

STATUS REPORT

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LOW-HANGING FRUIT

Oftentimes saving a life on the road is as basic as getting people to slow down, buckle up, or don a helmet. Tried and true countermeasures like these usually don't grab headlines, but if they were more widely propagated across the nation they would yield an immediate reduction in motor vehicle crash deaths.

The number of people who die in crashes in the United States is at a record low. Still, there were an estimated 32,788 motor vehicle crash deaths last year, according to a preliminary projection by the National Highway Traffic Safety Administration (NHTSA).

Vehicles are safer than ever, and emerging technologies

are starting to pay dividends in terms of preventing crashes or lessening their severity (see *Status Report*, July 19, 2011; on the web at ihs.org). New safety features take time to work their way through the vehicle fleet, though, so benefits can be delayed for years.

"While we're looking for the next big breakthrough in vehicle safety, we should keep in mind that many existing strategies at the driver and passenger level still can yield gains," says Adrian Lund, Institute president. "Not only can most of these countermeasures be put to work now, but the benefits also would be swift."

State laws have helped lift use of safety belts and motorcycle helmets and lower teenage driver crash rates. DUI/DWI laws and sobriety checkpoints have reduced alcohol-impaired driving. Red light cameras and speed cameras have gotten drivers to obey traffic signals and slow down, while roundabouts have reduced intersection crashes.

Still, lots of drivers flout traffic and restraint laws, intersection crashes and speeding-related ones continue to be deadly, and some teenagers take risky chances that have tragic endings.

"We already have the tools to address these problems," Lund says, "but they need to be better utilized." Basic doesn't mean easy, he adds. "Making headway in many cases would require some state lawmakers to make bold moves to enact tough, enforceable laws."

A stumbling block is getting the public and state and local politicians on board with proposed changes. Red light cameras and speed cameras are especially divisive, even though public opinion surveys show solid support for using cameras to enforce traffic laws. Motorcycle helmet laws can be just as controversial. Antihelmet groups pressure state legislators every year to overturn helmet laws or reject proposals for new ones. This is in spite of the fact that helmets are the No. 1 countermeasure for preventing rider deaths in crashes.

What follows is an overview of some proven countermeasures with quick payoffs.

Enact primary belt laws: Using safety belts is the single most effective way to reduce deaths and injuries in crashes. Safety belts saved 12,713 lives in 2009, NHTSA estimates. If all passenger vehicle occupants 5 and older involved in fatal crashes had been restrained, an additional 3,688 lives could have been spared.

Safety belt use is up sharply from just a decade ago, thanks to a combination of high-visibility enforcement via a nationwide Click It or Ticket campaign, passage of primary belt laws, and enhanced in-vehicle belt reminders (see *Status Report*, July 11, 2009). The national belt use rate climbed to 85 percent in 2010, data from NHTSA's National Occupant Protection Use Survey indicates.

States with primary belt laws, which allow police officers to stop motorists solely for not buckling up, generally have higher use rates. Thirty-two states and the District of Columbia have primary belt laws. Rhode Island is the latest state to upgrade to primary enforcement. In other jurisdictions, police must have another reason to stop a vehicle before citing an occupant for failing to buckle up. Only New Hampshire lacks a belt law. Belt use is lower among back-seat occupants than front-seat ones. Laws in just 26 states and D.C. cover everyone in the vehicle, whether riding in front or back.

Institute research has shown that switching from a secondary to a primary law reduces passenger vehicle driver deaths by 7 percent. If all states with secondary laws upgraded to primary laws, an additional 284 lives would have been saved in 2009.

Another way to boost belt use is to increase fines for belt law violations. A recent NHTSA-sponsored study found that increasing fines from the national median of \$25 to \$60 results in gains of 3 to 4 percentage points in belt use. Raising fines to \$100 increases belt use even more (see *Status Report*, March 1, 2011).

Mandate helmets for all riders: Helmets saved the lives of 1,483 motorcyclists in 2009, NHTSA estimates. If all motorcyclists had worn them, an additional 732 lives could have been saved. Helmets are estimated to be 37 percent effective in preventing fatal injuries to motorcycle drivers and 41 percent effective for motorcycle passengers.

Nearly all motorcyclists wear helmets in states with universal helmet laws covering riders of all ages, but only about half do when states either don't have a law or the rules only apply to some riders. Twenty states and D.C. have universal helmet laws, and 27 states have partial helmet laws usually covering younger riders. Illinois, Iowa, and New Hampshire don't require helmets at all.

In 2010, 98 percent of motorcyclists observed in states with universal helmet laws were wearing helmets. In states without such laws, use was 48 percent. Based on helmets judged to be compliant



SAFETY BELTS SAVED 12,713 LIVES IN 2009



MOTORCYCLE HELMETS SAVED 1,483 LIVES IN 2009

with federal safety regulations, use was 76 percent in states with universal laws and 40 percent in states without such laws.

Many states specifically require helmets that meet U.S. Department of Transportation performance standards. A growing number of riders, however, choose flimsy helmets that don't meet these standards. Novelty helmets put riders in a crash at higher risk of a brain injury or skull fracture than compliant ones. To curb the problem, NHTSA has issued new labeling requirements that take effect in May 2013 (see *Status Report*, Sept. 11, 2007, and July 19, 2011).

Toughen teen driver laws: Teenage drivers have the highest crash risk per mile traveled, compared with drivers in other age groups. One proven way to reduce this risk is through graduated licensing laws that

phase in driving by young beginners as they mature and develop skills. States with these systems have reduced teen crashes 10-30 percent.

Whether a state has a strong graduated licensing law matters in terms of safety. In 2009 researchers at the Institute and affiliated Highway Loss Data Institute evaluated the effects of various provisions of teen licensing laws on fatal crash rates and rates of insurance collision claims for 15-17-year-old drivers. The findings indicate strong benefits of restricting when teens are allowed to drive and how many teen passengers may ride along (see *Status Report*, May 7, 2009).

Delaying licensure and permit age helps to reduce teen drivers' fatal crashes, and requiring more practice driving hours lowers teenagers' risk of collision claims. Delaying licensure from 16 to 17, for example, lowers the fatal crash rate among 15-17 year-olds by 13 percent.

beginning by 10 p.m. or earlier and restricting teen passengers to 1 at most. Nearly half said these restrictions should last at least until age 18 (see *Status Report*, Aug. 3, 2010).

Strong GDL laws might not be a hard sell for teens either. The majority of 15 to 18 year-olds polled in a 2010 Allstate Foundation survey said they favor night driving restrictions that begin at 9 or 10 p.m. and restrictions that limit teen passengers to 1 or none.

Pending before Congress is the STANDUP Act, or Safe Teen and Novice Driver Uniform Protection Act, which would create a national model for graduated licensing and provide grants to states for enacting the basic tenets.

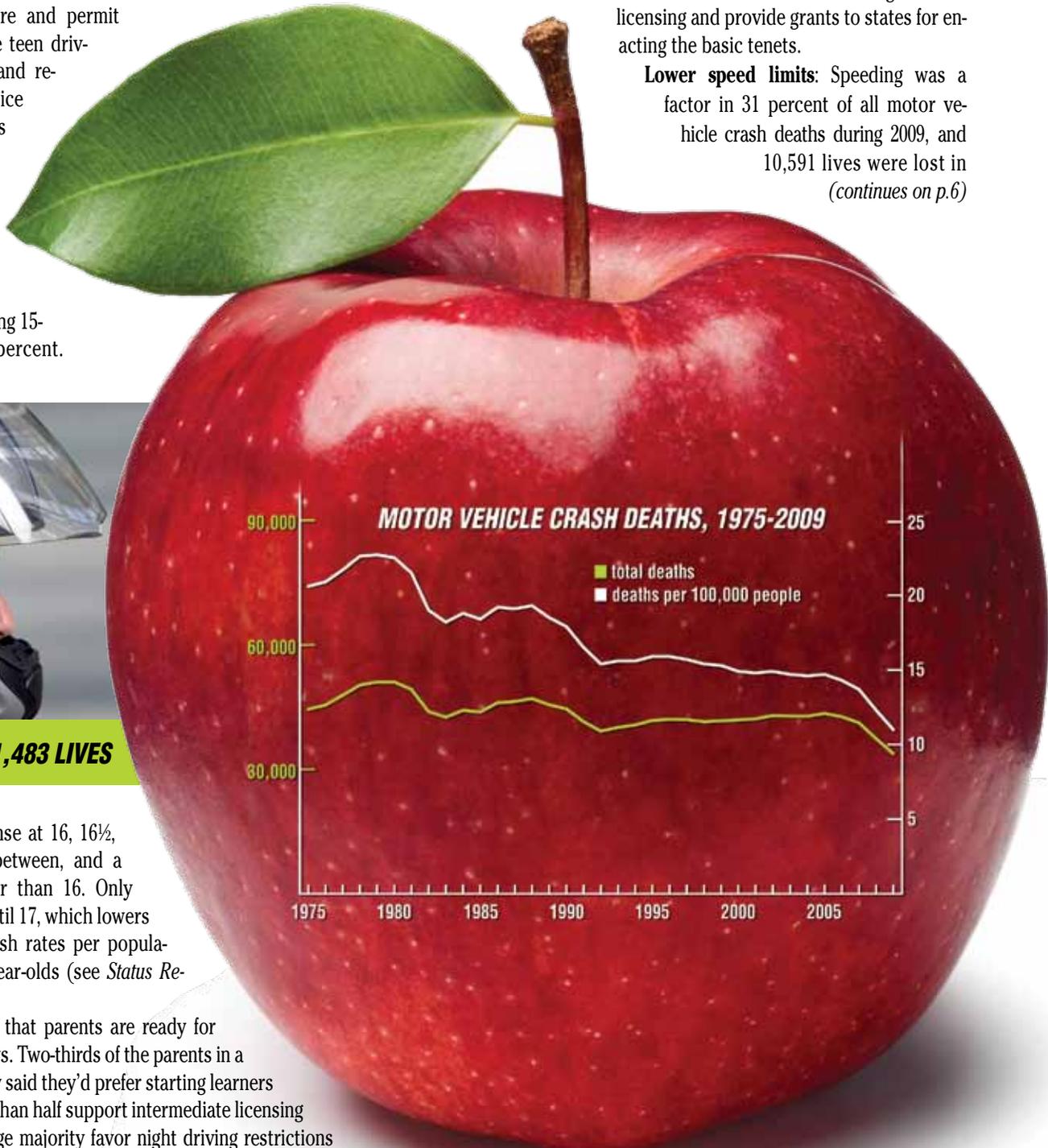
Lower speed limits: Speeding was a factor in 31 percent of all motor vehicle crash deaths during 2009, and 10,591 lives were lost in
(continues on p.6)



CYCLE HELMETS SAVED 1,483 LIVES

Most states license at 16, 16½, or somewhere in between, and a few license younger than 16. Only New Jersey waits until 17, which lowers fatal and injury crash rates per population among 16-17 year-olds (see *Status Report*, Sept. 9, 2008).

Surveys indicate that parents are ready for strict teen driver laws. Two-thirds of the parents in a 2010 Institute survey said they'd prefer starting learners at 16 or older. More than half support intermediate licensing at 17 or older. A large majority favor night driving restrictions



KIDS SHOULD USE REAR-FACING SEATS AT LEAST UNTIL 2

Until recently, as soon as a 1 year-old tipped the scale at 20 pounds, it was a signal to turn around the car seat. Child safety advocates have long urged parents not to be in such a hurry, and now it's official. The American Academy of Pediatrics recently updated its guidelines to make it the norm for children to ride rear-facing until age 2. The National Highway Traffic Safety Administration (NHTSA) also is recommending that toddlers remain rear-facing as long as possible.

The new guidelines are aimed at promoting best practices in child passenger safety, but one thing they can't do is provide simple solutions for parents. The full recommendation from the pediatricians' group is that children should be rear-facing until age 2 or until they reach the height or weight limits of their restraints. The reality is that it's not always possible to use a rear-facing restraint until age 2 while also heeding limits set by a seat's manufacturer. Beyond age 2, parents also are encouraged to keep their children rear-facing if they haven't reached the height or weight limits.

When to switch from rear-facing to front-facing is just one in a dizzying series of decisions parents must make about child seats, and confusion can lead to misuse. A 2004 federal study found that child seats were misused in a way that could increase the risk of injury 73 percent of the time. Efforts such as the Institute's booster seat ratings for belt fit have had some success in simplifying the process, but it's still not easy.

"Any restraint is better than none, but to be most effective, it's important that the restraint fits both the child and the vehicle," says Anne McCartt, Institute senior vice president for research. "Unfortunately, the burden is on parents to sift through multiple rankings and instruction manuals — and still be prepared for some trial and error — to find the right seat and make sure they're using it correctly."

When it comes to the updated guidance on rear-facing restraints, there is good reason for the change. During a crash, rear-facing child seats provide more support for the head, neck, and spine, which is why children should use them for as long as possible, even beyond the 2-year mark if their seats still fit.

That advice would be easier to follow if all convertible child restraints — the type used after a child has outgrown an infant seat — had height and weight limits that could accommodate the typical 2 year-old in the rear-facing position. While many convertible seats now have rear-facing limits of 40 pounds or more, others have lower limits. A tall, skinny child may outgrow the height limit before reaching the maximum weight.

Some parents may choose to buy another seat rather than allow their children to ride forward-facing before age 2. For many families that's not an option, either because of the expense or because they drive a small car that can't accommodate a bigger child restraint.

Which seat for which vehicle? The question is one NHTSA has been studying. The agency announced in 2009 that it would launch a voluntary program in which automakers could identify specific child seats — rear-facing, front-facing, and boosters — that fit their vehicles (see *Status Report*, June 11, 2009; on the web at iihs.org). Details are still being hammered out, and the Institute and other organizations recently submitted comments to NHTSA on the proposal.

The issue is complicated because of differences in the placement of safety belts and LATCH anchors for child restraints, the width of vehicle seats, and other factors.

The plan calls for automakers to offer choices for children of different ages in three different price ranges, each from a different manufacturer. NHTSA is proposing that recommended seats fit in all rear seats. Nissan and Infiniti already recommend ones for their vehicles, but most automakers don't.

Consumers Union, publisher of *Consumer Reports*, has pointed out that some restraints fit well in the second row of vehicles but not the third. Requiring seats to fit in every seating position could end up driving the market toward smaller rear-facing seats



that can't accommodate heavy children, the group cautioned in a comment to NHTSA.

The Institute told NHTSA that boosters should be evaluated for belt fit before being recommended. Boosters help position a safety belt correctly on a child's body, so when judging whether a booster fits a vehicle, it's important to look at belt fit. If manufacturers fail to do so, they could end up recommending a booster that positions the belt incorrectly.

The Institute is urging the agency to incorporate into the program a belt-fit procedure that uses a child-size dummy, similar to the method the Institute uses to rate boosters according to how well they position belts on a typical child in most vehicles.

The proposed program might not simplify things immediately since it will add yet an-

HOW KIDS SHOULD RIDE

All children should ride rear-facing until they are at least 2 years old or until they reach the rear-facing height or weight limits of their child restraints. Only then should they ride forward-facing in convertible or other forward-facing child restraints.

Children should continue riding in harness-equipped, forward-facing restraints as long as possible, up to the height and weight limit of the seats. After that, they should use belt-positioning booster seats until adult safety belts fit properly, usually when the child's height reaches 4 feet 9 inches. Children should ride in the rear seat until at least age 13.

For more information on child restraints, see the Institute's updated video, "Keeping Children Safe in Crashes," available at iihs.org/research/topics/child_restraints/default.html.

other layer of information for parents to sift through. NHTSA rates child seats on ease of use, the Institute evaluates boosters for belt fit, and *Consumer Reports* rates child seats for crash protection, ease of use, and fit in a variety of vehicle types. The various ratings programs don't always give the highest marks to the same seats.

Alisa Baer, a New York pediatrician who runs The Car Seat Lady website, is skeptical about the value of a vehicle-child seat compatibility list. She says it doesn't address "the larger problem of widespread incompatibility" and says NHTSA should focus its energy on mandating designs that will eliminate common problems. For example, safety belt anchor points in the center of many vehicles are too narrow for child seats and should be set wider apart, she says.

Nudging the industry: NHTSA hopes the program will lead to improvements in both vehicle design and child seat design, as the two industries "will likely have to work together to address the need for increased compatibility," the agency said in its request for comments.

The new physicians' guidelines also are expected to lead to improvements — in particular, more seats that can accommodate heavier children in rear-facing mode.

Another change that could broaden the options for rear-facing seats has been proposed by Volvo. The Swedish automaker designs child seats for its own vehicles for all ages but in the United States offers options only for older children. The seats it sells in other countries for younger children are designed to be used rear-facing until age 3 or 4.

These rear-facing seats that can handle higher weights can't be sold in the U.S. because they use a support leg that extends to the floor of the vehicle. Safety rules require child seats to pass compliance tests using only vehicle belts or LATCH attachments. Volvo wants the agency to change the regulation to accommodate seats with legs.

"In an ideal world, parents would be able to follow the rear-facing-longer recommendation without having to worry that their child will outgrow the restraint before age 2. And they'd be able to buy a seat and be confident that it will fit in their car and won't require an advanced degree to install correctly," McCartt says. "We're still a long way from that point, but the new guidelines and the focus on child seat-vehicle compatibility should push the industry in the right direction."

(continued from p. 3) speeding-related crashes. Lowering speed limits has been proven to pay big dividends. Raising them has the opposite effect (see Status Report, Nov. 22, 2003).

Congress in 1995 repealed the national maximum speed limit of 55 mph, allowing states to set their own limits. A 2009 study in the American Journal of Public Health found a 3 percent increase in road fatalities attributable to higher speed limits on all road types, with the highest increase of 9 percent on rural interstates. The authors estimated that 12,545 deaths were attributed to increases in speed limits across the U.S. between 1995 and 2005.

States continue to raise limits on interstates and major highways to 70, 75, 80, and even 85 mph. Kansas, Ohio, and Texas are the latest to allow faster speeds. The American Trucking Associations favors a national maximum limit of 65 mph for all vehicles — not just trucks — as a way to reduce fuel consumption and carbon emissions. The group has petitioned for speed limiters to restrict large truck speeds to no higher than 65 mph.

Use automated enforcement: A proven way to curb speeding and red light running is to use cameras to enforce traffic laws. The most common use in the U.S. is at intersections to record red light violations. Red light running killed an estimated 676 people and injured an estimated 130,000 in 2009.

Red light cameras saved 159 lives in 2004-08 in the 14 biggest U.S. cities with cameras, a February 2011 Institute analysis shows. Comparing these cities to those without cameras, researchers found the devices reduced the fatal red light running crash rate by 24 percent and the rate of all types of fatal crashes

at signalized intersections by 17 percent. If cameras had been operating during that period in all cities with populations greater than 200,000, a total of 815 fewer people would have died. What's more, two-thirds of drivers in these same cities with longstanding red light camera programs support their use (see Status Report, Feb. 1, 2011, and July 19, 2011).

Speed cameras are widely used in Europe but not in the U.S. (see story facing page and Status Report, Jan. 31, 2008). The cameras are associated with reductions of 8-49 percent for all crashes, 8-50 percent for injury crashes, and 11-44 percent for crashes involving fatalities and serious injuries in the vicinity of camera sites, a 2010 Cochrane Collaboration review of 28 studies found. Over wider areas, the review found reductions of 9-35 percent for all crashes, and 17-58 percent for crashes involving fatalities and serious injuries.

Institute studies in Maryland and Arizona found that the proportion of drivers exceeding speed limits by more than 10 mph fell by 70 percent and 95 percent, respectively, after cameras were introduced. Speeds also fell on roads outside the enforcement area (see Status Report, Jan. 31, 2008).

Conduct sobriety checkpoints: The proportion of fatally injured drivers with blood alcohol concentrations (BACs) at or above 0.08 percent has remained about a third since 1994 after declining from nearly half during 1982. The



Institute estimates that 7,440 deaths would have been prevented in 2009 if all drivers had BACs below 0.08 percent.

Sobriety checkpoints help to deter alcohol-impaired driving and catch violators. The Centers for Disease Control estimates that crashes thought to involve alcohol drop by about 20 percent when well-publicized checkpoints are conducted.

Police officers set up checkpoints at predetermined locations and stop all drivers, or a predetermined proportion of them, based on rules that prevent police from arbitrarily selecting motorists to stop. Officers then look for drivers who appear intoxicated or impaired and screen them.

Thirty-eight states and D.C. conduct sobriety checkpoints, the Governors Highway Safety Association says. States vary a lot in terms of numbers and frequency. NHTSA strongly supports regular use of checkpoints. The 2 keys to success are publicity and frequency. If checkpoints are held often over long enough periods and are well publicized, motorists assume police are cracking down on impaired drivers, even if other enforcement hasn't been stepped up. This helps to dissuade people from driving after drinking.

Build roundabouts: Used in place of stop signs and traffic signals, these circular intersections can significantly improve traffic flow and safety. Where roundabouts have been installed, crashes have fallen about 40 percent, and injury-related crashes have slid about 80 percent.

Some of the most common types of intersection crashes are right-angle, left-turn, and head-on collisions. These can be severe because vehicles may be traveling at high speeds. Roundabouts essentially eliminate potentially serious crashes because vehicles travel in the same direction and at much slower speeds. Keeping vehicles moving also reduces travel delays, fuel consumption, and air pollution (see *Status Report*, June 9, 2008).

"Roundabouts are the preferred safety alternative for a wide range of intersections," the Federal Highway Administration says. The agency recommends considering them for all new intersections on federally funded highway projects and also existing intersections that need major improvements.

U.S. drivers aren't as familiar with roundabouts as drivers in Europe and Australia. When they are proposed here, some motorists worry that they will be confusing and tough to navigate.

But opinions quickly change once people grow used to them (see *Status Report*, Nov. 3, 2010, and Aug. 26, 2003).

U.S. TRAILS OTHER WEALTHY NATIONS ON ROAD SAFETY GAINS

The United States could learn a lot from other countries when it comes to reducing deaths and injuries on the roads, a report from the Transportation Research Board asserts.

Crash deaths have fallen to their lowest levels on record, but other high-income countries now have lower fatality rates per vehicle mile traveled. Moreover, deaths in most other high-income countries are dropping much faster than in the U.S.

Better enforcement of speed limits and alcohol-impaired driving laws are among the reasons countries such as Australia, France, Sweden, and the United Kingdom have been so successful in reducing highway fatalities, the authors write. Roadway design measures such as roundabouts also have helped. More broadly, the report credits good management of safety programs and political support for their goals.

"The lack of progress in reducing the highway casualty toll might suggest that Americans have resigned themselves to this burden of deaths and injuries as the inevitable consequence of the mobility provided by the road system," the authors note. "In other countries, public officials responsible for the roads have declared that this human and economic cost is neither inevitable nor acceptable and have undertaken rigorous and innovative interventions to reduce crashes and casualties."

The report notes some differences between the U.S. and other countries that make comparisons difficult. For example, much of Europe is more urbanized than the U.S., and fatal crashes are more common on rural roads. Another difference is the large number of agencies — federal, state, and local — involved in road safety in the U.S. Other countries have just one central road safety agency. For instance, France has thousands of speed cameras, and they are all part of a single national network (see *Status Report*, Jan. 31, 2008; on the web at iihs.org). Nevertheless, the report identifies several safety measures in the other countries that are probably having an impact.

Some of them are pretty basic. The report notes that laws in nearly every European country, Australia, Canada, Japan, and New Zealand require motorcyclists to wear helmets. In the U.S., however, 30 states lack helmet laws that cover all riders. Many countries also boast higher rates of safety belt use than the U.S.

When it comes to alcohol-impaired driving, frequent roadside sobriety testing is the norm in many other countries. A lower illegal blood alcohol concentration threshold also may play a role: The threshold in Australia, Canada, Japan, and most European Union member nations is at or below 0.05 percent, compared with 0.08 percent in the U.S.

Other countries are more aggressive on the problem of speed. Speed limits are better enforced, often through the use of speed cameras. This enforcement is well publicized, long term, and has the support of elected officials.

"No U.S. speed management program today is comparable in scale, visibility, and political commitment to the most ambitious programs in other countries," the authors write.

"Achieving traffic safety goals in the United States: lessons from other nations" is available online at trb.org.

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