Special issue: what works and doesn't work to improve highway safety

STATUS REPORT

INSURANCE INSTITUTE FOR HIGHWAY SAFETY

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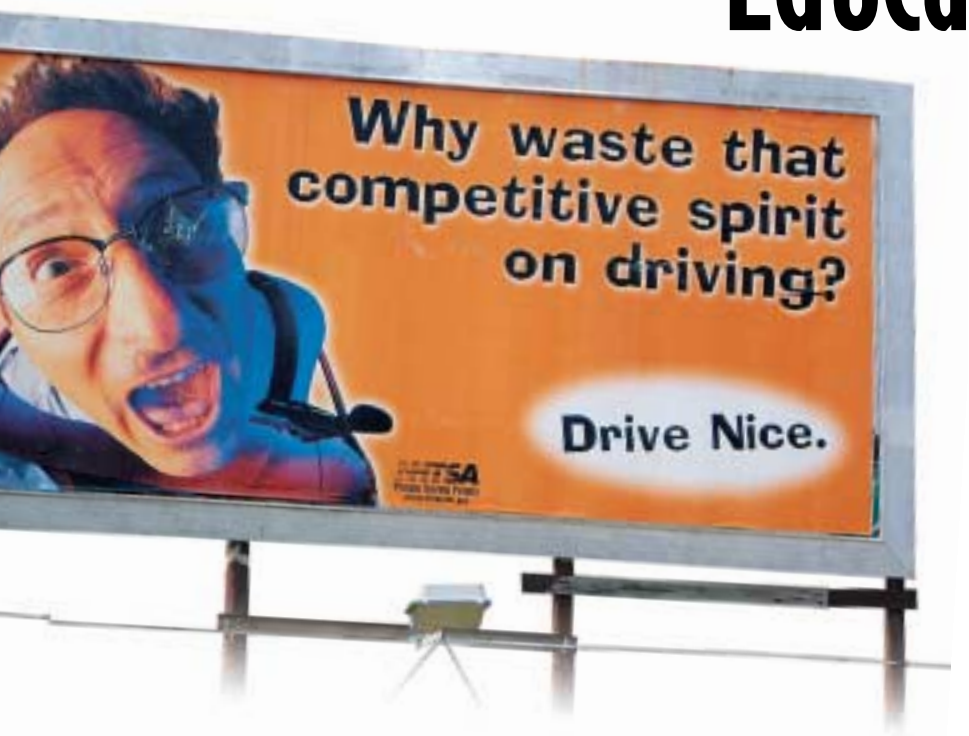
Education alone won't make drivers safer. It won't reduce crashes.



A billboard message by itself won't improve drivers or yield other safety benefits. Such messages waste resources and drain energy from effective highway safety approaches.

Highway safety is a much broader field now than it used to be. The focus has expanded from trying to prevent crashes by educating people to change their behavior. This approach was too narrow. And it failed because education alone almost never changes driver behavior. For more than 30 years, highway safety professionals have recognized that what's needed to reduce crash losses is a mix of measures aimed at drivers, vehicles, and the roadway environment. Today's vehicle and road safety programs are based largely on research and engineering. But when it comes to changing the behavior of drivers and others on the road, research findings often are ignored. Many programs are based on wishful thinking instead of science. This Status Report summarizes what the research literature tells us works — and what doesn't — to influence driver behavior for the better.

In the beginning, it was all about educating drivers to prevent crashes.

Before there were safety belts or airbags, before vehicles had crumple zones and padded interiors, before guardrails and breakaway signposts were used on highways and shoulders were cleared of roadside hazards, there were "Please Drive Safely" signs. Trying to prevent crashes by educating motorists was the almost exclusive focus of highway safety efforts for half a century, beginning soon after cars began to proliferate on the roads in the early 1900s. The entire idea of reducing the consequences of crashes wasn't a consideration.

A few advocates for a broader approach wanted to include things like installing and using safety belts to reduce deaths and injuries during crashes. These lone voices were ignored by the safety establishment of the time, but they didn't fade away. They continued to grow, which made the existing road safety establishment uncomfortable. This discomfort was apparent in 1961 remarks to the National Safety Congress by the president of General Motors, who criticized the work of "self-styled experts" whose "suggestion that we abandon hope of teaching drivers to avoid traffic accidents and concentrate on designing cars that will make collisions harmless is a perplexing combination of defeatism and wishful thinking."

The whole idea of reducing the consequences of crashes — the deaths, injuries, and property damage — used to be ignored in favor of trying to prevent crashes by persuading drivers to be more careful. A few advocates spoke up for a broader mix of approaches, and eventually these voices won out.

Science wins out: A few years later, the "self-styled experts" prevailed. Legislation enacted in 1966 gave the federal government its first major responsibility for highway safety. As a direct result, the focus of safety efforts became much broader.

The new approach sought to reduce crash losses by focusing not only on driver behavior and crash prevention but also on reducing injury risk during crashes and mitigating the consequences after crashes by, for example, decreasing the likelihood of fuel leaks that could lead to postcrash fires. Equally important was an unprecedented emphasis on scientific methods to evaluate highway safety programs.

This systematic, scientific approach has saved thousands of lives and prevented countless injuries since implementation in the 1970s. Today's passenger vehicles are much safer. So are roadways. And there has been progress toward improving the behavior of drivers and other road users.

Mix of approaches needed: Because most motor vehicle crashes involve driver error, some people continue to this day to believe that improving driver behavior should be the overriding priority. Claims continue to be made that "getting rid of drunk drivers" or "improving driver skills" is more important than setting speed limits or equipping cars with airbags. Such claims persist despite evidence gathered over the years that many driver-oriented prescriptions are ineffective. Besides, they're easier said than done. Major efforts around the world to "get rid of drunk drivers," for example, haven't succeeded in wiping out the problem of alcohol-impaired driving.

Crash deaths and injuries occur in events ranging from pedestrian impacts to collisions involving tractor-trailers. No single program or approach can have a major effect on such a range of crash types. We need a broad mix of science-based measures aimed at drivers, vehicles, and roadways. There's no reason to prefer measures aimed at drivers over those aimed at the other two. Preference should go to programs shown to be effective.

What doesn't work: education alone is ineffective at best; can even increase risk.

Safe driving behaviors like staying within speed limits, heeding stop signs, and using safety belts have to be performed over and over again. Research indicates that education has no effect, or only a very limited effect, on behaviors like these. The education might increase drivers' knowledge (for example, about the benefits of using belts), but the expanded knowledge usually doesn't result in behavior changes.

Yet support persists for programs like high school driver education; motorcycle education and training; education to increase safety belt and helmet use; and improvement programs for problem drivers, young drivers, and/or drivers in general. Such programs are commonplace, but many of them never get evaluated, typically because of their common-sense appeal. "Who can argue against the benefits of education or training?" asks Institute chief scientist Allan Williams. "But when good scientific evaluations are undertaken, most of the driver improvement programs based on education or persuasion alone are found not to work."

An example is driver education, the subject of worldwide review (see *Status Report*, Jan. 11, 1997; on the web at www.highwaysafety.org). According to Jon S. Vernick of Johns Hopkins, author of one literature review, "There's no evidence that high school driver education reduces motor vehicle crash involvement rates for young drivers."

After reviewing motorcycle rider education/training programs in three countries, Dan Mayhew of Canada's Traffic Injury Research Foundation reports "no compelling evidence that rider training is associated with reductions in collisions." Nor does a study of a bicycle education program in Australia show any evidence that participation "led to a reduced risk of bicycle-related injury in subsequent years."

The Australian "bike ed" program might even have made things worse by inadvertently leading children "to undertake a level of risky activity that they would not have attempted without the 'license' provided by having completed the program." This is the conclusion of lead author John Carlin of the Murdoch Children's Research Institute and University of Melbourne.

There's no reason to prefer highway safety efforts aimed at drivers over those aimed at vehicles or roads. Preference should go to programs shown to be effective.

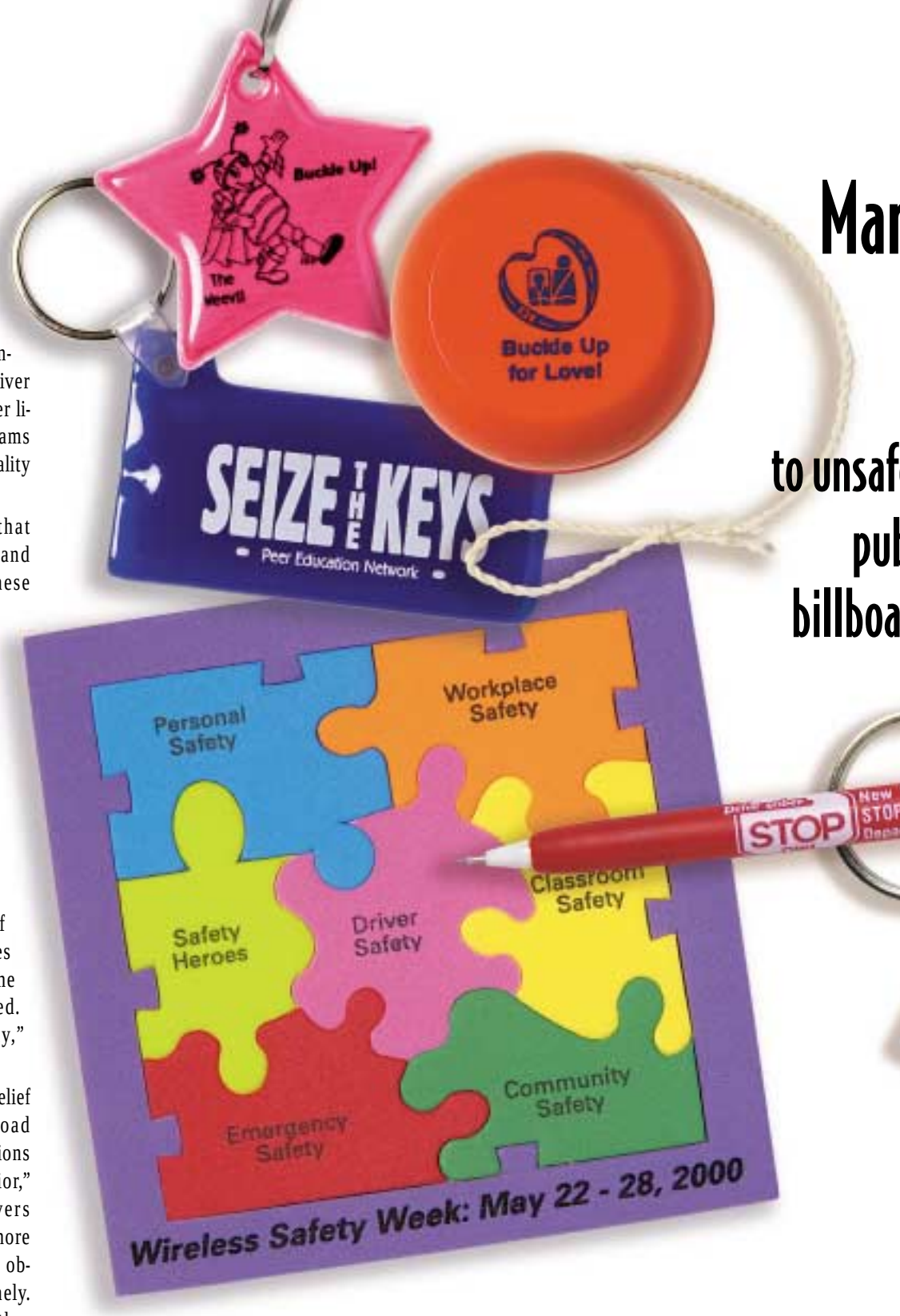
Education can be risky: Carlin isn't the only researcher to find that an education, persuasion, or training program might make things worse, either by increasing exposure, engendering overconfidence, or somehow rewarding risky behavior. Vernick points to another example: "Because high school driver education programs contribute to earlier licensure for young drivers, these programs may actually increase motor vehicle fatality rates for young persons."

Other examples include courses that teach skid control, off-road recovery, and other emergency maneuvers. When these were taught to young men, the outcome was adverse. "Males who received training had higher crash rates than those who did not take the training. Authors of the relevant studies have suggested that males trained in these skills become overconfident in their ability and now take unnecessary risks," Mayhew says.

Such unexpected and unintended outcomes underscore the importance of conducting scientific evaluations of all intervention programs. Then the ones that either don't work or exacerbate the problem can be changed or abandoned. "This hasn't happened sufficiently," Williams says.

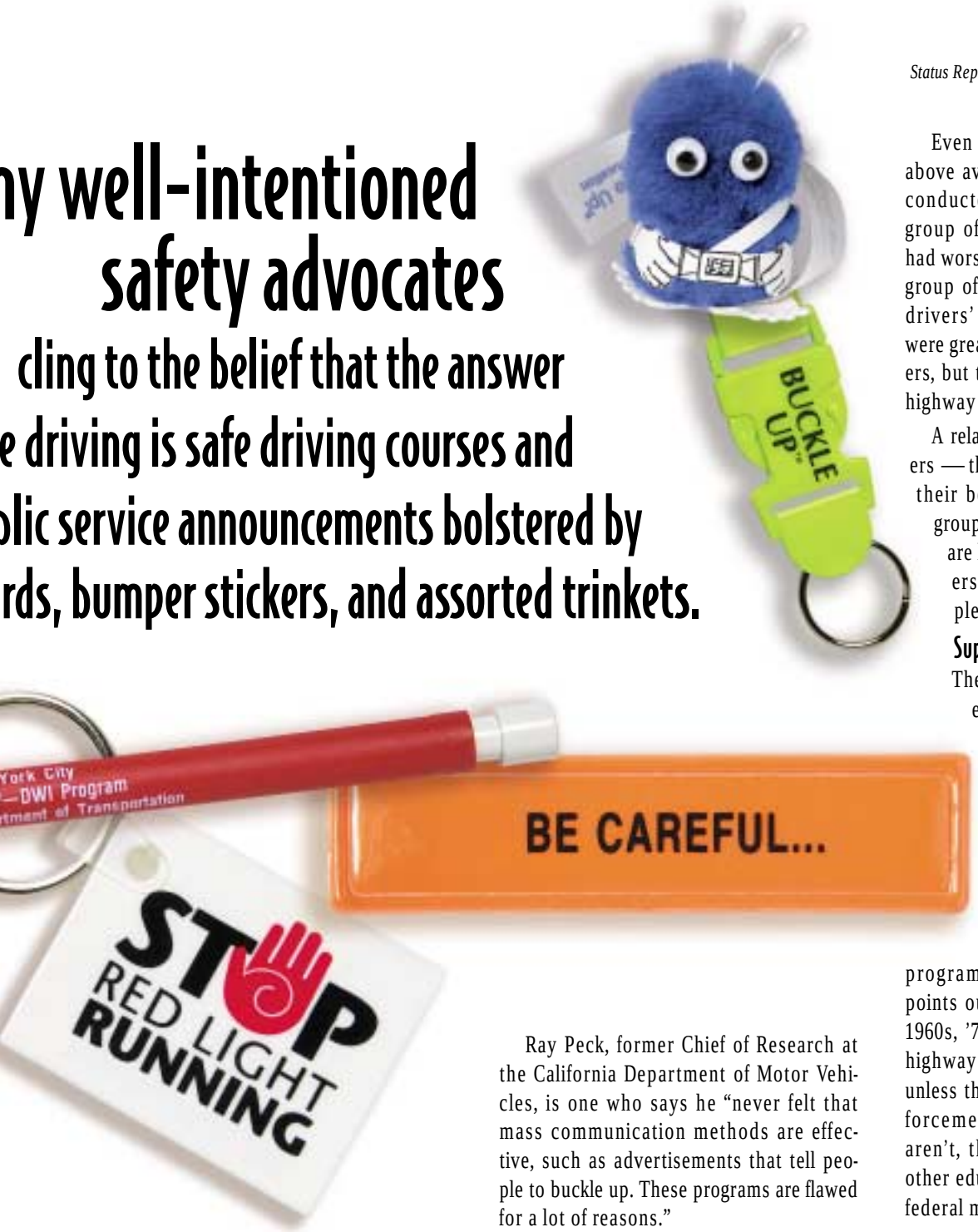
Knowledge alone isn't enough: "The belief that increasing motorists' or other road users' knowledge will change their actions reflects a naive view of human behavior," Williams adds. "At one level all drivers know, for example, that it's wrong to ignore stop signs and run red lights. Yet these obviously unsafe behaviors occur routinely. They're leading causes of crashes. Another example is that by now all motorists know driving after consuming significant amounts of alcohol increases crash risk, but millions of trips are taken each year by seriously impaired drivers."

An analogy involves educating students about drug use. One of the most prominent efforts, the Drug Abuse Resistance Education Program (DARE), began in California in the early 1980s. Now DARE is in 80 percent of U.S. school districts plus many other countries. Yet numerous studies have found the DARE curriculum, which features police officers teaching in classrooms, ineffective. Richard Clayton, director of the Center for Prevention Research at the University of Kentucky, authored one of the studies. "When we have something as complex and as hidden as drug abuse among adolescents, our usual answer to it is more education .... It makes us, as adults, feel good that they're getting this information, but we know information oftentimes doesn't carry much weight. We've got to step back and ask, 'Is education ever the best magic bullet?' I, for one, don't think it is."



ny well-intentioned safety advocates

cling to the belief that the answer e driving is safe driving courses and olic service announcements bolstered by rds, bumper stickers, and assorted trinkets.



Most messages go unheeded: The roadside sign shown on the cover of this *Status Report* implores motorists to "Drive Nice." This is the National Highway Traffic Safety Administration's way of addressing aggressive driving, a widespread problem that warrants attention (see *Status Report*, Dec. 5, 1998; on the web at www.highwaysafety.org). But don't expect the sign to do any good. It's a prime example of wasting resources on an ineffective approach.

Ray Peck, former Chief of Research at the California Department of Motor Vehicles, is one who says he "never felt that mass communication methods are effective, such as advertisements that tell people to buckle up. These programs are flawed for a lot of reasons."

Signs may impart information, but the added knowledge doesn't necessarily result in safer driver behavior. Why not? The answer goes to the crux of the failure of education alone. When surveyed, most drivers rate their own skills above average. Some rate their skills about the same as the average, but virtually none say they believe they're below-average drivers. So most drivers don't believe they need to be educated. They do believe in education, but they believe it's for all the other "bad" drivers on the road, not themselves.

Even drivers whose skills actually are above average may not be safer. Research conducted in the early 1970s involved a group of highly skilled race drivers who had worse on-the-road crash records than a group of average motorists. The race car drivers' knowledge and skills obviously were greater than those of the average drivers, but this didn't translate into enhanced highway safety.

A related problem is that high-risk drivers — the ones who most need to change their behavior — are the most difficult group to influence. Safety belt use rates are lower among young drivers, speeders, and other risk-takers, for example, than among drivers in general.

Support for education continues apace: The failure of education alone to influence drivers hasn't kept it from being encouraged under U.S. law. The Transportation Equity Act for the 21st Century allows states to use some federal highway safety program funds to produce and place media messages. This law does require yearly assessments of program effectiveness but, as Williams points out, "television commercials in the 1960s, '70s, and '80s didn't help improve highway safety, and they won't help now unless they're coupled with meaningful enforcement of traffic safety laws. If they aren't, then the commercials and all the other educational efforts will be a waste of federal monies."

Education still is tried the world over. Dinesh Mohan, who is Henry Ford Professor for Biomechanics and Transportation Safety at the Indian Institute of Technology, says "the education debate gets resurrected every day .... A very large number of countries have safety messages on television, have put up billboards on thoroughfares, hold road safety weeks, distribute safety literature in schools, and have instituted safety committees and councils. This has been going on for two decades, but the carnage continues."

Importance of traffic safety laws: with publicity and education, laws change behavior

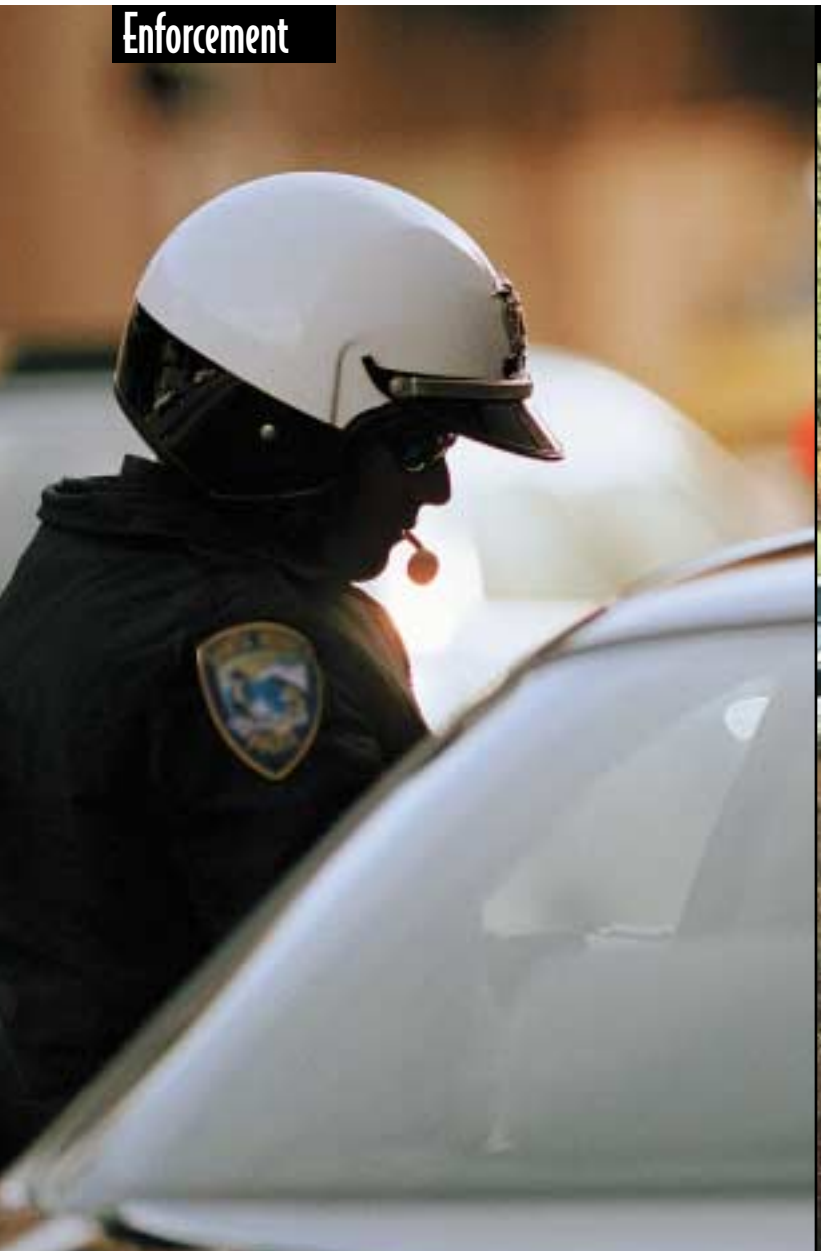
Most demonstrable improvements in driver behavior come from traffic safety laws. The clearest examples are those where the behaviors are readily observable and the changes are measurable — belt use, motorcycle helmet use, or travel speeds.

Victoria, Australia, enacted the first safety belt law in 1970. Use rates, which had been 18-26 percent, immediately jumped to 75 percent in urban areas and 64 percent on rural roads. When other Australian states passed similar laws, each experienced big jumps in rates of buckling up.

But in North America, belt laws by themselves didn't have the same effect. Canadian authorities added a program of periodic intensive enforcement, and the laws in some provinces were strengthened to include points on drivers' licenses as part of the penalties. These approaches paid off. Driver belt use in Canada has topped 90 percent since 1994, as high as anywhere in the world.

While education to change driver behavior almost never is effective by itself (see p.3), it's beneficial when it enhances the effectiveness of traffic safety laws. It can build public support to enact the laws in the first place. Then education can enhance enforcement by increasing motorists' perceptions of the risk of apprehension.

This is well documented in Australia, where extensive and creative highway safety advertising runs frequently on television and other media. The advertising works, according to professor Peter Vulcan of Monash University in Victoria, "only when it is done in direct support of high levels of enforcement, usually highly visible enforcement. You can start the process with voluntary



compliance with traffic safety laws, but then to get the majority of road users to comply you need enforcement that is magnified by publicity."

Benefits accrue even without high compliance: Compliance with traffic laws varies considerably. The greater the compliance, the more effective the laws. If motorists don't know about a law or don't believe it will be enforced, compliance will be limited.

But even laws that frequently are violated can have positive effects. A good example is speed limits. Many drivers routinely exceed them, but there's still a safety benefit because drivers typically won't go more than 10 mph faster than a posted limit. Thus, when speed limits were 55 mph most drivers went 55-65 mph. When the limits were increased to 65 mph, motorists sped up to 65-75 mph.

This behavior has nothing to do with choosing safe speeds to drive. It has everything to do with the perception that speed limits actually are being enforced at about 8-10 mph above what's posted.

Motorists are much more likely to change their behavior in response to traffic laws than because of education about what increases crash risk. In large part, this is because motorists believe their driving skills will enable them to avoid collisions. At the same time, they recognize their skills won't enable them to avoid a ticket. So they slow down, buckle up, or otherwise comply with the laws.

Keeping the focus on what works: The time and money spent promoting highway safety strategies that don't work steal critical resources from those that do. Advocates of such programs may bring much needed public attention to problems, but the same voices could be more effective if their efforts were used to support countermeasures shown to work by scientific research.

The effective programs are the ones that combine education with traffic law enforcement. This combination is the key to changing driver behavior.

Exception that proves the rule: when education alone works

There are a few instances when education alone can be effective in changing people's behavior. Children's behavior generally is easier than adults' to change, and some child pedestrian programs have been successful (see *Status Report*, March 13, 1999; on the web at www.highwaysafety.org).

Messages aimed at adults are more likely to be effective if the audience has something tangible at stake, like maintaining a job performance record. An alcohol education program at a U.S. Air Force base succeeded largely because psychiatric referral or discharge could be a consequence for getting in a crash involving alcohol use.

Education programs that are longer and more extensive are apt to work better than shorter or limited efforts. It's beneficial if the communicator has high credibility and if the desired behavior has to be performed only once — for example, if a doctor recommends installing a smoke detector — instead of repeatedly over time.

But even gains from long-term education may diminish. Long-running anti-smoking programs have contributed to overall reductions in tobacco use, for example, but in the early to mid-1990s there was a surprising upswing in teen smoking.

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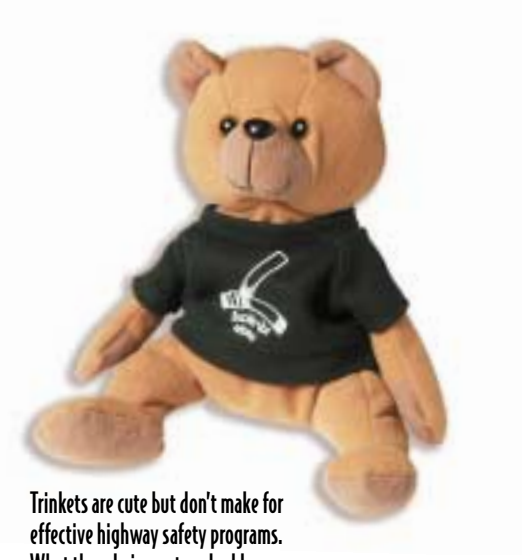

Trinkets are cute but don't make for effective highway safety programs. What they do is waste valuable resources.

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