

Status Report

Insurance Institute for Highway Safety | Highway Loss Data Institute

Tough test for pickups

Ford F-150 nabs lone good rating for small overlap protection

2016 CHEVROLET
SILVERADO
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FOR HIGHWAY SAFETY
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ALSO IN
THIS ISSUE
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- ▶ Automakers compete to adopt autobrake ahead of schedule
- ▶ Speed limit increases cause 33,000 deaths in 20 years



Results for 2016 model large pickups show some aren't as tough as they look when it comes to performance in a small overlap front crash.

Three out of seven large pickup trucks IIHS evaluated in a new round of crash tests earn an acceptable or higher rating for occupant protection in a small overlap front crash.

IIHS evaluated two body styles of each 2016 model-year pickup — crew cab and extended cab. Crew cabs have four full doors and two full rows of seating. Extended cabs have two full front doors, two smaller rear doors and compact second-row seats.

IIHS last year decided it would test the two most popular variants of large pickups instead of just one after discovering that the Ford F-150 extended cab, known as the SuperCab, lacked structural countermeasures that helped the crew cab, known as the SuperCrew, earn the top rating of good in the small overlap test (see *Status Report*, July 30, 2015, at iihs.org). The test replicates what happens when a vehicle runs off the road and hits a tree or pole or clips another vehicle that has crossed the center line.

Ford improved the 2016 model F-150 SuperCab to clinch a good rating in the small overlap crash test, up from the 2015 model's marginal rating. The F-150 is the only large pickup in the latest test group to earn the Institute's top rating in the test. It joins the F-150 SuperCrew in earning a 2016 *TOP SAFETY PICK* award when equipped with Ford's optional basic-rated forward collision warning system.

Vehicles that earn a basic rating for front crash prevention plus good ratings in the small overlap front, moderate overlap front, side, roof strength and head restraint evaluations qualify for *TOP SAFETY PICK*. To qualify for 2016 *TOP SAFETY PICK+*, a vehicle must earn good ratings in the five crashworthiness tests and an advanced or superior rating for front crash prevention.

"Ford is leading the way among large pickup manufacturers when it comes to protecting people in a range of crashes and offering technology to warn drivers of imminent frontal crashes," says Raul



Large pickup ratings in small overlap front test

	Overall	Structure	Restraints & kinematics	Dummy injury measures			
				Head & neck	Chest	Hip & thigh	Lower leg & foot
TSP Ford F-150 SuperCab	G	G	G	G	G	G	G
Chevrolet Silverado 1500 Double Cab	A	A	G	G	G	G	P
Toyota Tundra Double Cab	A	A	G	G	G	G	P
Chevrolet Silverado 1500 Crew Cab	M	M	G	G	G	G	P
Toyota Tundra CrewMax	M	M	G	G	G	G	P
Ram 1500 Quad Cab	M	P	G	G	G	G	P
Ram 1500 Crew Cab	M	P	A	G	G	G	P

Good **G** Acceptable **A** Marginal **M** Poor **P**



There was extensive occupant compartment intrusion in the Ram 1500 (left), resulting in a poor rating for structure. In contrast, survival space was well-maintained in the Ford F-150 (right).

Arbelaez, vice president of the Institute's Vehicle Research Center. "We commend Ford for taking last year's test results to heart and upgrading protection for SuperCab occupants in small overlap crashes."

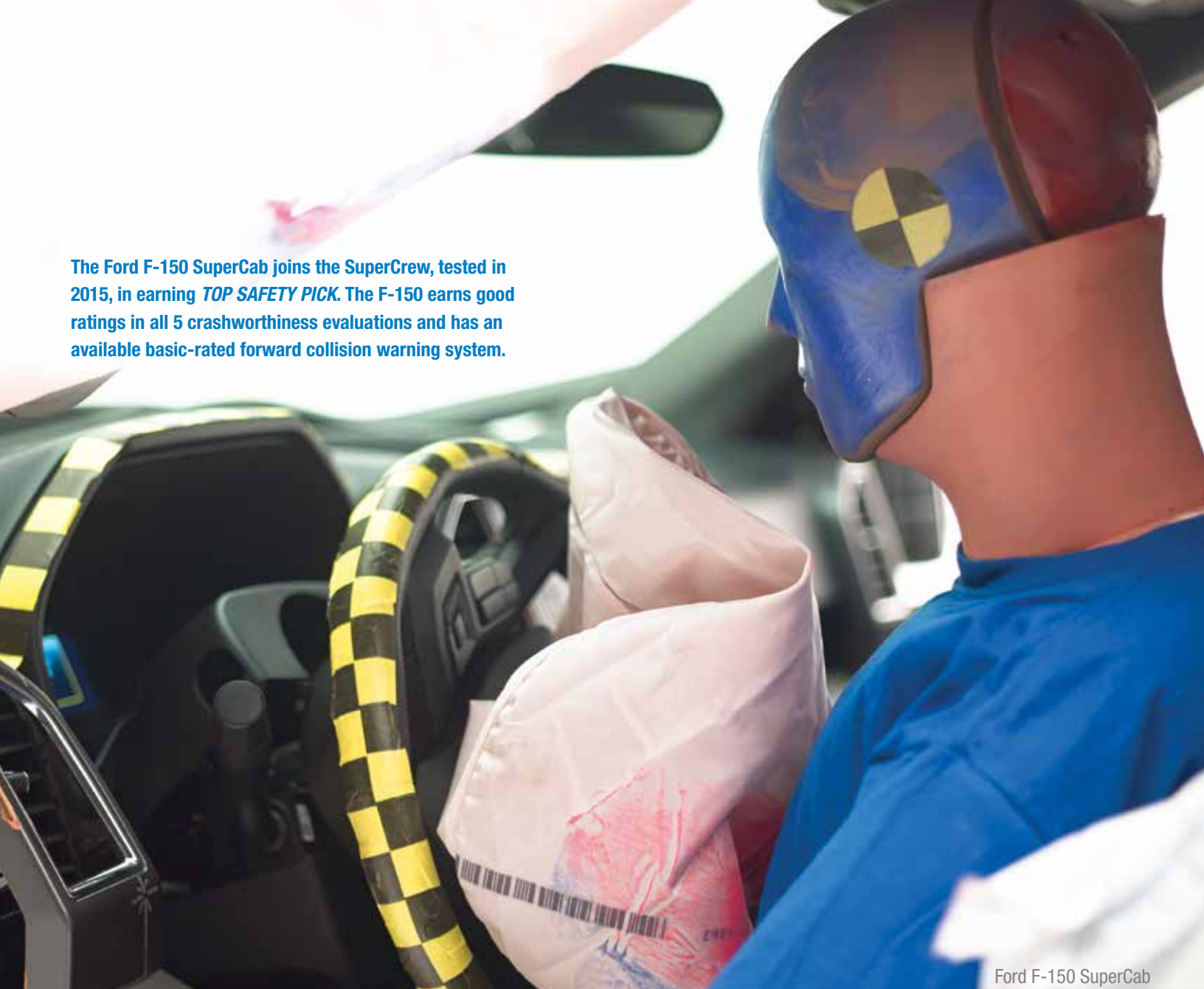
IIHS observed differences in performance between the extended-cab and crew-cab versions of two other pickups. The Chevrolet Silverado 1500 Double Cab and the Toyota Tundra Double Cab both earn an acceptable rating for occupant protection in a small overlap crash. Survival space for the driver in both of these extended-cab pickups was maintained reasonably well overall, contributing to their acceptable ratings for structure.

The story was different for the larger crew cabs. The Silverado 1500 Crew Cab and the Tundra CrewMax earn a marginal rating in the small overlap front test. Both models had considerable intrusion into the occupant compartment that compromised survival space for the driver.

Ratings for both of the Silverado pickups extend to their GMC Sierra 1500 twins.

The worst-performing pickups in the small overlap test are the Ram 1500 Crew Cab and the Ram 1500 Quad Cab. Both earn a marginal rating overall and a poor rating for structure. The force of the crash pushed the door-hinge pillar, instrument panel and steering column back toward the driver dummy. In the Ram Crew Cab test, the dummy's head contacted the front airbag but rolled around the left side as the steering column moved to the right, allowing the head to approach the intruding windshield pillar.

All of the pickups except the F-150 had moderate to severe intrusion into the driver footwell area during the small overlap test. The footrest/left toepan, brake pedal, parking brake and/or lower dashboard were shoved against the dummy's lower legs. In the worst cases (Ram Crew Cab and Ram Quad Cab), maximum intrusion reached



The Ford F-150 SuperCab joins the SuperCrew, tested in 2015, in earning *TOP SAFETY PICK*. The F-150 earns good ratings in all 5 crashworthiness evaluations and has an available basic-rated forward collision warning system.

Ford F-150 SuperCab

16-17 inches. Measures taken from the crash test dummy in all but the F-150 indicated a likelihood of serious lower leg, ankle and foot injuries.

“Drivers in these pickups would need help freeing their legs from the wreckage following a small overlap crash. We encourage manufacturers to redesign their pickups to resist intrusion in the lower occupant compartment to safeguard people from serious leg and foot injuries that might require months of rehabilitation,” Arbelaez says.

Across the board, the large pickups earn good ratings in the moderate overlap front test, side test and head restraint evaluations.

That wasn't the case for roof strength. Four pickups earn good ratings for occupant protection in a rollover crash: the

F-150, both Silverados and Tundra Double Cab. The Tundra CrewMax is rated acceptable, and both of the Ram 1500s are rated marginal. The Institute launched its roof-strength ratings program in 2009.

Keeping the roof from collapsing when a vehicle rolls over is particularly important in pickups because 44 percent of occupant deaths in pickups are in rollovers. Stronger roofs crush less, reducing the risk that people will be injured by contact with the roof itself.

Stronger roofs also can prevent occupants, especially those who aren't using safety belts, from being ejected through windows, windshields or doors that have broken or opened. Pickup truck occupants are the least likely to buckle up among all

vehicle occupants. In 2014, 77 percent of pickup occupants were observed using belts, compared with 89 percent of people in vans and SUVs and 88 percent in cars.

Besides the F-150, the Silverados and their GMC Sierra twins are the only other pickups available with an optional forward collision warning system that earns a basic rating for front crash prevention.

IIHS plans to test the redesigned 2016 Nissan Titan and Honda Ridgeline later this year. The 2015 Titan Crew Cab is rated good in the moderate overlap front test, acceptable for roof strength and good for head restraints. The Ridgeline was last sold as a 2014 model. It earns good ratings in the moderate overlap front, side, roof strength test and head restraint evaluations. ■

Automakers compete to add standard autobrake systems ahead of schedule

A 2022 deadline to voluntarily make automatic emergency braking standard on nearly all new passenger vehicles has automakers vying to get the crash avoidance technology into their models before their competitors.

Toyota says it will equip 25 of 30 Lexus and Toyota models with its suite of crash avoidance features, which includes autobrake, lane departure warning and automatic high beams, by the end of 2017, five years ahead of the deadline. Autobrake comes standard on the 2016 Lexus GS F and LX 570, and Scion iA.

Volvo equips all of its cars and SUVs with its standard City Safety front crash prevention system, and Mercedes-Benz includes standard automatic braking on most of its 2016 models. In addition, the technology is standard on the BMW i8 plug-in hybrid, Infiniti Q50 hybrids and Tesla Model X.

Consumers generally have to pay extra for autobrake when it isn't standard equipment. That can add thousands of dollars to the cost of a new vehicle.

To get the proven crash avoidance technology into the hands of car buyers at all price points, 20 manufacturers have pledged to voluntarily make autobrake standard on nearly all their passenger vehicles by Sept. 1, 2022. The move should speed adoption of autobrake by at least three years compared with the typical course of a regulatory mandate.

The commitment was initially announced in September 2015 at the dedication of the Institute's expanded Vehicle Research Center. At the time, 10 automakers responded to the challenge. Since then, another 10 companies signed on as the Institute, the National Highway Traffic Safety Administration (NHTSA) and manufacturers worked to iron out the details of the commitment and parameters for the technology.

NHTSA and the Institute in March unveiled the timetable for the commitment. Participating automakers include Audi, BMW, Fiat Chrysler, Ford, General Motors, Honda, Hyundai, Jaguar Land Rover, Kia,

Maserati, Mazda, Mercedes-Benz, Mitsubishi Motors, Nissan, Porsche, Subaru, Tesla Motors, Toyota, Volkswagen and Volvo. These companies represent more than 99

A recent IIHS study using U.S. police-reported crash data found that vehicles equipped with front crash prevention are much less likely to rear-end other vehicles



IIHS demonstrates autobrake technology at the U.S. Department of Transportation's Turner-Fairbank Highway Research Center.

Automakers making the commitment:

- | | | | |
|------------------|---------------------|---------------------|----------------|
| ▶ Audi | ▶ Honda | ▶ Mazda | ▶ Subaru |
| ▶ BMW | ▶ Hyundai | ▶ Mercedes-Benz | ▶ Tesla Motors |
| ▶ Fiat Chrysler | ▶ Jaguar Land Rover | ▶ Mitsubishi Motors | ▶ Toyota |
| ▶ Ford | ▶ Kia | ▶ Nissan | ▶ Volkswagen |
| ▶ General Motors | ▶ Maserati | ▶ Porsche | ▶ Volvo |

percent of the U.S. automobile market.

"We're getting these safety systems into vehicles much faster than what would have been otherwise possible," NHTSA Administrator Mark Rosekind notes. "A commitment of this magnitude is unprecedented."

The Institute estimates that shortening the time frame for standard autobrake by three years will prevent 28,000 crashes and 12,000 injuries. Through 2050, the Institute estimates standard autobrake will prevent 230,000 crashes and 102,000 injuries.

"The benefits are far reaching, from injuries and deaths averted to the recovery of productivity that would otherwise be lost in traffic jams caused by the crashes prevented," says David Zubay, the Institute's executive vice president and chief research officer.

(see *Status Report*, Jan. 28, 2016, at iihs.org). Systems with automatic braking reduce rear-end crashes by about 40 percent on average, while forward collision warning alone cuts them by 23 percent, the study found. The autobrake systems also greatly reduce injury crashes.

In lieu of a regulatory mandate, the Institute's front crash prevention ratings have helped speed adoption of the technology. Launched in 2013, the ratings are based on HLDI research indicating that forward collision warning and autobrake systems help drivers avoid front-to-rear crashes (see *Status Report*, July 3, 2012).

Consumers who own autobrake-equipped models also stand to benefit when it comes to insurance premiums. »



Speed limit increases cause 33,000 deaths in 20 years

If Vision Zero is the destination, higher speeds are slowing us down.

A new IIHS study shows that increases in speed limits over two decades have cost 33,000 lives in the U.S. In 2013 alone, the increases resulted in 1,900 additional deaths, essentially canceling out the number of lives saved by frontal airbags that year.

“Although fatality rates fell during the study period, they would have been much lower if not for states’ decisions to raise speed limits,” says Charles Farmer, IIHS vice president for research and statistical services and the author of the study.

Maximum speed limits are set by the

states, and they have been on the rise since 1995. However, during most of the 1970s and 1980s, the threat of financial penalties held state speed limits to 55 mph.

In 1973, Congress required that states adopt 55 mph as their maximum speed limit in order to receive their share of highway funds. Concerns over fuel availability, rather than safety, had prompted Congress to pass the measure, known as the National Maximum Speed Limit, but the most dramatic result was a decrease in fatalities.

In 1987, with energy concerns fading, Congress relaxed the restriction, allowing states to increase speed limits to 65 mph on

rural interstates. The law was completely repealed in 1995.

Proponents of raising the speed limit often argue that such increases simply bring the law in line with reality, since most drivers exceed the limit. Once the limit is raised, however, drivers go even faster.

Not surprisingly, Institute researchers found that travel speeds increased following the repeal of the National Maximum Speed Limit (see *Status Report*, Jan. 31, 2008). They also found that fatalities went up, first on rural interstates with the law’s partial repeal and later on all interstates after the full repeal (see *Status Report*, Jan. 16, 1999).

Automakers committed to a September 2022 deadline to make forward collision warning and autobrake standard on virtually all new passenger vehicles, and insurers are exploring policy discounts.

(« from p. 5) “IIHS member companies strongly support the adoption of effective safety technologies,” says Jack Salzwedel, IIHS board chairman and chief executive of American Family Insurance. “Deploying AEB on a wide scale will allow us to further evaluate the technology’s effectiveness and its impact on insurance losses, so that more insurers can explore offering discounts or

lower premiums to consumers who choose AEB-equipped vehicles.”

Under the commitment, forward collision warning and autobrake will be standard on virtually all light-duty cars and trucks with a gross vehicle weight of 8,500 pounds or less beginning no later than Sept. 1, 2022. The technology will be standard on virtually all trucks with a gross vehicle weight between 8,501 pounds and 10,000 pounds beginning no later than Sept. 1, 2025.

To encourage further development of the technology, NHTSA plans to accelerate its research on more advanced autobrake

applications, including systems that reduce the risk of collisions with pedestrians. In December 2015, NHTSA announced plans to rate autobrake systems and other advanced technologies under its 5-star safety ratings beginning with 2018 models.

“The Institute, too, will continue to look for ways to strengthen autobrake systems,” says Adrian Lund, IIHS president. “We also will look at other features, for example, better headlamps and rear autobrake, that can help reduce the annual toll of more than 30,000 deaths and 2 million-plus injuries from motor vehicle crashes and move us further toward Vision Zero.” ■

The increases have continued apace. Today, six states have 80 mph limits, and drivers in Texas can legally drive 85 mph on some roads.

The new study looked at the effect of all speed limit increases from 1993 to 2013 in 41 states. Nine states and the District of Columbia were excluded because they had relatively few vehicle miles traveled each year, leading to wide fluctuations in their annual fatality rates.

Farmer looked at deaths per billion miles traveled by state and roadway type. Taking into account other factors that affected the fatality rate — including changes in unemployment, the number of potential young drivers (ages 16-24) and per capita alcohol consumption — he found that each 5 mph increase in the maximum speed limit resulted in a 4 percent increase in fatalities. The increase on interstates and freeways, the roads most affected by state maximums, was 8 percent.

Comparing the annual number of fatalities in the 41 states with the number that would have been expected if each state's maximum speed limit had remained unchanged since 1993, Farmer arrived at the estimate of 33,000 additional fatalities over the 20-year period. That number is approximately equal to the nationwide annual tally of fatalities during recent years.

As large a number as it is, 33,000 is likely an underestimate, Farmer says. In his analysis, he considered only increases in the maximum speed limit, which often applies only to rural interstates, but many states also increased speed limits on urban interstates. Other states increased speed limits on one section of road and later extended the higher limit to other sections. Those subsequent changes weren't factored in.

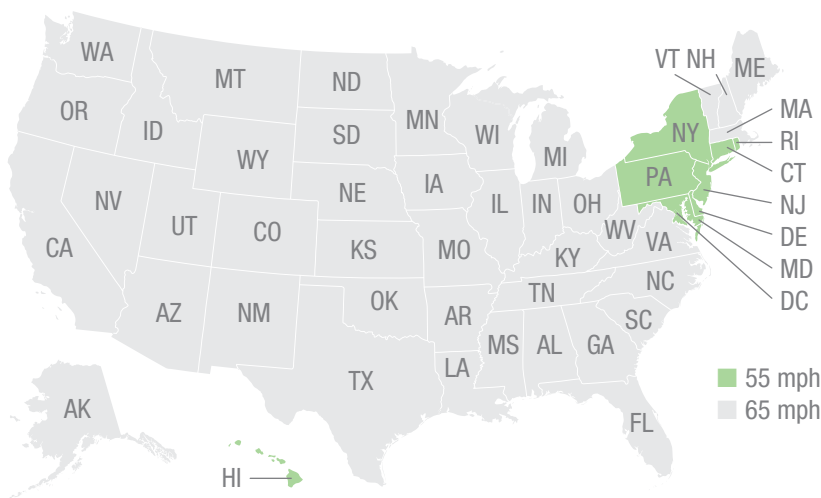
The study doesn't include the increases of the past three years. In 2013, only Texas and Utah had limits above 75 mph. Five more have joined that club since then, and others have abandoned 65 mph limits for 70 mph.

"Since 2013, speeds have only become more extreme, and the trend shows no sign of abating," Farmer notes. "We hope state lawmakers will keep in mind the deadly consequences of higher speeds when they consider raising limits."

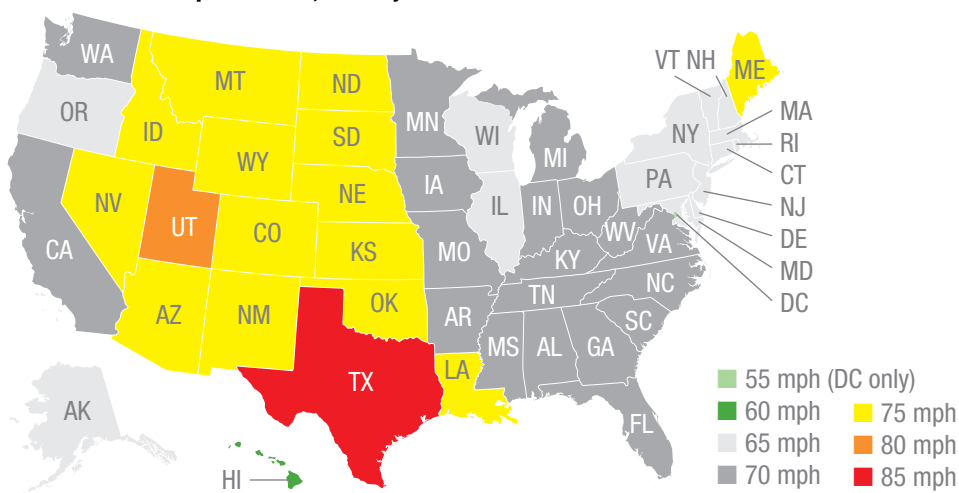
For a copy of "Relationship of traffic fatality rates to maximum state speed limits" by C.M. Farmer, email publications@ihs.org. ■

Rising speed limits and deaths

Maximum speed limits, January 1993

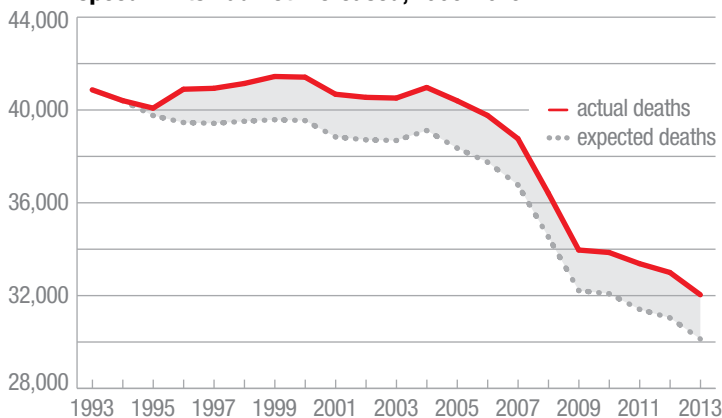


Maximum speed limits, January 2013



Speed limits have gone up further since January 2013. For current information on state maximums, go to ihs.org/speedlimits

Deaths and expected deaths if maximum speed limits had not increased, 1993-2013



If maximum speed limits had stayed at 1993 levels, there would have been 1,900 fewer deaths in 2013 alone and 33,000 fewer over two decades. That tally doesn't include the extreme increases of the past three years.

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IIHS is an independent, nonprofit scientific and educational organization dedicated to reducing the losses — deaths, injuries and property damage — from crashes on the nation's roads.

HLDI shares and supports this mission through scientific studies of insurance data representing the human and economic losses resulting from the ownership and operation of different types of vehicles and by publishing insurance loss results by vehicle make and model.

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