Statement before the US House Committee on Energy and Commerce, Subcommittee on Commerce, Trade, and Consumer Protection

Emerging vehicle safety issues

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The Insurance Institute for Highway Safety (IIHS) is a nonprofit research and communications organization that identifies ways to reduce deaths, injuries, and property damage on our nation's highways. We are sponsored by US automobile insurers. Thank you for inviting IIHS to testify on the research and rulemaking priorities of the National Highway Traffic Safety Administration (NHTSA).

More research is needed

Research is key to developing sound federal motor vehicle safety standards and highway safety programs. With this in mind, NHTSA needs to expand its research toward improving vehicle crashworthiness, evaluating emerging crash avoidance features, and developing technology to reduce alcohol-impaired driving. The agency also should increase the scope of its detailed database on crashes.

Vehicle crashworthiness

More work is needed to identify the types of crashes in which people are dying and to develop new tests to reduce injuries in such crashes. Since 1995 IIHS has been evaluating vehicles in 40 mph frontal crash tests, which have led to vehicle design improvements.[1] We have compared the real-world experience of vehicles with good versus poor performance in our frontal tests, finding that good performers had lower fatality rates.[2] Offsetting these improvements, however, are increases in travel speeds, cellphone use, and (until recently) miles traveled, so about 29,000 people still died in passenger vehicle crashes in 2007.

IIHS research shows that serious injuries and deaths still are occurring in frontal crashes of vehicles that are good performers in our frontal offset tests. We have identified 5 types of frontal crashes in which people continue to be injured or killed. These include full-width crashes similar to NHTSA's 35 mph consumer test, moderate overlap offset crashes like IIHS's, offsets with smaller overlap than the IIHS test, centerline impacts with narrow objects like poles, and truck underride crashes. We are developing objective, repeatable tests that will duplicate the types of damage that occur in pole and other small overlap impacts,[3] and NHTSA needs to conduct research on other crash modes. We also believe improvements to the existing federal standard on rear underride guards for large trucks and trailers can reduce injuries in passenger vehicles that strike trucks (see page 3).

Crash avoidance technology

Manufacturers are equipping passenger vehicles with an array of crash avoidance features including the 5 described below. Using 2002-06 crash data, IIHS has estimated the maximum number of crashes that potentially can be prevented by each feature.[4] We also are looking at real-world crash and insurance data and surveying the public about acceptance of the features. NHTSA is doing similar work, which should be expanded as new features are introduced in both passenger vehicles and large trucks. This will enable the public and vehicle manufacturers to learn quickly which systems are effective and which are not.

Technology	Description	All relevant crashes	Fatal crashes
Forward collision warning with automatic braking	Prevents or mitigates frontal crashes by alerting drivers of emergencies and, in some cases, automatically applying brakes	2,268,000	7,166
Emergency brake assistance	Prevents or mitigates frontal crashes by detecting panic braking, readying brakes, and/or boosting brake pressure	417,000	3,079
Lane departure warning	Alerts drivers who begin to stray from lane	483,000	10,345
Blind zone detection	Warns drivers of vehicles in adjacent lanes	457,000	428
Adaptive headlights	Improves night vision around corners/curves	143,000	2,553
Total unique crashes		**3,435,000**	**20,777**

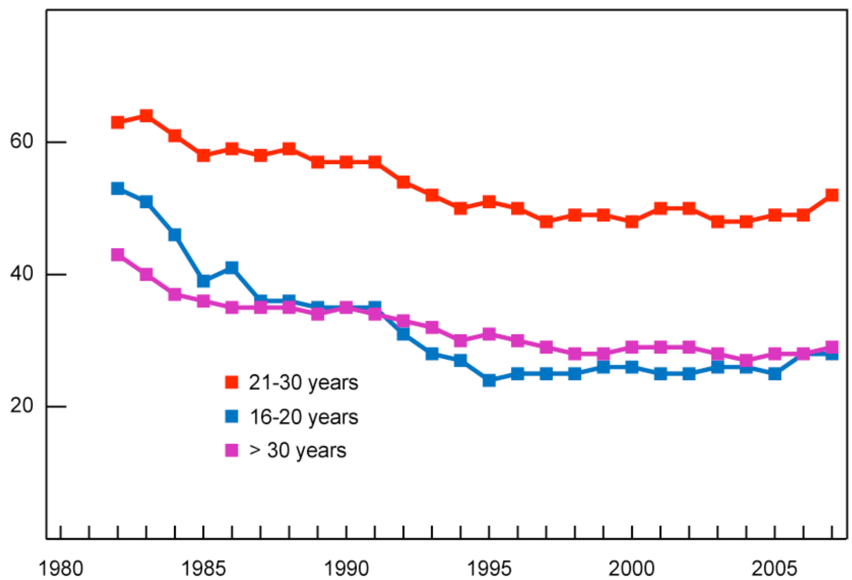
Note: Totals are not the sums of counts in each column because some crashes are relevant to more than 1 of the 5 technologies.

Note: Estimates are based on ideal versions of the crash avoidance features and thus may overstate the real-world benefits. As we gather more information on the actual field performance of the crash avoidance systems that manufacturers are installing in their vehicles, IIHS will be able to refine these estimates.

Alcohol ignition interlock

Important progress in the 1980s toward reducing deaths related to alcohol-impaired driving began to level off in the 1990s. Proven techniques such as the use of sobriety checkpoints could lead to further reductions in this problem, but we also need to find new ways to address it. NHTSA and the Alliance of Automobile Manufacturers have embarked on a joint program to evaluate the possibility of creating alcohol ignition interlocks that can be built into vehicles so motorists can be screened each time they get ready to drive. This technology is promising, and the agency should continue its feasibility research. IIHS estimates that nearly 9,000 deaths in crashes could have been prevented in 2007 alone if drivers with blood alcohol concentrations of 0.08 g/dl or higher had been prevented from starting their vehicles.

Percent of fatally injured passenger vehicle drivers with BACs ≥0.08 g/dl, by driver age, 1982-2007



National Automotive Sampling System/Crashworthiness Data System

Finding ways to reduce crash deaths and injuries begins with collecting comprehensive data of good quality that identify the drivers, vehicles, and environmental factors contributing to crashes and injuries. In 1979 NHTSA set up the National Accident Sampling System, now called the National Automotive Sampling System/Crashworthiness Data System (NASS/CDS), to collect information based on in-depth crash investigations. Originally scheduled to involve teams investigating crashes at 75 locations nationwide, NASS/CDS includes only 24 locations. Teams investigate about 5,000 crashes annually, and this number produces an inadequate sample for many applications. For example, it takes too many years for key questions about the effectiveness of various safety features to be addressed.

Because NASS/CDS data are critical to our understanding of crash problems, NHTSA should increase the number of crashes being investigated. Particular attention should be paid to crashes involving child injuries so we can figure out what is causing them. NASS/CDS also should be expanded to include information on any crash avoidance features in the vehicles being investigated. This would assist in evaluating such features.

Injury biomechanics
Researchers use NASS/CDS data for a variety of purposes, including to gather information on the injury tolerances of occupants who differ in age and size. For example, many existing injury criteria set for children are based on scaled-down versions of adult criteria because information is lacking about injury tolerances for children's heads, necks, and abdomens. NHTSA is funding some research on child injuries and holding meetings to share information and coordinate research with others including the Children's Hospital of Philadelphia, University of Michigan Transportation Research Institute, and vehicle and restraint manufacturers. This work should be expanded and accelerated.

Chest injuries often are serious and even fatal. The current NHTSA standard for frontal crash protection sets limits on the acceleration of the chest and on the amount of chest deflection. The state of knowledge of chest injury risk has advanced considerably beyond what is reflected in current injury limits. Plus the Hybrid III crash test dummy long has been criticized for not representing human chest injury particularly well. Advances in knowledge should be reflected in the injury criteria and test dummies NHTSA uses.

NHTSA Rulemaking

Truck underride: Crashes involving large trucks resulted in 4,602 deaths in 2007. Twenty-three percent of all passenger vehicle occupant deaths in multiple-vehicle crashes during 2007 occurred in collisions with large trucks.[5] We have known for years that many of these deaths occur when passenger vehicles underride the fronts, backs, or sides of trucks or trailers. For example, a 1997 IIHS study estimated that underride occurred in half of all fatal crashes between large trucks and passenger vehicles.[6]

It took NHTSA nearly 40 years to upgrade the standard covering truck underride guards (see attachment), and the 1996 standard still falls far short of ideal. It allows rear impact guards on new trucks and trailers to be too high off the ground to fully engage the front ends of passenger cars,[7] and it does nothing to prevent underride in front or side crashes. The Canadian standard requires stronger underride guards than in the United States.[8] Research in Europe[9-10] has investigated front underride guards, and the United Nations Economic Commission for Europe Regulation 93 requires such guards.[11] NHTSA also should require adequate front, side, and rear underride guards on new tractors and trailers.

Fuel economy and vehicle safety: IIHS has long been involved in discussions about how to improve fuel economy while preserving occupant safety. The conflict is that small vehicles use less fuel but do a relatively poor job of protecting their occupants in crashes. Thus, fuel conservation policies that encourage vehicle downsizing have tended to conflict with motor vehicle safety policies. But they do not have to.

More than 30 years have elapsed since Congress enacted the Energy Policy and Conservation Act of 1975, which required manufacturers to build cars that use less fuel. The result during the first 15 or so years of this law was to improve the overall fuel economy of the US car fleet by about 75 percent. The main way automakers achieved this was by reducing car weight. For example, Chrysler stopped making big cars altogether. By 1985 cars were an average of 500 pounds lighter than they would have been without the federal requirements. The downside was to increase fatality risk in crashes. Multiple studies document this, including IIHS research comparing deaths in Ford and General Motors cars before and after they were downsized during 1977-86. The finding was a 23 percent increase in deaths per 10,000 registered cars.[12]

Subsequent research documents the continuing loss of life. For example, the National Research Council concluded in 2002 that 1,300 to 2,600 additional crash deaths occurred in 1993 because of vehicle weight reductions to comply with federal standards.[13] A problem with the structure of the original fuel economy standards for cars was that the target of 27.5 miles per gallon was applied to an automaker's whole fleet, no matter the mix of cars an individual automakers sells. This has encouraged manufacturers to sell more smaller, lighter cars to offset the fuel consumed by their bigger, heavier models. Sometimes automakers even sell smaller, and less safe, cars at a loss to ensure compliance with fleetwide requirements.

In 2006 NHTSA adopted a fuel economy system for SUVs, pickup trucks, and vans that mandates lower fuel consumption as vehicles get smaller and lighter. The result is to remove the incentive for automakers to downsize their lightest vehicles. The new system also forces manufacturers to use vehicle and engine technology to improve fuel economy.

The Energy Independence and Security Act amends the 1975 law by requiring fuel economy standards for 2011-20 models to be set to ensure an industry-wide average of 35 miles per gallon by 2020 for all new passenger vehicles combined (that is, different standards no longer will apply to cars and light trucks). This law authorizes NHTSA to use a size-based system for both cars and light trucks, and the agency's new (March 2009) standard for 2011 models uses such a system. The result will be to promote fuel economy without compromising safety.

One consequence of recent federal and state efforts to reduce carbon dioxide may be to require vehicles to meet even more stringent fuel economy requirements. While reducing carbon emissions is an important societal goal, it needs to be accomplished so as to avoid any conflict with the size-indexed fuel economy approach NHTSA has adopted. This can be done if auto manufacturers change, or are required to change, how they use engine technology, which they have been using to increase horsepower. The performance capabilities of new cars have been increasing for 30 years. Between 1985 and 2005, average horsepower climbed 64 percent, from 111 to 183. Research by the Highway Loss Data Institute, an affiliate of IIHS, has shown that increases in vehicle horsepower are associated with higher insurance losses. For example, an addition of just 1 horsepower per 100 pounds of vehicle weight results in losses that are an estimated 5 percent higher under collision coverage per insured vehicle year (a vehicle year is 1 vehicle insured for 1 year, 2 vehicles insured for 6 months each, etc.) By using engine technology to increase fuel economy, rather than to increase horsepower, automakers can offer midsize and larger vehicles that achieve higher fuel economy and also potentially reduce the frequency of crashes.[14]

Bumpers

While NHTSA's primary mission involves public health, the agency has long ignored its mission to reduce the expensive property damage that occurs in low-speed crashes. The agency should require adequate bumpers on all vehicles to reduce such damage, which imposes significant economic costs on consumers. However, the federal bumper requirements that apply to cars do not cover light trucks, vans, and SUVs, which NHTSA collectively refers to as light trucks and vans.

It is legal to sell new light trucks and vans in the US market without any bumpers at all or with ones that are about style instead of damage resistance. This produces several undesirable consequences. In many cases there is virtually no protection of safety-related parts such as headlights and taillights, which often are damaged in low-speed collisions. Owners of light trucks and vans have to pay for expensive repairs to fenders, grilles, and other parts that sustain unnecessary damage in low-speed collisions. And because light truck bumpers are not required to line up with those on cars, they inflict excessive damage to the cars with which they collide at low speeds as well as allow unnecessary damage to the light trucks and vans themselves. NHTSA could, and should, reduce these costs by requiring light trucks and vans to meet the same standards as cars. This would not only reduce costly property damage in low-speed crashes but also enhance occupant safety in more serious crashes by improving vehicle compatibility. NHTSA should grant IIHS's petition, filed in July 2008, to amend the bumper standard to require compliance by light trucks and vans.

A bonus of this policy would be to reduce traffic congestion and fuel costs. The Federal Highway Administration reports that congestion on urban roads is of 2 types, recurring congestion during commuting hours and periodic congestion associated with 1-time events. An estimated 25 percent of nonrecurring congestion results from crashes and other vehicle-related events.[15] Such congestion increases travel time for commuters, shippers, and others on the road. It also wastes fuel as vehicles sit idling or moving at low speeds because of crashes. Requiring better bumpers could prevent or reduce such costs and keep traffic moving.

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Attachment: Federal rulemaking on truck underride guards

1953 Interstate Commerce Commission adopts rule requiring rear underride guards on trucks and trailers but sets no strength requirements.

1967 National Highway Safety Bureau (NHSB), predecessor to the National Highway Traffic Safety Administration (NHTSA), indicates it will develop a standard for truck underride guards.

1969 NHSB indicates it will conduct research on heavy vehicle underride guard configurations to provide data for the preparation of a standard. In the same year the Federal Highway Administration publishes a proposal to require trailers and trucks to have strong rear-end structures extending to within 18 inches of the road surface.

1970 NHSB says it would be “impracticable” for manufacturers to engineer improved underride protectors into new vehicles before 1972. The agency considers an effective date of January 1, 1974 for requiring underride guards with energy-absorbing features as opposed to rigid barriers.

1971 National Transportation Safety Board (NTSB) recommends that NHTSA require energy-absorbing underride and override barriers on trucks, buses, and trailers. Later in the same year NHTSA abandons its underride rulemaking, saying it has “no control over the vehicles after they are sold” and “it can only be assumed that certain operators will remove the underride guard.” The Bureau of Motor Carrier Safety (BMCS), predecessor to the Federal Motor Carrier Safety Administration, considers a regulatory change that would prohibit alteration of manufacturer-installed equipment. This would nullify the major reason NHTSA cited for abandoning the proposed underride standard.

1972 NTSB urges NHTSA to renew the abandoned underride proposal.

1974 US Secretary of Transportation says deaths in cars that underride trucks would have to quadruple before underride protection would be considered cost beneficial.

1977 IIHS testifies before the Consumer Subcommittee of the US Senate Commerce Committee, noting that devices to stop underride have been technologically available for years. IIHS tests demonstrate that a crash at less than 30 mph of a subcompact car into a guard meeting current requirements results in severe underride. IIHS also demonstrates the feasibility of effective underride guards that do not add significant weight to trucks. IIHS petitions NHTSA to initiate rulemaking to establish a rear underride standard. The agency agrees to reassess the need for such a standard and later in the year announces plans to require more effective rear underride protection. BMCS publishes a new but weak proposal regarding underride protection.

1981 NHTSA issues a proposal to require upgraded underride protection.

1986 IIHS study reveals that rear guards designed to prevent cars from underriding trucks appear to be working well on British rigs.

1987 European underride standard is shown to reduce deaths caused by underride crashes.

1996 NHTSA finally issues a new standard, effective 1998.