used to measure neck injury was problematic and non-repeatable, and onely one of a number of vehicles tested had these negative results.
Feb. 2003	NHTSA proposes development of global technical regulation governing the design and performance of door locks, latches, and retention components pursuant to the 1998 U.N. Economic Commission for Europe Global Agreement.

Feb. 26, 2003	Senate Commerce Committee holds a well publicized hearing on SUV safety where Senators, auto industry representatives, the administrator of NHTSA and spokespeople from consumer safety groups speak about the problems of ejection in SUV rollovers.
Dec. 2003	In NHTSA's 2003-2007 Priority plan, the agency promises to propose a rule upgrading door lock and latch design and performance by April 2004 and a final rule by 2005.
Feb. 12, 2004	Senate passes S.1072, the Safe, Accountable, Flexible, and Efficient Transportation Equity Act of 2003 (SAFETEA 2003), which includes safety provisions concerning ejection that would: - Mandate a standard be set to reduce occupant ejection including the consideration of advanced side glazing, side curtain airbags and side impact airbags; and (Notice of Proposed Rulemaking (NPRM) 6-30-2006, Final Rule not later than 18 months following NPRM); - Assure the creation of a standard that would require manufacturers to strengthen door locks, latches and retention components of doors to prevent occupant ejection (NPRM 6-30-2006, Final Rule not later than 18 months following NPRM).

Endnotes

[1] NHTSA Advanced Glazing Research Team; "Ejection Mitigation Using Advanced Glazing: A Status Report;" November 1995; NHTSA Docket 95-41 GR.
[2]NHTSA Advanced Glazing Research Team; "Ejection Mitigation Using Advanced Glazing, Status Report II, August 1999;" August 1999; NHTSA Docket 95-41 GR
[3] Zagaroli, Lisa; "Agency quietly rejects stronger glass standard," *The Detroit News* March 3, 2003.

APPENDIX C

NCAP-TESTED 2003 MODEL YEAR VEHICLES WITH INTEGRATED SAFETY BELTS

Key: S = Standard
A = Available

Make	Model	Integrated Seat Belt
Acura	MDX	S
BMW	3 Series	S
BMW	3 Series/M3 2-DR	S
BMW	3 Series/M3 Convertible	S
BMW	3 Series Sports Wagon	S
BMW	5 Series	S
BMW	7 Series	S
BMW	Alpina Roadster	S
BMW	X5	S
Buick	LeSabre	S
Buick	Park Avenue	S
Cadillac	CTS	S
Cadillac	De Ville	S
Cadillac	Escalade	S
Cadillac	Escalade EXT	S
Cadillac	ESV	S
Cadillac	Seville	S
Chevrolet	Avalanche	S
Chevrolet	Silverado	S
Chevrolet	Silverado Crew Cab	S
Chevrolet	Silverado ExCab	S
Chevrolet	SSR	S
Chevrolet	Suburban	S
Chevrolet	Tahoe	S
Chevrolet	Trailblazer	S
Chevrolet	Trailblazer EXT	S
Chrysler	Sebring Convertible	S
Ferrari	456 M	S
Ford	Expedition	S
Ford	Explorer	S
Ford	Explorer Sport Trac	S
Ford	F-150 ExCab	A
Ford	F-150 King Ranch Crew	S
GMC	Envoy	S
GMC	Envoy XL	S
GMC	Sierra	S
GMC	Sierra Crew Cab	S
GMC	Sierra ExCab	S
GMC	Yukon	S
GMC	Yukon XL	S
GMC	Yukon Denali	S
GMC	Yukon Denali XL	S
Honda	Insight	S
Honda	Odyssey	S
Honda	Pilot	S
Hyundai	Elantra	S
Isuzu	Ascender	S
Lexus	GX470	S
Lexus	LX470	S
Lexus	RX300	S
Lincoln	Aviator	S
Lincoln	Navigator	S
Mercedes Benz	CL-Class	S
Mercedes Benz	SL-Class Convertible	S
MINI	Cooper/ Cooper S	S
Oldsmobile	Aurora	S
Oldsmobile	Bravada	S
Pontiac	Bonneville	S
Saturn	VUE	S
Toyota	4-Runner	S
Toyota	Highlander	S
Toyota	Land Cruiser	S
Toyota	Sequoia	S
Volvo	V40	S
Volvo	V70	S
Volvo	XC70	S

Source: National Highway Traffic Safety Administration

APPENDIX D

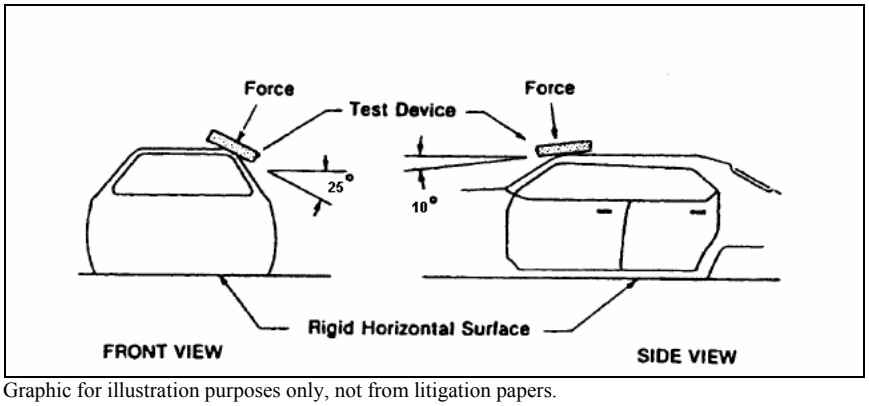
Industry Concealment of Tests Undermined Development of Meaningful Rollover Crash Roof Crush Resistance Standard in 1971

Newly released documents, now available on Public Citizen's Web site, establish how General Motors withheld information from federal safety regulators 30 years ago, just as the government was working to establish the roof crush resistance safety standard that is still on the books. The company hid internal testing results showing vehicle design failures, arguing instead for a roof crush resistance standard that it knew did not require major improvements in the roof integrity of its 1970s vehicles. This standard — still on the books after 33 years — allows vehicles to be produced and sold to consumers with roofs that crush into the passenger survival space during a rollover, severely injuring or killing people inside the vehicle.

Auto Industry Conceals Truth, as Now Revealed by Internal Company Documents

On January 6, 1971, the National Highway Safety Bureau (NHSB, which later became the National Highway Traffic Safety Administration, or NHTSA) proposed a safety standard to "reduce deaths and injuries due to the intrusion of the roof into the passenger compartment in rollover" crashes. (*See* "Roof Intrusion Protection for Passenger Cars, Proposed Rule Making," *Federal Register* 36, Jan 6, 1971, at 166.)

The agency's initial proposal was a test of both front corners of a passenger vehicle roof. Both corners would be tested by lowering a 12-inch square platen, angled forward 10 degrees horizontally and 25 degrees laterally, successively onto each front corner, increasing the force until it equaled one-and-one-half the weight of the vehicle, or 5,000 lbs., whichever was less. To pass the test, the roof could not have more than 5 inches of intrusion into the passenger compartment.



Graphic for illustration purposes only, not from litigation papers.

On April 5, 1971, General Motors and the Automobile Manufacturers Association (AMA, now re-named the Alliance of Automobile Manufacturers) submitted comments arguing for important and weakening changes to the proposed test procedures. (*See* Comments of Automobile Manufacturers Association. "Roof Intrusion Protection for Passenger Cars, Proposed Rule Making," Docket No. 2-6; Notice 4, April 5, 1971, *and* Comments of General Motors Corporation. "Roof Intrusion Protection for Passenger Cars, Proposed Rule Making," Docket No. 2-6; Notice 4, April 5, 1971.)

In its comments, the auto industry sought to weaken the standard in several key ways. The first was to change the orientation and dramatically increase the size of the platen. GM argued, on page 3, that NHTSA's proposal for a 12-inch by 12-inch platen was too small of an area of the roof to be appropriate for the test. GM urged NHTSA to substantially increase the size of the testing platen to at least 30 inches by 72 inches, to provide "a more realistic loading condition for evaluating roof strength." On the eighth page of its comments, the AMA also recommended the use of a large platen. Moreover, both GM and the AMA suggested — on the 6th and 8th pages, respectively — that the forward horizontal orientation of the platen be reduced from ten degrees to five.

Second, the industry urged NHTSA to abandon testing of both sides of the roof consecutively and to limit the test to only one side of the roof. The AMA argued that testing both sides of the vehicle roof was unnecessary. On pages 10 and 11 of its comments, the AMA asserted that "in most cases roof structure damage is distributed to only one side of the roof in an actual rollover situation." Moreover, the AMA continued, "since the upper car structure is symmetrical," the AMA wrote, "it makes no difference which side of the roof is selected for testing." On page 11 of its comments, the AMA further asserted that:

> [I]t is very questionable whether repeatable or reliable results can be obtained by testing both sides of this same roof structure system. This follows from the fact that consistent material deformation in the vicinity of the second test cannot be assured after an initial destructive test on the first side.

GM endorsed and incorporated by reference the AMA comments. Its specific proposed revisions to the agency's language of the standard suggested that NHTSA omit the testing of both sides from its test procedures. On page 10 of GM's comments, "repeat the test on the other front corner of the roof of the vehicle," has been crossed out.

The third critical item suggested by industry to weaken the standard was that, during a test, all vehicle glass should be intact, and all windows in a closed position. General Motors, on page five of its comments, inserted language stating that "[a]ll fixed glass shall be installed and moveable glass shall be in its closed position." The AMA recommended the same language on the 8th page of its comments. The trade group argued that "the status of the glass is defined to assure adequate control of potential test variables." Of course, test parameter "definition" could be equally assured by a standard that omitted glass in the windows for the purposes of the test.

NHTSA Issues Critically Flawed Roof Crush Standard

Internal documents demonstrate that GM was well aware that its vehicles had severe roof strength problems. Yet the company withheld pertinent information from NHTSA in its comments. In a General Motors meeting on May 13, 1966, GM Director of Automotive Safety Engineering confessed that "We are presently in trouble with the "A" or Number 1 (front roof-supporting) pillar. (*See* Report No. PG-21773, Lundstrom, L. C. Inter-Organization Letter, 1969 GM Safety Design Goals – Body Design – No. 1 Pillar. Detroit, General Motors, May 16, 1966, at 7.)

After publication of NHTSA's proposed roof crush standard, GM conducted roof crush resistance tests on six of its own vehicle models. The tests were done in accordance with NHTSA's proposal. Five of the six GM vehicles failed the test. GM's test report, dated March 5, 1971, concluded that "all the bodies tested failed to meet the requirements of the proposed roof intrusion requirements (Docket 2-6 Notice 4) except the X-27 body that passed. (*See* Timinsky, P.J. *Product Test Report* No. 111037. Detroit, General Motors, Mar. 5, 1971.)

In its comments to NHTSA, GM failed to mention these testing results. GM's comments instead undermined the effectiveness of the roof crush test and standard.

All three of the key industry suggestions highlighted in the previous section play a significant role in weakening the test. To address the first, increasing the size of the platen reduces the amount of force per square inch applied to a test vehicle's roof. And reducing the angle of the platen from ten to five degrees reduces the force applied to the front corner roof pillars. Yet rollover crashes combine both lateral and downward forces in a manner more similar to NHTSA's initial proposal, meaning that industry's suggested changes moved the test farther away from the crash impacts in real-world rollover crashes.

GM was likely aware of these implications — in 1966, it had internally recommended a roof crush drop test in which the impact surface was at a far sharper angle, relative to the front horizontal orientation of the vehicle roof — the opposite of its recommendations to NHTSA in 1971. (*See* Lundstrom, L. C. Inter-Organization Letter. Subject: Design Goals for Safety. Detroit, General Motors, April 19, 1966, at 5.)

Secondly, while both GM and the AMA argued against testing both sides of the roof due to the roof's alleged symmetry, the dynamics of real-world rollover crashes are far from symmetrical in their impacts on the roof. A consecutive test for both corners is critical because the initial impact on the roof in a rollover crash substantially degrades the integrity of the roof structure, meaning that the "second impact" is far more devastating than the first, and usually at a more lateral angle than the initial impact.

In fact, real-world rollover injuries show that people seated beneath the corner of the "second impact" on the roof are the ones most often killed or severely injured. While the first impact can be glancing, the second impact occurs after the initial integrity of the roof has been severally degraded by the crash. Therefore, the strength of the roof's second corner – in a consecutive test scenario – is fundamental to preventing deadly roof collapse.

Third, the industry's argument that defining test parameters should lead NHTSA to allow windshields and windows to remain intact for the test has led to a dangerous over-reliance by manufacturers on the strength of window bonding to pass the test. Yet in a real-world rollover crash, the glass breaks after the initial (first corner) impact. *When the windshield shatters at first impact, roof strength can decrease by as much as one-third.* Testing only one side of a vehicle's roof with the glass intact allows the measure of roof integrity to be enhanced by the initial influence of the glass, a protection that real-world rollover victims are stripped of in an actual crash.

At least as early as 1966, GM also knew of the influence that windows have in improving roof strength ratings. "Retention of the windshield is advantageous in the event of a roll-over due to the added strength," noted C. W. Gadd of GM Research Laboratories, to colleagues at an internal meeting in 1966. (Report No. PG-21773; Lundstrom, L. C. Inter-Organization Letter. Subject: 1969 GM Safety Design Goals – Body Design – No. 1 Pillar. Detroit, General Motors, May 16, 1966, at 9.)

Without the benefit of the industry's crash test information showing a massive failure to meet the proposed test, NHTSA published its roof crush resistance standard, Motor Vehicle Safety Standard 216, in December of 1971. The final standard reflects, almost without change, the modifications to the rule that had been suggested by GM and the AMA. (*See* "Part 571 — Motor Vehicle Safety Standards," *Federal Register* 36, Dec. 8, 1971, at 23299-23300.)

The standard, which remains in effect today, requires the use of a flat platen 30 inches by 72 inches in dimensions, positioned at a forward angle of five degrees below the horizontal — exactly as GM requested. The rule requires that all vehicle glass be installed and all glass windows closed. In addition, it requires that only one side of the vehicle roof be tested. The death toll from roof crush alone now totals some 7,000 people a year— meaning that tens of thousands, if not hundreds of thousands, of people have unnecessarily died over the past three decades from this flimsy standard, and the lack of protection that it offers occupants in an actual rollover crash.

Ford

AUTOMOTIVE SAFETY RESEARCH OFFICE

SAFETY ENGINEERING EVALUATION

Intra Company

. ENGINEERING STAFF

July 8, 1968

Mr. H. G. Brilmyer

From: Mr. J. R. Weaver

Subject: Roof Strength

CONCLUSIONS

1. Based on a statistical analysis of accident data, the amount of roof damage has little effect upon the severity of injuries sustained by unrestrained occupants.

2. Roof intrusion may have a more pronounced effect on occupant injuries with increased usage of upper torso restraints.

3. Roof intrusion to 29.4 inches above the "H" point will not interfere with the "depressed head" space of 99% of vehicle occupants.

4. Maximum roof strength in company passenger cars is presently in the 2000 lb (convertible) to 6500 lb (4-door sedan) range.

RECOMMENDATIONS

1. The static roof crush test should be adopted as the standard method of testing roof strength.

2. When subjected to a roof crush test, all passenger vehicles should withstand a load equal to twice the curb weight of the vehicle with maximum roof intrusion to within 29.4 inches vertically above the "H" point.

DISCUSSION

A. Rollover Accident Data

A review of traffic accident data was undertaken to determine the number of accidents involving roof damage and the relationship, if any, between roof collapse and occupant injuries. In an ACIR report of rural personal injury accidents, the roof was the principal area of impact 24% of the time (Reference 1). Unfortunately, the percentage cannot be extrapolated to the national level but it does indicate that the incidence of roof impact is significant.

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In a study of 15 recent injury producing rollover accidents in Washtenaw County (Reference 2.), one of the 26 occupants sustained injuries due to roof collapse. For all other occupants, "injury could not be related to the degree of roof collapse".

In a report by Huelke and Gikas (Reference 3) of 139 fatal accidents, 9 occupants died from roof contact. Four of these deaths involved roof-into-tree impact resulting in total roof collapse. A fifth death involved a bizarre roof-to-roof impact between an airborn, inverted car and an oncoming car. The remaining four deaths were from off road, rollover without collision accidents with roof collapse ranging from ~ in. to total collapse. In all but two of these nine cases, the roof was collapsed to the belt line or below.

An extensive statistical study was performed on the company ACIR* file of 1601 rollover without collision accidents. This study is discussed at length in the Appendix. The results of the study indicate:

1. The amount of roof damage has little effect upon the severity of occupant injuries.

2. Belted occupants sustain slightly more severe injuries than unbelted, non-ejected occupants.

The preceding is a summary of available rollover accident statistics from which only some very basic conclusions can be drawn:

1. A significant number of accidents result in roof damage.

2. People <u>are</u> injured by roof collapse. The total number of nationwide deaths and injuries cannot be estimated but it is a significant number.

3. In rollover accidents, roof structure impacts not only the ground, but fixed objects (trees, guard rails, etc.).

B. Upper Torso Restraints

Upper torso restraints are mandatory on passenger vehicles in 1968. At present, their usage is rare. It is expected that in time they will become more widely used and more effective. For protection from forward and side impact, an upper torso restraint system should hold the wearer in an upright or slightly jackknifed position. The Ford "inverted Y" harness, race car "H" harnesses and "X" harnesses are examples of very effective upper torso restraints.

It is obvious that occupants that are restrained in upright positions are more susceptible to injury from a collapsing roof than unrestrained occupants who are free to tumble about the interior of the vehicle. It seems unjust to penalize people wearing effective restraint systems by exposing them to more severe rollover injuries than they might expect with no restraints.

*Automotive Crash Injury Research of Cornell University

C. Head Clearance

The occupant population head height and selected interior roof heights are shown in Figure 1. The top of head curve was obtained from Reference 4 and the vehicle dimensions from Reference 5. The measured vehicle dimensions were adjusted to vertical dimensions (the measurement is taken 8° from vertical). The depressed head location is based on the assumption that occupants can comfortably lower their head height 2 inches without moving their shoulders.

From Figure 1 it can be seen that allowing roof collapse to 28.7 inches above the H-point would not interfere with the depressed head height of 95% of the population. In a Mustang 2+2 this would allow 4 inches of vertical roof crush. To clear 99% of the population the allowable crush would be reduced by 0.6 inches.

D. Roof Strength Tests

Rollover accidents involve very complex vehicle kinematics. Cars can roll about longitudinal and transverse axes while spinning about a vertical axis. The vehicle roof may strike a fixed object, the ground, another vehicle or nothing at all. There just is no such thing as a "typical" rollover accident. For this reason, it is difficult to specify a test which will simulate a typical rollover accident.

There is at present no government specification pertaining to roof strength or methods for testing it. The SAE Recommended Practice contains specifications for three different roof tests (J857); a hill roll, a ramp roll and broadslide rollover. Ford has used two additional roof tests; a drop test and a ramp rollover employing a curved tracking rail. Recently, Ford and GM have used a static roof crush test.

All of the rollover tests have serious deficiencies. The broadslide test seldom results in rollover and the curved rail ramp roll seldom results in roof damage; the hill roll is cumbersome and probably not severe enough; the SAE ramp roll is time consuming and the vehicle often misses the ramp. In all the rollover tests the roof is loaded by the weight of the vehicle and in all but the hill roll, the vehicle is towed at 50 mph prior to rollover. The test vehicle must be a complete car with running gear intact.

The roof drop test can use partial or damaged vehicles as test items. But like the rollover tests, this test does not yield roof strength data. The roof deformation is measured but the forces producing that deformation are not. Furthermore, there is considerable variability in the results (Reference 6).

The static roof crush test does not attempt to simulate rollover accidents but does test roof strength. This test yields both the load applied to the roof and the resulting roof deformation. The test item can be a body-in-white or a complete vehicle. The roof crush test is superior to the other roof tests for measuring improvements in roof structure. Some results from roof crush tests are shown in Figure 2. In these tests, the load was applied by a hydraulic ram at the upper left corner of the windshield. The direction of the load was 25° from the vertical in a front view of the vehicle and tilted 5° forward. The roof deformation was measured in the direction of the applied load.

EAA-0281

E. Roof Forces

In many rollover accidents, the vehicle comes to rest on its roof. This fact provides a starting point in developing a roof strength standard: roof structure must support the weight of the vehicle. If we now assume that the vehicle is suspended with the roof just touching the ground and suddenly released, the load factor is, conservatively, two or twice the weight of the vehicle. In some cases the vehicle is several feet in the air prior to impacting the roof but these cases, like the 60 mph head-on collision, are so severe that the basic design of the vehicle would have to be altered to withstand the impact. It is felt that a loading of twice the weight of the vehicle:

1. is frequently experienced by vehicles in rollover accidents
2. is attainable as a minimum roof strength without altering basic roof design.

Existing roof strength is in the range of .5 to 1.5 times the weight of the vehicle (Figure 2).

J. R. Weaver
Safety Engineering

bf
Attach.

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APPENDIX F

THE BIPARTISAN MCCAIN-HOLLINGS VEHICLE SAFETY PROVISIONS IN S.1072, THE SAFE, ACCOUNTABLE, FLEXIBLE, AND EFFICIENT TRANSPORTATION EQUITY ACT OF 2003 (SAFETEA), WILL PREVENT THOUSANDS OF NEEDLESS DEATHS ON THE HIGHWAY EACH YEAR

Vehicle crashes are the leading cause of death for Americans from 2 to 33, causing nearly 42,000 deaths and 3 million injuries each year. The numbers of Americans killed on the road remains at an unconscionable historic level. The National Highway Traffic Safety Administration (NHTSA) estimates the direct cost in worker productivity and other economic losses from vehicle crashes is $230 billion each year (in 2000 dollars), or $820 for every man, woman and child in the U.S.

The problem is only getting worse. In 2002, highway deaths reached their highest level since 1990, and an astounding 82 percent of the increase in deaths between 2001 and 2002 occurred in rollover crashes. SUVs, pickups and vans now make up 49 percent of new passenger sales and 36 percent of registered motor vehicles – a 70 percent increase between 1990 and 2000. Although NHTSA and the auto industry have known about the dangers of vehicle rollover and aggressivity for several decades, safety rules continue to lag behind these market trends.

Yet federal regulators acknowledge that the number of lives lost is far too high. Dr. Jeffrey Runge, Administrator of NHTSA, predicted last year in *Newsday* that the total dead could reach *50,000 annually* in 2008. "This is a Vietnam War every year," he said. "That's just not tolerable."

In 2000, Congress quickly passed the TREAD Act in the wake of the Ford/Firestone tragedy – but as members stated on the floor, major vehicle safety issues would have to be revisited. That bill, and NHTSA's subsequent tire recall, did not address increasing hazards from the growing popularity of SUVs. Left unattended, as they have been for more than two decades, rollover crashes and crashes involving vehicle mismatch will claim more lives each year. But SUVs need not be so dangerous for occupants and others—technologies available in numerous vehicles currently on the market support a panoply of obvious fixes to build a better, safer SUV for American families.

The bipartisan safety provisions in S.1072, sponsored by Senators John McCain (R-Ariz.) and Ernest Hollings (D-S.C.), will complete the unfinished business of TREAD. Hundreds of SUV owners who signed up for our campaign at www.betterSUV.org believe that American automakers *can* build a safer vehicle. So do the Ford/Firestone survivors, who have testified to the tragedies in their lives – dealing with the wrenching deaths of family members and ongoing pain from serious injuries. Yet millions of dangerous vehicles remain on the highway. Many of these losses need not have occurred and were readily preventable with improved safety design. It is time to make a better SUV.

SAFETEA PROVISIONS WILL SAVE LIVES BY ADDRESSING KEY VEHICLE SAFETY GAPS

Preventing Devastating Rollover Crashes

The diagnosis: Rollovers cause approximately 10,000 fatalities – a full one-third of all vehicle occupant deaths – and 21,000 serious injuries each year. These injuries include serious brain damage, quadriplegia, paraplegia, and other severe disabilities. Currently, there is no minimum standard to set a floor for rollover stability, though the federal government first considered such a standard more than 40 years ago.

The right medicine in SAFETEA:

- A rollover resistance standard that will require design improvements in the tippiest vehicles and support the use and further development of technologies to improve roll resistance and vehicle handling.

Treating the Deadly Epidemic of Roof Crush and Improving Rollover Survivability

The diagnosis: The current roof crush standard is woefully out of date – watered down prior to being issued in 1973 and adopted over automaker protest, it tests just one side of the roof and passes vehicles that with roofs that collapse and kill occupants in real crashes on the highway. NHTSA estimates 3,700 belted passengers are killed each year by collapsing roofs and a more rigorous roof-crush standard would save 1,400 people. Its estimate is likely too low: it excludes occupants who are ejected when roof crush opens ejection portals, as well as occupants killed by roof collapse before being ejected. And, although rollovers remain one of the most survivable crash types, inadequate crash protection standards or lack of safeguards make rollovers unnecessarily deadly crashes, exposing people to seat failure, safety belt failure and ejection.

The right medicine in SAFETEA:

- A roof strength dynamic test standard to prevent extensive roof collapse, which can measure injuries to people in evolving crash situations and test safety belt performance in rollovers.
- A rollover crashworthiness standard, including improved seat structure, safety belt design (with safety belt pretensioners that tighten in a rollover crash), side impact airbags and roof padding protection, all of which will dramatically increase rollover survivability.

Reducing Ejections from Vehicles through Windows and Doors

The diagnosis: Approximately 13,000 fatalities each year involve ejection: 8,000 people are ejected through windows, while 2,500 are ejected through open doors. NHTSA estimates that stronger side windows would save between 537 to 1,305 people each year and that stronger door locks and latches would prevent hundreds of deaths annually.

The right medicine in SAFETEA:

- An ejection mitigation standard using a combination of safety technologies, including advanced safety window glazing, side window curtain airbags and side impact airbags.
- An upgraded door lock and retention standard to reduce door openings in rollovers and other crashes and prevent ejection.
- These protections work in combination with other S.1978 standards: stronger roofs, rollover-pretensioned belts and improved belt-usage systems and reminders.

Addressing Vehicle Mismatch to Level the Playing Field

The diagnosis: Studies of real-world crashes by NHTSA show that crashes between passenger cars and light trucks are taking a record toll in lives. Automakers have promised to address the issue three times: once in 1998, again in 2000, and most recently in a well-publicized but vague voluntary program in 2003. Yet the destruction caused to passenger cars struck by SUVs requires a public and certain cure. Voluntary campaigns provide little accountability should manufacturers renege, as they did in 1998 and 2000, or fail to comply due to economic fluctuations. Moreover, consumers deserve information that allows them to make ethical choices when buying a vehicle.

The right medicine in SAFETEA:

- A vehicle compatibility and aggressivity reduction standard addressing bumper height, weight and other compatibility characteristics.
- A consumer information program to rate vehicles according to aggressivity and compatibility in multiple-vehicle collisions.
- An upgrade of the side and frontal impact standards to ensure that vehicle design also protects occupants who are inside both the struck and striking vehicle.

Fixing the Needlessly Deadly 15-Passenger Van

The diagnosis: Between 1990 and 2000, 864 occupants of 15-passenger vans died in crashes. Fatal single-vehicle crashes involving 15-passenger vans are 19 percent more likely to have included a rollover than crashes involving a car. The vans fall outside of the scope of many federal motor vehicle safety standards, such as roof crush, head restraints, braking systems and rollover warning labels. These vans also are not tested by the New Car Assessment Program (NCAP), so consumers have no idea of their crash or rollover ratings. Many innocent passengers have no idea that these vehicles are deadly, particularly when carrying more than 5 occupants.

The right medicine: A **SAFETEA** provision sponsored by Sen. Olympia Snowe (R.-Maine) would include 15-passenger vans in all relevant safety standards for occupant protection and vehicle crash avoidance, in NHTSA's dynamic rollover testing program, in NHTSA's NCAP program, and, for those vans used in commercial purposes, in all relevant truck safety standards and regulations.

Other Key Measures

Increasing Safety Belt Use: NHTSA estimates that 12,144 lives were saved by safety belts alone in 2001, and wearing a safety belt reduces a person's risk of dying in a crash by 50 percent. Current law prohibits a regulation for an audible reminder longer than 8 seconds, though Ford and other companies have tested superior reminders. The safety provisions in **SAFETEA** would allow new and innovative safety belt reminder systems that will increase belt usage.

Saving Children Killed by Vehicle Backover: According to news reports, 58 children were killed by being accidentally backed over, usually by family members, in 2002 and at least 72 were killed in 2003. There is no reason for these tragedies which devastate families.

SAFETEA would mandate a backover avoidance study and assess technologies that let drivers know when a child is behind the vehicle. The bill also suggests that NHTSA collect basic data on the number and types of non-traffic vehicular deaths and injuries.

Saving the Forgotten Child with Child Restraints: The greatest risk to child passengers ages 4- to 8-years old is the lack of restraint use in a motor vehicle. These children, as well as younger children, should be protected by booster seats to prevent serious spinal and other injuries.

SAFETEA would establish a state-based grant incentive program for booster seats.