

STATUS REPORT

INSURANCE INSTITUTE
FOR HIGHWAY SAFETY

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Redesigned Volkswagen, Toyota models ace offset tests they once flunked

Same automakers.
Different model years.
Big performance differences.

The 1996 Previa flunked the Institute's 40 mph offset frontal crash test, but Toyota has returned in 1998 with the all-new Sienna, a minivan earning the distinction of being the best passenger van the Institute has tested.

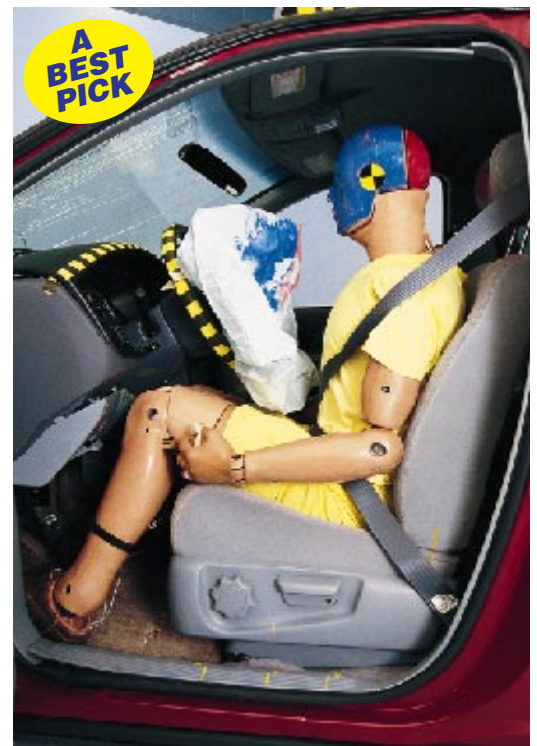
Volkswagen's 1995 Passat earned a poor overall rating in a previous Institute offset test, too, but the newly redesigned 1998 Passat received a good overall rating in the Institute's latest series of crash tests. It's among the best of the midsize cars the Institute has ever tested.

"Automakers obviously are paying attention to our crash test results," says Brian O'Neill, Institute president, "and are improving performance in offsets when they re-design their vehicles."

Says Tony Fouladpour of Volkswagen, "We're obviously very happy with the results." The 1998 Passat's



Crashworthiness



Dummy movement in the frontal offset test of the 1995 Passat (top left) wasn't well controlled so the dummy's head finished between the roof rail and the door frame. This problem has been fixed in the 1998 model (top right). There was significant occupant compartment intrusion in the test of the 1996 Previa (bottom left), the Sienna's predecessor. Too much belt slack allowed the dummy to submarine under the belt. The 1998 Sienna (bottom right) held up well — especially the driver space — in the offset test.

good performance in the frontal offset test is “something we are proud of. That kind of offset crash was important to the design of the vehicle.” He adds that Volkswagen has worked hard to improve the crash performance of the Passat, and “we will continue to work very hard on it.”

Robert J. Wade, Toyota spokesman, says the company is pleased the Sienna performed well in

the Institute offset test. “Toyota engages in comprehensive crashworthiness testing of all our models ... involving impacts at various angles and speeds. We also are very interested in the results of IIHS and other third-party tests of our products.”

Toyota and Volkswagen aren't the only manufacturers who have improved the crashworthiness of their vehicle line. “Other manufacturers are do-

ing the same thing," O'Neill says, "and we expect the improvements to continue as more and more vehicles are redesigned for future model years."

Three other redesigned 1998 cars also were evaluated by the Institute. The Nissan Maxima improved to acceptable for 1998, compared with a rating of poor for the 1995 model. The Toyota Avalon improved from marginal in 1996 to acceptable in 1998. The 1995 Honda Accord was already rated acceptable and kept this rating for the 1998 model year.

Redesigned Sienna and Passat: These two models "are totally new designs for 1998, so we hoped to see big improvements in crashworthiness, and we got them," O'Neill points out. "In particular, the Sienna is on a par with the 1997 BMW 540i, previously the vehicle with the least amount of intrusion into the driver space among the 50-plus vehicles that we've tested so far."

O'Neill adds that the Sienna earned the highest rating of five stars for both driver and passenger in the federal government's 35 mph New Car Assessment Program crash test. "So this vehicle demonstrates what can be achieved by a manufacturer who's committed to improving crashworthiness performance," he says.

In government tests, the 1998 Toyota Avalon earned four stars for the driver and five for the passenger, while the Honda Accord and Nissan Maxima earned four stars for both driver and passenger. The 1998 Passat hasn't been tested.

The stellar performance of the Sienna and Passat in the Institute tests are largely the result of improved structures.

"The Sienna's safety cage held up so well in the 40 mph offset test that intrusion into the driver space was as little as we've seen in any of our crash tests so far," O'Neill explains. An offset test of the Sienna's predecessor model, the 1996 Toyota Previa, resulted in far more intrusion into the driver space plus too much vertical movement of the steering column. Both problems were fixed in the Sienna.

The Passat improved a lot, too. The structural performance of a 1995 Passat in the Institute's offset test revealed moderate intrusion into the occupant compartment but extensive buckling of the floor under and behind the driver seat. Both of these problems have been substantially improved in the redesigned 1998 Passat.

Automakers review test results: The Institute evaluates passenger vehicles at its Vehicle Research Center in Ruckersville, Virginia. Automaker representatives usually attend tests and are invited to inspect both their own and competitors' cars afterward. Following testing of the 1996 model Previa, Toyota representatives evaluated the Previa and other vehicles tested. Likewise, Volkswagen engineers inspected the 1995 model Passat after Institute tests.

"We've had lots of interaction with engineers from the car companies both before and after our tests," says David Zuby, Institute vice president. "They've called

with questions, and we've invited them here to see the cars recently tested." Some of the visiting engineers measure and photograph the cars as part of their inspections. Automakers also receive copies of detailed technical reports of the crash tests.

Crashworthiness evaluations: These are based primarily on performance in a frontal offset crash test, which involves 40 percent of a vehicle's front end hitting a deformable barrier at 40 mph. Institute researchers use these tests to evaluate three important aspects of vehicle crashworthiness — how well the front-end crush zone manages crash energy and the safety cage limits occupant compartment intrusion, injury risk measured on a dummy representing an average-size male driver, and how well dummy movement is controlled during impact.

All vehicles are rated in the three categories and then assigned overall evaluations of good, acceptable, marginal, or poor. Head restraint design and bumper performance in low-speed crash tests don't affect overall evaluations but are considered when establishing vehicle rankings within each rating group.


The frontal offset test is a demanding test of a vehicle's structural performance — how well the front-end crush zone absorbs the crash energy and minimizes damage to the occupant compartment (or safety cage). This aspect of performance is assessed on the basis of measured intrusion into the area where the driver sits.



Structural performance in 40 mph offset test

measured intrusion (cm) of redesigned 1998 models compared with earlier models

	Brake Pedal	Foot Rest	Left	Toepan Center	Right	Dashboad Left	Right
1998 TOYOTA SIENNA	8	4	10	6	6	2	3
1996 TOYOTA PREVIA	27	22	25	26	29	8	12
1998 VOLKSWAGEN PASSAT	4	12	16	13	10	8	7
1995 VOLKSWAGEN PASSAT	23	25	36	25	20	8	6



Carolina belt use peaks at 84 percent; future gains sought

After raising its driver belt use rate to among the best in the nation and reducing the ranks of its alcohol-impaired drivers, what will North Carolina do for an encore?

More of the same. The tandem approach of enforcement and publicity that proved so successful during a five-year highway safety initiative is slated to continue.

"Click It or Ticket," launched in early 1993, boosted belt use rates from 64 to 84 percent. The number of drivers with illegal blood alcohol concentrations, measured at sobriety checkpoints after "Booze It & Lose It," fell by more than half. Additional rounds of these programs, which feature well-publicized checkpoints, are slated to begin this spring and continue throughout the year.

"We fully expect North Carolina to build on its past success," says Institute President Brian O'Neill. "An effective highway safety program must be ongoing, and North Carolina has demonstrated its willingness to stay with the program and do even better."

The five-year initiative: Behind the numbers in North Carolina are scores of government officials, state troopers, local police, county health officials, and others who mobilized in 1993 to reduce deaths and injuries from motor vehicle crashes. (See *Status Report*, Vol. 28, No. 14, Dec. 20, 1993 and Vol. 32, No. 2, Feb. 15, 1997).

Enforcement of belt, child restraint, and DWI laws was vigorous and well publicized. "The point was to magnify police enforcement with highly visible checkpoints and publicity so people understood they really might get a ticket if they violated the law," O'Neill explains. Research worldwide demonstrates the need for both enforcement and publicity to change behavior in regard to traffic laws.

Public-private partnership: The first five years of the North Carolina initiative were the result of a public-private partnership. North Carolina Governor Jim Hunt's personal commitment to highway safety laid the foundation for the initiative. North Carolina Insurance Commissioner Jim Long was a prominent participant, crisscrossing the state to raise awareness. The Governor's Highway Safety Program, headed by Joe M. Parker, coordinated the program together with

CLICK IT
OR TICKET.
(Because It's Buckle Up Or Pay Up)

BOOZE IT & LOSE IT.

the Department of Insurance. Auto insurers committed \$3.5 million, supplemented by state and local funds, and the National Highway Traffic Safety Administration provided federal money earmarked for local use. The Institute supplied program direction and research design and assisted the University of North Carolina Highway Safety Research Center in program evaluation.

Dubbed a “best practice” by the U.S. Department of Transportation, this partnership can be duplicated elsewhere. President Clinton has asked states to help boost safety belt use from 68 to 85 percent nationwide by 2000, and the federal plan includes elements that worked in North Carolina. The President also is asking states to enact primary belt laws like North Carolina’s that allow officers to ticket for failure to use belts alone instead of only in conjunction with other violations.

How it’s done: Highly publicized three-week enforcement efforts were implemented throughout the five-year period. Surveys before and after “Click It or Ticket” documented shifts in belt use.

In the initiative’s second year, motorists were reminded that driving while impaired by alcohol in North Carolina is punished by loss of license on the spot under “Booze It & Lose It.”

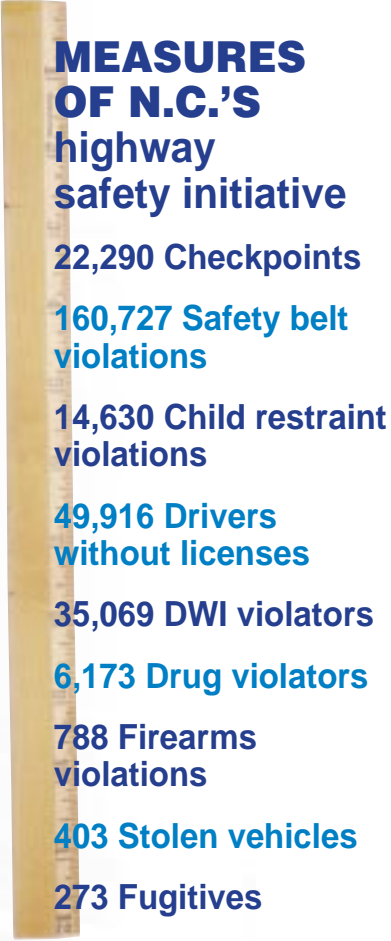
Data gathered before the first enforcement effort showed that 2.4 percent of drivers had blood alcohol concentrations (BACs) at or above North Carolina’s per se limit of 0.08 percent. In the “Booze It & Lose It” special enforcement areas, the percentage of drivers with BACs at or above 0.08 percent passing through state checkpoints went from 2.0 percent before the program to 0.9 percent after it.

“There will never be enough police to detect every violator of traffic laws. But once drivers think there’s a good chance violators will be detected, the number of offenders decreases,” says Institute senior vice president Allan F. Williams.

This is the rationale of the enforcement and publicity model that has succeeded in U.S. cities such as Elmira, New York, and in Australia, Canada, the Nether-

lands, and New Zealand. Now, for the first time, it has been systematically and successfully applied over a five-year period across an entire U.S. state.

Checkpoints, regular patrols: More than 22,000 highly visible and publicized checkpoints for both belt use and impaired driving were cornerstones of the initiative. Roving patrols also were used.



Although checkpoints provide the opportunity to ticket offenders, the ultimate goal is deterrence — no violators and, therefore, no tickets at all. Police coordination ensured the checkpoints were conducted with minimal inconvenience to motorists, and public response, measured by polling data, was overwhelmingly positive.

“At first there was some hostility toward the checkpoints, but that animosity

lessened as the populace was educated,” says Sgt. Ken Whitesell of the Guilford County Sheriff’s Office. “The feedback changed to where some would even thank the officer, or acknowledge that they were sorry, they knew they should be wearing a belt, as opposed to the early days when the response was ‘I’m not hurting anyone, and you have no right to stop me.’”

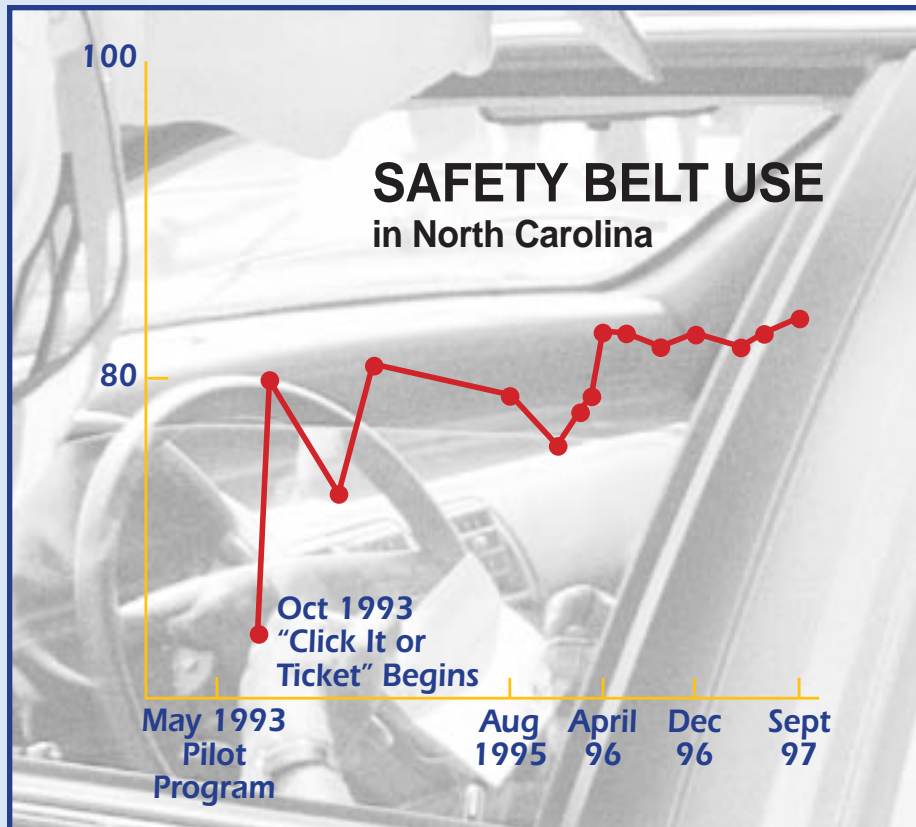
Coordination counts: Another key to success was unprecedented coordination among North Carolina’s 400 state and local law enforcement agencies. The police, in turn, were aided by health department workers, fire and rescue squads, and others in the public health sector.

“The program gives local police and the highway patrol a chance to work together in a nonemergency situation,” says Capt. John Ennis of the Greenville Police. “We also worked with the county injury prevention program, which helped with child restraint clinics and trained officers to spot improperly installed child seats.”

Child restraint clinics sponsored by county hospitals and health departments were conducted with “Click It or Ticket” checkpoints statewide. Instead of being ticketed, first-time violators of the child restraint law were referred to the clinics.

“It was great to have the different disciplines working together. It really enhanced our sense of community,” says Jessica Gurganus, a community health educator at Pitt County Memorial Hospital. “I’d never worked with law enforcement and had some stereotypes, but it was a pleasant experience. The police can be a big help in injury prevention, because they see what goes on out on the road. They can help us educate parents about car seats.”

Child restraint use was always a key part of the message. A pilot study at elementary schools and daycare centers involved letters to parents notifying them of the checkpoints and urging proper restraint use. Usage went from 36 to 64 percent at one pilot school and 49 to 71 percent at the other. Rates also rose at the daycare center, though not as much. *(cont’d on p. 6)*



Red light cameras deter red light running, win approval in California

Red light running violations dropped about 42 percent in Oxnard, California, several months after red light cameras were introduced at intersections there in 1997, indicates a new Institute study.

Plus the public overwhelmingly favored using the special enforcement cameras. The Institute surveyed residents of Oxnard and found that nearly 80 percent said they supported the cameras.

Researchers noted that the cameras have a spillover effect at city intersections that weren't equipped with them. Red light running fell substantially at these intersections, too, and they are included in the measurement of the overall decline in red light running violations in Oxnard.

"Knowing cameras are being used in the community encourages drivers to stop for red lights whether or not an intersection is equipped with a camera," says Richard Retting, Institute senior traffic engineer. "Their use appears to promote a general readiness among motorists to stop for red lights. This effect may have been more pronounced in Oxnard because a relatively large number of intersections had cameras." During the study, nine Oxnard intersections were equipped with them.

Public support for the cameras was high before the program began and strengthened six weeks after the cameras started being used. Six months into the program, support remained high. Ten to 15 percent of respondents, however, strongly opposed camera use. Support was generally lower among males and among respondents ages 16-29.

A separate national public opinion survey by the Insurance Research Council

(cont'd from p. 5) "People thought there was a checkpoint around every corner," notes Maj. Ralph Price of the state highway patrol. Creating this perception was critical to success.

Generate media coverage: Television, radio, and newspaper announcements encouraged motorists to buckle up and warned about the \$25 ticket for failure to do so. All of the \$4 million in fines collected went to local schools.

Paid messages, used during the first two years, were augmented and later superseded by extensive media coverage. Officials visited checkpoints and granted interviews to local journalists. Weekly news releases reported the checkpoints held in each community and citations issued, including criminal offenses detected.

"You don't have to buy a lot of advertising to get the message out," says Joe M. Parker, director of the Governor's Highway Safety Program. "State news organizations provided extensive coverage of the increased enforcement and reasons for it.

And we worked to keep interest up by traveling around the state and arranging events to garner maximum attention."

Also reported were increases in belt use and decreases in alcohol-impaired driving and how these successes translated into lives saved and injuries averted.

"When you put figures in front of people, show fatalities are down along with serious injuries and that you saved in health care costs, that really has an effect," says Capt. Ennis.

A model for others: The North Carolina initiative served as a model. There's been increased enforcement in Georgia, South Carolina, and Florida. And programs patterned after North Carolina's have been tried in Sweden, resulting in an average 6 percent increase in driver belt use. Though belt use rates there are higher overall than in the United States, Perry Hakansson of Sweden's National Traffic Foundation says only about 65-75 percent of front-seat occupants and 50 percent in back use belts in heavily populated areas.

found that 61 percent of U.S. respondents polled in 1996 favored use of red light cameras. The highest support was found in large cities, where 83 percent of respondents reported favoring the devices.

Use of red light cameras is becoming more common in the United States as a countermeasure to the million-plus motor vehicle crashes that occur each year at traffic signals. Cameras help communities enforce traffic laws by automatically photographing vehicles whose drivers deliberately run red lights. Red light cameras have been used for many years in Australia, Europe, and Asia.

A red light camera system is connected to the traffic signal system and to sensors buried in the pavement at the crosswalk or stop line. The system continuously monitors the traffic signal, and the camera is triggered by any vehicle passing over the sensors traveling faster than a preset speed and a specified elapsed time after the signal has turned red.

A second picture is taken of the red light violator in the intersection. The camera records the date, time of day, time elapsed since the start of the red signal, and the vehicle's speed. Photographs are reviewed by public officials who issue tickets by mail to either the offending vehicle owner or the driver at the time of the offense, depending on state law.

For a copy of "Evaluation of Red Light Camera Enforcement in Oxnard, California" by R. Retting et al., write: Publications, 1005 N. Glebe Rd., Suite 800, Arlington, VA 22201.



A red light camera captures a close call at a Fairfax, Virginia, intersection.



More than two-thirds of long-distance truckers surveyed in New York said they'd driven while drowsy at least once during the previous month, and 25 percent reported falling asleep at the wheel at some point in the past year.

These are the findings of a 1997 survey of 593 drivers at New York truck stops and inspection stations by researchers from the State University of New York at Albany. The study revealed that federal hours of service regulations are regularly breached. Nearly half of surveyed truckers said they sometimes, often, or always drive more than the 10 hours the rules permit, take off less time than the required 8 hours, or drive longer than they report in their logbooks.

Factors associated with drowsy driving and falling asleep at the wheel include tight delivery schedules and reported violations of hours-of-service rules. For example, drivers were asked how often they had driven while drowsy in the past month. Of those drivers who said they always or often exceeded the legal limit of 10 hours, 39 percent reported driving while drowsy more than occasionally. In contrast, 12 percent of drivers who said they never exceeded the 10-hour limit reported more than occasional drowsy driving.

Hours-of-service regulations are currently under review by the Federal Highway Administration, the agency charged with regulating commercial truck drivers. Safety advocates want to tighten the rules, and trucking groups generally seek fewer restrictions on the amount of time drivers can spend on the road (see *Status Report*, Vol. 32, No. 6, July 26, 1997).

"Many studies have shown a relationship between long driving hours and increased crash risk," says Institute President Brian O'Neill. "This study is one more indication of why it would be a mistake to allow truckers to spend more than 10 hours behind the wheel."

The study "Work and Sleep/Rest Factors Associated with Driving While Drowsy, Experiences Among Long-Distance Truck Drivers" by A. McCartt et al., appears in the *41st Annual Proceedings of the Association for the Advancement of Automotive Medicine*.

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