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STATUS REPORT

INSURANCE INSTITUTE
FOR HIGHWAY SAFETY

MINICARS

FIRST CRASH TEST RESULTS

FOR THE FIRST TIME THE INSTITUTE HAS TESTED
THE SMALLEST VEHICLES SOLD IN THE UNITED
STATES, WHICH GAIN POPULARITY AS FUEL



prices rise. Now these cars are rated for comparison of occupant protection in front, side, and rear crashes. The Nissan Versa earns good ratings in all three tests. Two other cars earn good ratings in front and side but not rear tests (see ratings, page 4).

Crash test results indicate which vehicles in each weight category afford the best protection in real-world crashes, and this round of tests reveals big differences among the smallest cars. But results of real crashes show that any car that's very small and light isn't the best choice in terms of safety. Driver death rates in minicars are higher than in any other vehicle category. They're

size SUV weighs 4,000 pounds or more, exceeding the weight of a minicar by at least 60 percent. In every vehicle category (car, SUV, or pickup truck), the risk of crash death is higher in the smaller, lighter models.

"Despite the safety trade-off, more consumers are buying minicars," Lund says. "This is why we tested them. We want consumers to use the ratings to choose the most crashworthy designs among the smallest cars."

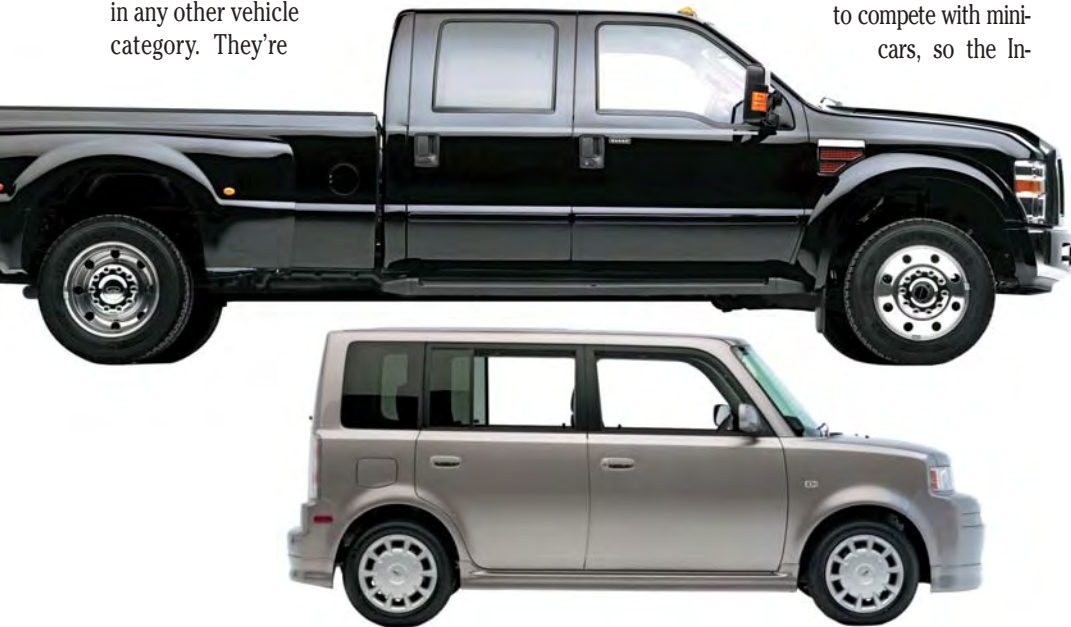
Versa is best: Bigger than the other cars the Institute tested this time around, the Nissan Versa is classified a small car, the next size class up from the minis.

But this car is marketed to compete with minicars, so the In-

The Institute's side test is especially challenging for small cars because the barrier that strikes the test vehicle represents the front end of a pickup truck or SUV. Side airbags designed for head protection are crucial because the barrier crashes into the side of the car right at the level of the heads of the two dummies that are positioned in the driver seat and in the rear seat behind the driver.

"The Versa is bigger than the other cars we tested, so it has size and weight on its side as well as good test results," Lund says.

The Honda Fit with standard side airbags and the Toyota Yaris equipped with optional side airbags also earn good ratings in front and side tests. However, rear protection isn't



Minicars are much smaller and weigh a lot less than big pickup trucks like this Ford — and minicars are light even in relation to other cars. The Scion xB, for example, weighs less than 2,500 pounds. A typical small car weighs about 300 additional pounds, and a midsize car weighs about 800 pounds more than a minicar. One reason people buy minicars is to save fuel. They're expected to go farther on a gallon of gas. But the savings don't always pan out. The xB gets 30 miles per gallon on city streets, the same as the Toyota Corolla, and the Corolla is more fuel economical on the highway. It gets 38 miles per gallon versus 34 for the xB.

HOW SMALL AND LIGHT ARE THEY? HOW ECONOMICAL?

more than double the death rates in midsize and large cars (see facing page).

"People traveling in small, light cars are at a disadvantage, especially when they collide with bigger, heavier vehicles. The laws of physics dictate this," says Institute president Adrian Lund. Death rates in single-vehicle crashes also are higher in smaller vehicles than in bigger ones.

Minicars weigh about 2,500 pounds or less. A typical small car weighs about 300 additional pounds, and midsize cars weigh about 800 pounds more than a minicar. A mid-

stitute is releasing its ratings along with those of competing models.

The Versa is the only car in this round to earn the highest rating of good in all three tests. In the frontal test, its structure held up well, minimizing intrusion into the space around the driver dummy. Most injury measures were low. In the side test, the standard curtain-style airbags prevented contact between the striking barrier and the heads of the crash test dummies (Nissan is modifying the side airbags in cars built after November 2006 to improve protection in side impacts).

rated good. The Yaris is rated marginal for occupant protection in rear impacts, and the Fit's rear rating is poor.

The Institute conducted two frontal tests of the Fit. In the first test the frontal airbag deployed too early, allowing high forces on the driver dummy's head. Honda is modifying the airbags in cars built after November 2006 and says it will recall cars built earlier. In the second test of a Fit with the design change, the frontal airbag deployed properly, and injury measures recorded on the dummy's head were low.

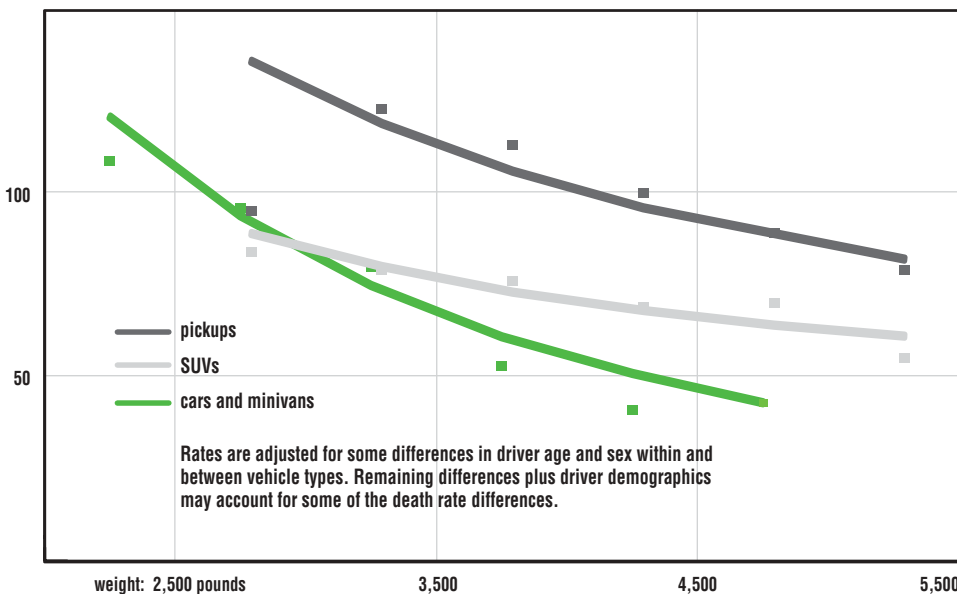


**BEST PERFORMER
AMONG CARS TESTED
THIS TIME AROUND:
NISSAN VERSA**

Only car among eight tested that earns the highest rating of good for front, side, and rear crashworthiness

BIGGER GENERALLY IS SAFER

**DRIVER DEATHS PER MILLION REGISTERED VEHICLES
BY VEHICLE WEIGHT, 2000-04 MODELS DURING 2001-05**



Minicars aren't the best choices in terms of safety because small, light vehicles afford less protection than ones that are larger and heavier. There's less structure to absorb crash energy, so deaths and injuries are more likely to occur in both single- and multiple-vehicle crashes.

This doesn't mean the very heaviest vehicles are the only safe choices because those weighing more than about 4,500 pounds afford only small injury risk reductions. Meanwhile they increase the injury risks for people in the other vehicles with which they collide, especially when the other vehicle is a small, light minicar.

While the risk of death generally is higher in minicars than in bigger vehicles, size and weight don't tell the whole story. Some minicar models are safer than others because some have more crashworthy designs. The Institute's ratings highlight these differences.

Side tests trip up four cars: The Hyundai Accent, Scion xB, and the Toyota Yaris without its optional side airbags earn poor ratings in the side test. The Chevrolet Aveo is marginal. The Accent and Aveo didn't perform well even though they have standard side airbags. The Aveo's front seat-mounted side airbags

did a good job of protecting the driver dummy's head, but this car's structural performance was marginal. Intrusion into the occupant compartment led to high forces on the driver dummy's pelvis. There's no side airbag protection for rear-seat passengers, and the barrier struck the dummy's head.

The Accent's structural performance in the side test also was marginal. Curtain-style airbags in front and rear seats provided good head protection, but measures recorded elsewhere on the driver dummy indicate a motorist in a similar real-world crash would sustain internal organ injuries, broken ribs, and a fractured pelvis.

Overall the Accent is the lowest rated car in this group. The rank order takes into account all three ratings (front, side, and rear).

Another poor performer in the side test is the Scion xB. Side airbags aren't available, and the xB's side structure didn't do a good job of resisting intrusion during the impact. The barrier intruded into the car and struck the driver dummy's head. Measures indicate

the likelihood of brain injuries, serious neck injuries, and a fractured pelvis in a real-world crash of similar severity.

"The Scion's poor side rating and marginal rating in the rear test are especially disappointing because this car is marketed to young drivers, who have the highest crash rates and thus the greatest need for crash-worthy vehicles," Lund says. "Toyota says it

will replace the current xB design later in the 2007 model year, and hopefully the new version will be a better performer."

People often choose to buy very light cars for fuel economy but "you don't have to buy the smallest, lightest car to get one that's easy on fuel consumption," Lund points out. "Models including the Honda Civic, not even the hybrid version, and Toyota Corolla are bigger than the minicars we tested and weigh more, so we would expect better occupant protection in serious crashes. At the same time, these and other small car models get nearly as good fuel economy as minicars."

Rear protection isn't keeping pace: Cars have been earning good ratings in frontal crash tests for several years, and now improvements in side crash protection are accelerating. But the seat/head restraints in many cars still don't provide adequate protection for most people in rear-end crashes. This is the case among the cars the Institute recently tested. Every model except the Versa, classified a small car, earns a low rating of marginal or poor.

"When a vehicle's seat/head restraint design isn't good, people are more likely to suffer neck injuries in rear impacts," Lund points out. This is the most common crash type in commuter traffic. More than 2 million insurance claims are filed for whiplash each year, costing more than \$8 billion. About 1 in 10 of these injuries results in long-term pain and/or disability.

To reduce this burden, seats and head restraints have to work in concert to support people's necks and heads, accelerating them along with the torso as the vehicle is driven forward. The head restraint has to be tall enough and close enough to the back of the head to catch it early in a crash, and the seat has to have some "give" to help keep the head and torso moving together (see *Status Report*, Nov. 20, 2004; on the web at www.iihs.org).

"The seat/head restraint combinations in every car we tested this time around except the Versa wouldn't provide adequate protection against whiplash," Lund says.

Crashworthiness ratings are based on front and side crash tests plus a test simulating a rear impact. For detailed ratings of these minicars and for ratings of other passenger vehicles, go to iihs.org/ratings.



RATINGS

	FRONT	SIDE	REAR
NISSAN VERSA SIDE AIRBAGS STANDARD	G	G	G
TOYOTA YARIS WITH OPTIONAL SIDE AIRBAGS	G	G	M
HONDA FIT SIDE AIRBAGS STANDARD	G	G	P
MINI COOPER SIDE AIRBAGS STANDARD	G	A	M
CHEVROLET AVEO SIDE AIRBAGS STANDARD	A	M	P
SCION xB NO SIDE AIRBAGS	G	P	M
TOYOTA YARIS WITHOUT OPTIONAL SIDE AIRBAGS	G	P	M
HYUNDAI ACCENT KIA RIO SIDE AIRBAGS STANDARD	A	P	P

G	GOOD
A	ACCEPTABLE
M	MARGINAL
P	POOR

GO AHEAD AND REQUIRE ESC, INSTITUTE AND OTHERS TELL REGULATORS

Electronic stability control (ESC) would make its way into all new passenger vehicles under a proposed federal rule that would phase in beginning with 2009 models. The Institute backs the plan but urges faster adoption of this technology, estimating that it could prevent as many as 10,000 fatal crashes each year.

ESC helps drivers control their vehicles during high-speed maneuvers like entering a curve too fast or swerving to avoid a deer on a slippery highway. Even before a driver would know there's a problem, ESC sensors can tell when a vehicle strays from the intended line of travel or begins to spin out. Then ESC automatically brakes individual wheels and sometimes reduces throttle to keep the vehicle under control and moving in the intended direction.

Under the rule proposed by the National Highway Traffic Safety Administration (NHTSA), just 30 percent of 2009 models would have ESC. The technology wouldn't be required on all vehicles until 2012.

"That's too long to wait," says Institute president Adrian Lund, pointing to a Highway Loss Data Institute estimate that more than half of all 2006 models have standard or optional ESC. It will be standard on an estimated 48 percent of all 2007s.

"NHTSA administrator Nicole Nason says ESC is the greatest lifesaving breakthrough since safety belts, and we agree," Lund says. The agency estimates that ESC would save between 5,300 and 10,300 lives each year and prevent 168,000 to 252,000 injuries if it were on all passenger vehicles.

"So why not make sure this technology gets onto cars, trucks, and SUVs as fast as possible?" Lund adds.

Automakers have been voluntarily putting ESC on their vehicles at a steady rate. The percentage with this technology has increased

tenfold since the 1998 model year. This is important because ESC reduces the risk of single-vehicle crashes by about 40 percent. The effect is greater for fatal single-vehicle crashes, which are reduced by more than half. ESC lowers fatal multiple-vehicle crash risk by 32 percent (see *Status Report*, June 13, 2006, and Jan. 3, 2005; on the web at iihs.org).

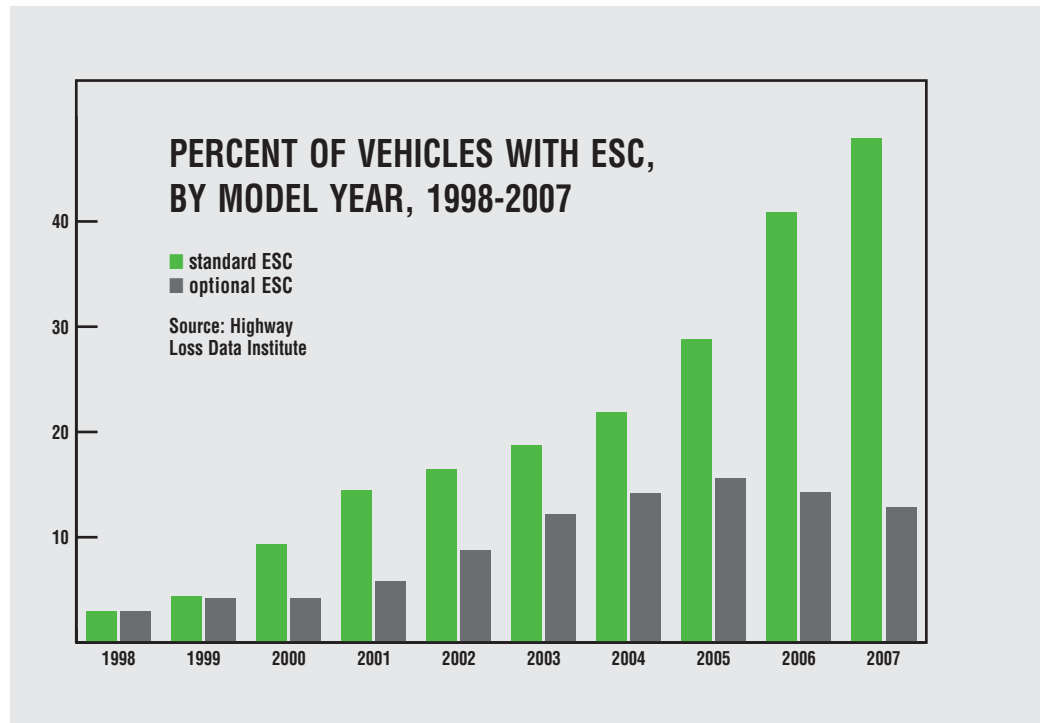
SUVs benefit most because their high centers of gravity make them more likely than cars to roll over. ESC decreases the risk of fatal single-vehicle rollover crashes of SUVs by 80 percent.

Auto manufacturers agree that ESC should be standard safety equipment but tell NHTSA they need longer to phase in the dashboard indicator lights that would be required. The two biggest industry groups, the Alliance of Automobile Manufacturers and Association of International Automobile Manufacturers, say many automakers will have to redesign

Under the proposed rule, switches would be required so drivers could disable ESC in rare situations when it might hinder forward movement — when driving in deep snow, for example. The Institute and automakers support the switch and agree with NHTSA that the system should default to "on" each time a vehicle is started.

Consumers Union recommends 2010 instead of 2012 for 100 percent implementation of ESC and asks NHTSA to require automakers to call their systems ESC instead of the confusing mix of trade names now used to market this technology. Then consumers could more easily identify vehicles with ESC.

"This is the most important vehicle safety technology to come along in a long time," Lund says. "ESC can prevent some serious crashes from ever happening at all. So the sooner we get ESC on every vehicle in the fleet the better."



their dashboards to accommodate the lights indicating when ESC malfunctions or is switched off. These trade groups want to delay the requirements for the indicator lights until the 2012 model year but otherwise favor NHTSA's proposed phase-in schedule for ESC.

Even without the proposed requirement, ESC is proliferating. More than half of all 2006 models have this technology, standard or optional, and ESC will be standard on an estimated 48 percent of 2007s. NHTSA says up to 10,300 lives a year may be saved when every passenger vehicle has ESC.

TEEN DRIVERS' CRASHES SPIKE DURING SCHOOL COMMUTE TIMES

For many teenagers, a big perk of getting a license is to ferry themselves, and maybe their friends, to and from school instead of relying on Mom or Dad or a bus. New Institute research shows that allowing students to chauffeur themselves to school may be riskier than parents and school administrators realize.

"Fatal crashes involving teen drivers' risky practices like speeding, drinking, and late-night driving grab the headlines, while the less severe crashes that occur during school commute times haven't attracted similar attention. Still they're a big part of the teen crash problem," says Anne McCartt, Institute vice president for research and an author of the study.

The researchers collected data on crashes from September 2001 to August 2004 in Fairfax County, Virginia, a Washington, DC, suburb that has the largest public school system in the state. A main finding was a spike in crashes during morning and afternoon school commute times. This is when about 30 percent of the weekday crashes of 16 and 17 year-olds occurred during the school year. Fourteen percent occurred from 6:30 to 7:30 a.m., and 17 percent more occurred between 2 and 3 p.m. Two percent of the crashes occurred from midnight to 6:30 a.m., and 67 percent occurred at other times.

For a snapshot of the characteristics of the school commute crashes, researchers examined police reports of collisions involving 16- and 17-year-old drivers. These collisions were more likely than those at other times to involve multiple vehicles driven by teenagers.

"The students were crashing into each other," McCartt points out.

Crashes during commute times occurred more often near high schools. Thirty

percent occurred within a half-mile of a school, compared with 11 percent of teens' crashes at other times. These crashes also were more likely to involve a teenage girl behind the wheel instead of a boy.

All of the crashes were serious enough to warrant calls to police. However, the majority didn't involve injuries.

Teen drivers were less likely to have been speeding or drinking before crashes during school commute times, compared with late at night. This suggests that risky behavior isn't as much of a factor as at other times.

"The teens in our study weren't necessarily doing anything risky," McCartt notes. "But a lot of teenage drivers do get on the same roads to go to school at the same times of day, so there's high-volume traffic plus novice drivers at the wheel. Morning crashes might be occurring simply because school starts so early and teens may still be tired. Then as they leave school in the afternoon, they might be talking on cellphones or distracted by friends in the car. We can't really point to one particular factor that's causing these crashes."

Discouraging teens from driving to school "is one way to cut down on crashes," McCartt adds. "Buses still are the safest way. At a minimum school officials should work with police to encourage traffic enforcement around schools, including belt use requirements and enforcement of graduated licensing provisions such as teen passenger restrictions."

The researchers didn't find an increase in crashes involving teen drivers during school lunch periods. Fairfax County has a so-called closed policy, which means students can't venture away from school at lunchtime. Such policies have been shown to reduce crashes (see *Status Report*, July 16, 2005; on the web at ihs.org).

For a copy of "Temporal patterns of crashes of 16-17-year-old drivers in Fairfax County, Virginia" by L.A. Hellinga et al. write: Publications, Insurance Institute for Highway Safety, 1005 North Glebe Road, Arlington, VA 22201, or email publications@ihs.org.



FOUR STATES TELL DRIVERS TO HANG UP THE PHONE

OTHER TRAFFIC SAFETY LAW CHANGES ADDRESS BEGINNERS, BELT USE

California recently banned the use of hand-held cellphones by all drivers. Governor Arnold Schwarzenegger signed the legislation that makes California the fifth US jurisdiction to ban hand-held phone use on the road. The others are Connecticut, the District of Columbia, New York, and New Jersey.

The California law goes into effect in July 2008. Offenders will pay a minimum \$20 for a first violation and \$50 for subsequent ones.

North Carolina, Rhode Island, and West Virginia also have enacted cellphone bans. These apply to any kind of phone, not just hand-held, but the laws don't apply to all drivers. West Virginia's applies to drivers with intermediate licenses and learner's permits. The Rhode Island law and North Carolina's prohibit drivers younger than 18 from using any kind of cellphone. Eleven other jurisdictions previously enacted cellphone laws that apply to young drivers.

Institute research indicates that both hand-held and hands-free phones influence driving and increase crash risk. Young motorists are more likely than older people to talk on phones while driving (see *Status Report*, Jan. 28, 2006; on the web at iihs.org).

Legislators beef up young driver laws: People with learner's permits in Kentucky now are required to accumulate 60 hours of practice driving, 10 of them at night, under a law that took effect in October. Another new provision prohibits learners from driving with more than one passenger younger than 20 (there's an exception for family members). In April, a minimum 6-month intermediate licensing phase kicks in that will maintain the passenger restriction along with a driving curfew from midnight to 6 a.m. that's already in place for people younger than 18.

Missouri legislators also have restricted passengers in vehicles driven by teens. During the first six months of licensure, beginners are limited to one passenger younger than 19 who isn't a family member. Then the limit rises to three passengers. Missouri also increased to 40 from 20 the number of hours of supervised driving learners must accumulate. Ten of the hours must be at night.



Four states boost buckle-up provisions: Alaska, Kentucky, and Mississippi have changed their belt laws to allow primary enforcement. This means police may stop motorists solely for not buckling up. Now the laws in 25 US states and the District of Columbia are primary.

North Carolina's law allows for primary enforcement of the provision covering front-seat occupants. A new provision, effective this month, expands the law to cover all back-seat passengers (previously only those 15 and younger had to buckle up). But enforcement of this provision is secondary, meaning police have to stop motorists for some other violation before ticketing for this.

Institute research reveals that driver death rates decline in states that upgrade their laws to allow primary enforcement instead of secondary (see *Status Report*, Jan. 31, 2005; on the web at iihs.org).

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