

Shopping for a Safer Car



This information is provided to you
courtesy of

MetLife® Auto & Home

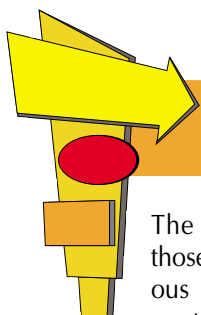


INSURANCE INSTITUTE FOR HIGHWAY SAFETY

Shopping for a Safer Car is published by the Insurance Institute for Highway Safety, a nonprofit research and communications organization wholly supported by automobile insurers. 1005 North Glebe Road, Arlington, VA 22201. 703/247-1500. www.highwaysafety.org.

If you're like most people shopping for a new car, safety ranks high among your purchase considerations. Every new passenger vehicle must meet federal standards specifying minimum safety levels, but this doesn't mean all cars are equally safe. There still are important safety differences.

Identifying the safest car on the road is impossible, but it is possible to shop for a safer car because some vehicle characteristics are inherently safer than others, and many automakers offer safety features beyond the required minimums.



Crashworthiness

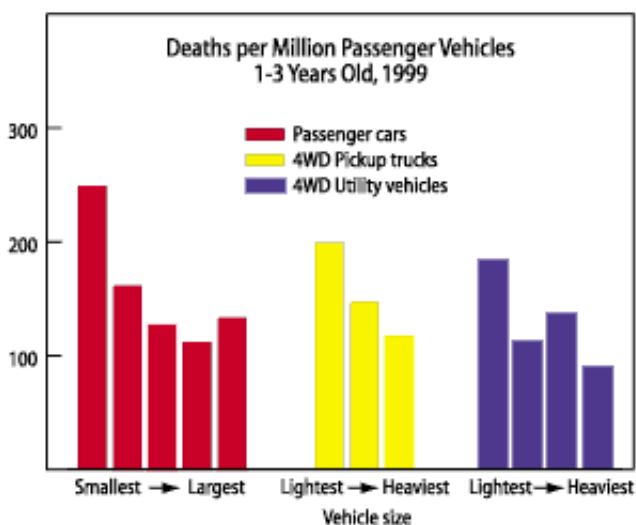
The most important safety features are those that reduce the risk of death or serious injury when a crash occurs. This aspect of vehicle design is referred to as crashworthiness.

Vehicle structural design is the starting point for protecting you in a serious crash. A good structural design should have a strong occupant compartment, or safety cage, and front and rear ends designed to buckle and bend in serious crashes to absorb crash forces. It's important for these crush zones to keep damage away from the safety cage because, once this cage begins to collapse, the likelihood of injury increases rapidly. If it's effectively designed, a longer crush zone lowers both the likelihood of damage to the occupant compartment and the crash forces inside it.

Not all vehicles are equally well designed. Some have crush zones that are too stiff and/or too short and safety cages that aren't strong enough. These can contribute to the collapse of the occupant compartment in serious crashes. Differences in structural design among vehicles in the same weight class can be demonstrated in crash tests conducted by the Institute.

Vehicle size and weight are important characteristics that influence crashworthiness. The laws of physics dictate that, all else being equal, larger and heavier vehicles are safer than smaller and lighter ones. In relation to their numbers on the road, small cars have more than twice as many occupant deaths each year as large cars.

Size and weight are closely related. Large vehicles typically are heavy, and small ones are light. But these two characteristics don't influence crashworthiness the same way. Vehicle size can protect you in both single- and two-vehicle collisions because larger vehicles usually have longer crush zones, which help prevent damage to the safety cage and lower the crash forces inside it.





All else being equal, you're safer traveling in a passenger vehicle that's larger and heavier than in one that's smaller and lighter.

Vehicle weight protects you principally in two-vehicle crashes. In a head-on crash, for example, the heavier vehicle drives the lighter one backwards, which decreases forces inside the heavy vehicle and increases forces in the lighter one. All heavy vehicles, even poorly designed ones, offer this advantage in two-vehicle collisions but may not offer good protection in single-vehicle crashes.

Restraint systems -- belts, airbags, and head restraints -- work together with a vehicle's structure to protect people in serious crashes. Lap/shoulder belts hold you in place, reducing the chance you'll slam into something hard or get ejected from a crashing vehicle. In frontal crashes (by far the most frequent kind), belts permit you to decelerate with the safety cage as the crush zone buckles and bends. If you aren't belted, you'll continue moving forward until something suddenly stops you -- often a hard interior surface that can cause injury.

Some belts are easier and more comfortable to use than others, so test the belts in a car you're thinking of buying. Choose one with belts that fit.

Shoulder belts are on inertia reels that allow upper body movement during normal driving but lock during hard braking or in a crash. Belt webbing is stored on the reel, and during a

frontal crash any slack in the webbing can allow some forward movement of your upper body. Then you could strike the steering wheel, dashboard, or windshield -- a problem addressed in some cars with belt crash tensioners that activate early in a collision to reel in belt slack and prevent some of the forward movement.

But even lap/shoulder belts with crash tensioners cannot always prevent people's heads and chests from hitting steering wheels, dashboards, or windshields in serious frontal crashes. The airbags in all new cars enhance protection by providing additional restraint to the head and



The best available protection is an airbag plus a lap/shoulder belt. The airbag doubles the protection against serious head injury offered by the safety belt alone.

upper body. An airbag doubles the protection against serious head injury offered by a lap/shoulder belt alone.

In some serious crashes, the forces produced by the shoulder belt on the upper body can

cause rib fractures and other injuries. Because airbags provide additional upper body restraint and spread crash forces across the upper body rather than localizing them (as belts do), automakers can modify shoulder belt designs to limit the forces exerted by the belt on the upper body. More new cars offer shoulder belts with force limiting designs.

Airbags and lap/shoulder belts together are very effective, but there are circumstances when inflating airbags have caused serious injuries, even deaths. The risk occurs if you're on top of, or very close to, an airbag when it first begins to inflate.

Using belts correctly and choosing a proper seating position can eliminate serious airbag injury risk without sacrificing the benefits. Drivers should always use belts and sit with the center of the chest at least 10 inches away from the steering wheel. Belted drivers potentially at risk of serious airbag injury are the few sitting very close to the wheel.

Choose a vehicle that allows you to reach the pedals comfortably without sitting too close to the steering wheel. Some cars offer telescoping steering column adjustments that may help.

Airbag injury risk is lower in 1998 and later models because automakers have redesigned most of their airbags using less powerful inflators. Some automakers also have reduced inflation injury risk with dual deployment thresholds. Most airbag deaths and serious injuries have occurred in crashes at speeds close to the threshold at which airbags deploy -- crashes in which the bags provide relatively little additional protection to belted occupants. More new cars soon will have airbags with deployment thresholds that are higher when safety belts are used. Plus inflation forces will vary according to crash severity.

What about children riding in airbag cars?

Never put a rear-facing restraint in the front seat because this puts an infant's head too close to the passenger airbag. Babies, toddlers, and older kids should ride in back, properly restrained. It's



DON'T put a rear-facing infant restraint in the front seat with a passenger airbag.

safer in back, with or without airbags, but if a child must ride up front, set the seat all the way back. Don't let the child lean forward to fiddle with radio dials, for example, because this can put the head too close to the airbag.

Infants should ride in rear-facing restraints secured by adult safety belts in the back seats of vehicles. When infants outgrow these restraints, they should travel in special child seats that, again, are held in place by adult safety belts in the back seat. These restraints, like the ones for infants, offer good crash protection, but they're sometimes difficult to install and use correctly. A number of passenger vehicles offer built-in child restraints that eliminate the installation difficulties.

While both child seats and adult safety belts are very effective in crashes in which the safety cage remains undamaged, these restraints offer less protection if there's intrusion into the safety cage. Serious side impacts are more likely than frontal crashes to involve intrusion, and many of the serious injuries in side impacts occur when crash forces drive doors into occupants. Automakers use padding to reduce the forces reaching occupants, and some automakers are adding side airbags for increased energy absorption and cushioning.

Side airbags designed principally to protect people's chests are available in some vehicles. Side airbags for your chest also may keep your head from hitting interior or intruding structures, but the head can be particularly vulnerable in more serious side impacts. To address this, side airbags with head protection are now becoming available.

Head restraints are required in the front seats of all new passenger vehicles to keep your head from being snapped back, injuring your neck in a rear-end crash. But all head restraints aren't the same. Some are adjustable while others are fixed. Head restraints also vary in height and how far they're set back from the head. To pre-



BMW 5- and 7-series cars include an innovative Head Protection System (above). Look what happens without this system (below) in a 20 mph side impact into a pole.

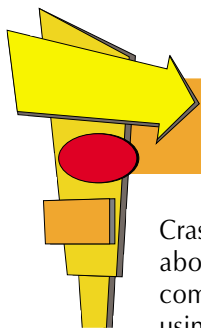




Some head restraints are better than others. To prevent neck injury, a restraint has to be positioned directly behind and close to the back of your head, like the fixed restraint shown above. If a head restraint is positioned too low and too far behind the head (below), it won't do you any good.



vent neck injury, a head restraint has to be directly behind and close to the back of your head. Make sure the ones in a car you're considering for purchase can be positioned this way. And if the restraints are adjustable, make sure they lock when adjusted. Some don't, which means they could be pushed down in a crash.



Crash Testing

Crash tests provide important information about crashworthiness you can use to compare passenger vehicles. But when using information from crash tests, it's important to remember that such comparisons aren't valid among vehicles in different weight classes.

Frontal crash test information is available from two main sources. One is the U.S. Department of Transportation, which has been conducting head-on tests since 1978. The whole front end of each vehicle hits a rigid barrier at 35 mph, providing a good indication of restraint performance in serious frontal crashes. In large part because of this long established testing program, most new passenger vehicles have good restraint systems.

Since 1995, the Insurance Institute for Highway Safety has been conducting 40 mph crash tests in which only part of a vehicle's front end hits a deformable barrier simulating the front of another vehicle. This frontal offset test provides a good indication of a vehicle's structural performance in serious crashes. In particular, it indicates how well the vehicle's safety cage and crush zones manage the energy of a crash and keep crash forces away from the occupant compartment.

Full-front (as conducted by the federal government) and frontal offset tests complement each other, and, ideally, a vehicle should perform well in both. Federal test results are available from the U.S. Department of Transportation.

Crashworthiness Evaluations

G Good

A Average

M Marginal

P Poor

✓ Best Pick
in class

Midsize 4-Door Cars

- ✓ **G** **Ford Taurus/Mercury Sable**
2000-01 models
- ✓ **G** **Chevrolet Lumina**
1995-01 models
- ✓ **G** **Toyota Camry**
1997-01 models
- ✓ **G** **Volvo S80**
2001 models
- ✓ **G** **Subaru Legacy**
2000-01 models
- ✓ **G** **Buick LeSabre/Pontiac Bonneville**
2000-01 models
- ✓ **G** **Toyota Avalon**
2000-01 models
- ✓ **G** **Volkswagen Passat**
1998-01 models
- A** **Honda Accord**
1998-01 models
- A** **Mazda Millenia**
1995-01 models
- A** **Saab 9-3**
1999-01 models
- A** **Hyundai Sonata**
1999-01 models
- A** **Mitsubishi Galant**
1999-01 models
- A** **Nissan Maxima**
2000-01 models
- A** **Infiniti I30**
2000-01 models
- P** **Ford Contour/Mercury Mystique**
1995-00 models
- P** **Chevrolet Cavalier/Pontiac Sunfire**
1995-01 models
- P** **Chrysler Cirrus/Dodge Stratus**
1995-00 models

Small 4-Door Cars

- ✓ **G** **Volkswagen Jetta/Golf**
1999-01 models
- A** **Honda Civic**
1996-00 models
- A** **Toyota Corolla/Chevrolet Prizm**
1998-01 models
- A** **Ford Escort**
1997-01 models
- A** **Hyundai Elantra**
1996-00 models
- A** **Saturn SL**
1995-01 models
- A** **Mazda Protege**
1999-01 models
- A** **Nissan Sentra**
2000-01 models
- P** **Mitsubishi Mirage**
1997-01 models
- P** **Dodge/Plymouth Neon**
2000-01 models
- P** **Kia Sephia**
1998-01 models

Midsize Utility Vehicles

- ✓ **G** **Toyota 4Runner**
1998-01 models
- ✓ **G** **BMW X5**
2001 models
- ✓ **G** **Mercedes M**
1999-01 models
- A** **Land Rover Discovery**
1999-01 models
- A** **Mitsubishi Montero**
2001 models
- A** **Ford Explorer**
1995-01 models
- M** **Jeep Grand Cherokee**
1999-01 models
- M** **Nissan Pathfinder**
Infiniti QX4
1997-01 models
- P** **Isuzu Rodeo/Honda Passport**
2000-01 models
- P** **Chevrolet Blazer/GMC Jimmy**
1995-01 models

Large Luxury Cars

- ✓ **G** **BMW 5 Series**
1997-01 models
- ✓ **G** **Lexus LS 400**
1995-00 models
- ✓ **G** **Cadillac Seville**
2000-01 models
- A** **Mercedes E Class**
1997-00 models
- A** **Lincoln Continental**
1995-01 models
- M** **Infiniti Q45**
1997-01 models



Passenger Vans

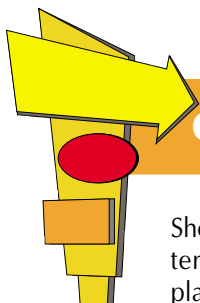
- ✓ **G** **Toyota Sienna**
1998-01 models
- ✓ **G** **Ford Windstar**
1999-01 models
- A** **Mazda MPV**
2000-01 models
- M** **Dodge Grand Caravan**
Chrysler Town & Country
Plymouth Grand Voyager
1996-00 models
- M** **Honda Odyssey**
1995-98 models
- M** **Nissan Quest**
Mercury Villager
1999-01 models
- P** **Chevrolet Astro**
GMC Safari
1996-01 models
- P** **Ford Aerostar**
1992-97 models
- P** **Toyota Previa**
1994-97 models
- P** **Pontiac Trans Sport**
Oldsmobile Silhouette
Chevrolet Venture
1997-01 models





The crashworthiness evaluations listed on the preceding pages are based primarily on performance in a 40 mph frontal offset crash test. This test provides a good indication of the performance of vehicle crush zones and safety cages.





Crash Avoidance

Shopping for a vehicle with features intended to prevent crashes in the first place may seem as important as looking for vehicle features to protect you when

a crash occurs. Basic crash avoidance features like brakes, lights, and turn signals are essential, but few of the more advanced features promoted for crash avoidance have demonstrated they reduce crashes.

Automakers may tout features like traction control and four-wheel-drive to avoid crashes, and these may indeed improve performance on certain road conditions. But they have more to do with enhanced performance, faster starts, and cornering than with safety. There's no evidence they prevent crashes.

Antilock brakes now are widely available features. When a driver brakes hard with conventional brakes, the wheels may lock and cause skidding, loss of control, and long stopping distances on wet or slippery roads. Antilocks pump brakes automatically, many times a second, to prevent lockup and enable a driver to maintain steering control. This also can mean substantially shorter stopping distances on wet and slippery roads but not on dry road.

Despite impressive test track performance, the on-the-road safety benefits of car antilocks are disappointing. They haven't cut the frequency or cost of crashes resulting in insurance claims for vehicle damage. Studies by the government, Insurance Institute for Highway Safety, and automakers find that cars with antilocks are in more single-vehicle crashes than cars with conventional brakes. It's not clear why this is so, but many drivers don't know how to use antilocks.



The impressive test track performance of antilock brakes hasn't translated into fewer crashes on the road. So remember that antilocks are a plus, but they won't let you stop sooner in all circumstances.

If you were trained to brake gently on slippery roads or pump your brakes to avoid a skid, you now have to "unlearn" old habits and use hard, continuous brake pressure to activate the antilock feature.

If you anticipate driving a lot on slick roads, antilocks might be worthwhile. Remember they're more about steering control than about stopping on a dime.

Daytime running lights, activated by the ignition switch, typically are high-beam headlights at reduced intensity or low-beam headlights at full or reduced power. By increasing the contrast between vehicles and their backgrounds, making the vehicles more visible to oncoming drivers, these lights can prevent some other vehicles from running into you during the day.



On-the-Road Experience

Other vehicle design characteristics influence injury risk on the road. For example, some small utility vehicles and pickups are prone to rolling over. High-performance vehicles typically have higher-than-average death rates, largely because many of their drivers use the excessive performance capability and get in more than their share of serious single-vehicle crashes.

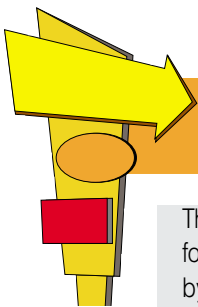
Some vehicle/driver combinations are especially dangerous. This includes, for example, young drivers behind the wheels of high performance or small utility vehicles.

The on-the-road crash experience of passenger vehicles can be used to identify some of these problems. Car-by-car summaries of death rates and insurance loss results for hundreds of recent models are available.



If a teenager in your family is learning to drive or getting ready to get a license, you may be interested in publications that summarize the on-the-road death rates and insurance injury losses of hundreds of popular passenger vehicle models. This information can help you choose an appropriate vehicle for a beginning driver.

Also available is a brochure about teenage driving that discusses the serious problem of crash deaths and injuries involving young beginners and outlines some practical ways to reduce the risks for teenagers while they learn to drive, gain some experience behind the wheel and, just as important, become a little more mature.



More Information

This publication gets you started shopping for passenger vehicles with safety in mind by identifying the aspects of vehicle

design that determine safety, identifying important safety features, and summarizing crash test information. More detailed information is available from the Insurance Institute for Highway Safety and the affiliated Highway Loss Data Institute. The best way to get it is on the Internet : www.highwaysafety.org. Here's some of what you'll find:

Detailed crashworthiness evaluations based primarily on performance in a frontal offset crash test conducted at 40 mph into a deformable barrier
Death rates for popular passenger vehicles
Insurance injury, collision, and theft losses for popular passenger vehicles

"About Your Airbags" explains the lifesaving benefits of these restraints and the rare cases in which occupants may be at risk of airbag inflation injury
"Get an Airbag On/Off Switch?" points to the few circumstances when motorists should consider getting on/off switches for their airbags

"Kids and Airbags" tells how to transport children in airbag cars without injury risk if the bags inflate
"Beginning Drivers: Helping Them Make It Home" addresses risks associated with teenage driving and points out ways to protect young beginners

These publications also are available from the Institute at 703/247-1500. Or write to 1005 North Glebe Road, Arlington, VA 22201.

Another source of motor vehicle safety information, including the results of full-front crash tests, is the U.S. Department of Transportation. For these results, call 800/424-9393 or visit

www.nhtsa.dot.gov.

**INSURANCE INSTITUTE
FOR HIGHWAY SAFETY**

Being in the insurance business means much more to us than just selling you an auto or home insurance policy. It means providing you with the vital resources you need to help you keep yourself and your family safe and sound. We're proud to make a whole library of consumer and safety information available to you.

Just call 1-800-MetLife today and order whichever brochures you would like using the reference numbers at the right.

Title	Reference Number
Guide to Insurance	N12
Be a Smart Shopper	
Buying a Boat	401
Buying a Car	402
Buying a Home	403
Home Improvement	404
Renting an Apartment	405
Selling a Home	406
Auto Insurance	801
Disability Insurance	802
Homeowners Insurance	804
More Money in Your Pocket	
Payment Options	N01
Insurance Costs - What Drives Them?	N02
Auto Discount Brochure	N03
Home Discount Brochure	N04
Playing it Safe	
ABS Brakes- What do you know about anti-lock brakes?	N05
Kids and Airbags	N06
About Your Airbags	N18
Injury, Collision and Theft Losses by Make/Model	N08
Beginning Drivers: Helping Them Make it Home	N09
Teaching Your Teen to Drive (Without Driving Each Other Crazy!)	N10
Young Drivers: The High Risk Years (Video)	N14
Boating Safety	N11
About... Keeping Your Home Safe	506
Weathering the Storm	
Preparing for Earthquakes	701
Preparing for Floods	702
Preparing for Hurricanes	703
Preparing for Tornadoes	704
High Boltage!	N19
Up in Smoke!	N20
Rising Waters!	N21
Water, Water Everywhere!	N22
How to File a Claim (Video)	N15

MetLife® Auto & Home

MetLife Auto & Home is a brand of
Metropolitan Property and Casualty Insurance Company and its Affiliates, Warwick, RI