Changing America's culture of speed on the roads

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Overview

Speeding—exceeding the posted speed limit or traveling too fast for conditions—is epidemic on America's highways. Most drivers understand that speeding is dangerous, and most drivers feel that other speeders threaten their own personal safety. Yet most drivers speed: in a recent national survey, about 80% of all drivers said they exceeded the speed limit on all types of roads, from Interstate highways to neighborhood streets, within the past month, and about one-third reported that they were speeding on the day of the interview. Speeding increases both the risk of a crash and the risk of injuries and fatalities in crashes. Speeding was documented in almost one-third of all fatal traffic crashes in 2005 and probably was involved in many more.

American culture encourages speeding. Many roads are designed for speeds higher than the posted speed limit. Cars are comfortable, quiet, insulated from the road, with speedometers recording speeds over 100 mph; drivers don't feel that they are traveling fast. Television, movies, and electronic games all promote speeding. Automobile companies and car magazines advertise speed through slogans such as "0 to 60 mph in 3.4 seconds". And Americans' busy lifestyles stress that every minute counts, that in days filled with multiple appointments in different locations, we need to get from one place to the next as quickly as we can—so we speed.

Current methods for controlling speeding are virtually powerless in the face of this speeding culture. Police can detect speeders easily, but police can patrol only a tiny fraction of the nation's four million highway miles. On congested multilane roads, police cannot safely single out one car from the hundreds that speed by every minute. The common attitude is that police issue speeding tickets to raise revenue, not to protect the driving public. Automated speed enforcement has demonstrated its effectiveness in other countries but is used only rarely in America.

So what can be done to reduce speeding? The public's attitudes that accept and often encourage speeding must change, and at the same time speeding behavior must be reduced and stopped in locations and situations where the public knows that speeding is dangerous. Two good targets are 1) specific high-visibility locations, such as school zones, neighborhood streets where children live, highway work zones, and streets with heavy pedestrian crossing traffic and 2) extreme speeders who drive more than 10 or 20 mph faster than other vehicles. Well-publicized campaigns focused on these targets, using both manned and automated enforcement methods,

can begin changing public attitudes. They require vigorous local, state, and national leadership that recognizes the true role of speed in traffic crashes and injuries, makes speed a real safety priority, increases funding for speed-related programs and research, and uses leadership's "bully pulpit" to inform, encourage, and inspire America's drivers to drive at safe speeds.

Introduction and background

What is speeding?

To much of the public, speeding is like pornography: difficult to define, but we know it when we see it. And to many drivers, speeding is something that other people do: I may drive fast on occasion, but I always drive safely, you occasionally speed dangerously, he drives like a maniac.

The formal definition of speeding, and the basis on which speeding citations are written, is exceeding the posted speed limit or driving too fast for conditions. All United States roads have a speed limit, established by the state or municipality (TRB 1998, 21). General speed limits apply to all roads in a class, such as rural Interstates or local streets. States and municipalities may establish speed zones with different speed limits on road segments where they determine that the general speed limit for the road class is too high or too low for that segment.

Although speed limits should establish the maximum safe speed on every road segment and, consequently, should define speeding clearly, in practice they often do not. General speed limits may well be too high or too low for specific road segments. States and municipalities do not establish speed zones for many of these road segments: they don't have the resources to conduct engineering assessments and post speed-limit signs, they believe that changing speed limits every few miles would confuse drivers, or they react to public pressure to maintain general speed limits (TRB 1998, 82). Consequently, many drivers believe that they will not be ticketed for speeds less than five or sometimes ten mph over the posted limit (Royal 2004). This belief is correct: police in most jurisdictions have an informal and unwritten "speeding tolerance" over the posted speed limit and will not write a ticket unless a driver exceeds this tolerance (GHSA 2005).

Because neither drivers nor police believe that speed limits mean what they say, it's no surprise that speed limits are widely, and on some roads almost universally, ignored. Most drivers admit to speeding on all types of roads.

Driving too fast for conditions—the second part of the speeding definition—is far more subjective but is useful because it attempts to identify where and when speeding is dangerous. The best estimates of how frequently it occurs come from crash data. NHTSA considers a crash to be speeding-related if a driver was charged with a speeding-related offense or if the investigating officer indicated that racing, driving too fast for conditions, or exceeding the posted speed contributed to the crash. Using this definition, NHTSA estimated that speeding was involved in 30% of fatal crashes in 2005 and that speeding-related crashes claimed 13,113 lives (NHTSA 2006). Law enforcement officers consider the true role of speeding to be much greater than this. In their experience, speeding is involved in almost all serious crashes.

The consequences of speeding

Speeding affects both the probability of a crash and the severity of injuries produced by a crash. Over 100 studies, summarized in Elvik (2005) and Aarts and van Schagen (2006), document three effects of speed on crashes and injuries. First, the probability of a crash is approximately proportional to the square of the travel speed. Second, in a crash, injury risk is approximately proportional to the impact forces on a person, which in turn are proportional to the square of the impact speed. These two effects can be summarized in a general rule of thumb:

> *When travel speed increases by 1%, the injury crash rate increases by about 2%, the serious injury crash rate increases by about 3%, and the fatal crash rate increases by about 4%.*

The same relation holds in reverse: a 1% decrease in travel speed reduces injury crashes by about 2%, serious injury crashes by about 3%, and fatal crashes by about 4%. Consider the effect on a street with a speed limit of 35 mph and average travel speed of 40 mph. A reduction of just 2 mph, to 38 mph, is a 5% decrease, so crashes would be reduced by about 10%, serious injury crashes by about 14%, and fatal crashes by about 19%.

Finally, the probability of a crash increases as a vehicle's travel speed rises above the average travel speed of surrounding vehicles. Extreme speeders have very high crash risks. For example, someone speeding at 80 mph on a road with average speed 70 mph has about a 31% greater crash risk, 49% greater injury crash risk, and 71% greater fatal crash risk than drivers at 70 mph.

Speeding can be dangerous on all roads. In 2004, half of the speed-related traffic fatalities occurred on roads posted at 50 mph or less, and one-fifth occurred on roads posted at 35 mph or less (NHTSA 2005a, Table 118).

What's being done to reduce speeding?

All three of traffic safety's "Three E" strategies—education, enforcement, and engineering—are used in attempts to control speeding. With few exceptions, none has had much effect.

Engineering

Engineering includes designing roadways and establishing speed limits. In America, roadways often are designed and built with little consideration of either the speed limit that will be set or the operating speed that drivers will feel is reasonable and safe (NHTSA 2005b). When setting speed limits, the most important consideration has been (and continues to be) free-flowing travel speeds rather than what speed is, in fact, safe (and the next most important consideration isn't safety either—it's politics). Precisely, speed limits are set starting with the 85th percentile speed: the speed not exceeded by 85% of drivers (TRB 1988, 91; NHTSA 2005b). This means that speeding drivers can help raise speed limits, rather than speed limits helping to slow down speeding drivers. Thus, both roadway design and speed limits frequently encourage faster driving.

The effects of maximum speed limits on travel speed, crashes, and casualties have been studied extensively over the past 30 years. In 1974, the 55 mph National Maximum Speed Limit (NMSL) was enacted to conserve fuel. Travel and speeds both decreased on roads where the

speed limit was lowered to 55 mph. These slower and more uniform speeds are judged to have saved between 3,000 and 5,000 lives in 1974. As fuel became plentiful again, travel increased and compliance with the 55 mph limit decreased markedly. In 1987, Congress allowed States to raise speed limits to 65 mph on rural Interstate highways. States that raised their limits generally saw increases of about 4 mph in average speeds and 85th percentile speeds and statistically significant increases in traffic fatalities on these roads. In 1995, Congress repealed the NMSL and returned full authority to set speed limits back to the States. Again, increased speed limits produced modest increases in both average and 85th percentile speeds and increases in traffic fatalities (TRB 1998, 6).

The few studies that have examined the effects of speed limit changes on lower-speed roads generally found little effect on driving speeds or crash rates when speed limits were raised to near the 85th percentile travel speed or lowered to near the 35th percentile speed, either on rural roads or on urban and suburban arterials (TRB 1998, 6). As the TRB report points out, "the findings suggest the difficulty of altering behavior [on these roads] merely by changing the [speed limit] sign"—that is, without publicized enforcement.

Enforcement

Enforcement relies on police officers observing speeding vehicles. Radar guns allow them to do this quickly and easily. But police can patrol only a tiny fraction of the nation's four million highway miles. When many drivers exceed speed limits every day, an occasional ticket has little effect. Even a police car by the side of the road isn't much help. On congested multilane roads, police cannot safety single out one car from the hundreds that speed by every minute. On roads where speed enforcement is practical, drivers have three standard reactions when they see a police car on the roadside: immediately slow down to the speed limit to attempt to avoid a ticket, flash their lights at oncoming traffic to warn them of the police car, and speed back up within a mile or two.

Automated enforcement with speed cameras has been used quite extensively in other countries but only rarely in America. As of October 2006, only 21 communities in 10 states and the District of Columbia used speed cameras, and some states explicitly prohibited their use (IIHS 2006a, 2006b). Speed cameras have proven their value in other countries. Pilkington and Kinra (2005) reviewed 14 high-quality studies of speed camera programs in Australia, Canada, New Zealand, Norway, and the United Kingdom and concluded that speed cameras reduce traffic crashes, injuries, and fatalities. Wilson et al. (2006) reached similar conclusions from a review of 26 studies. In the United States, though, speed cameras often are opposed by people who believe that they intrude on individual privacy or are an inappropriate use of law enforcement's authority.

Education

Education on speeding comes in two forms: tied to enforcement or stand-alone. Effective, high-visibility communications and outreach are critical if speed enforcement programs are to have much effect. Stand-alone programs urging drivers not to speed, using slogans such as "Speed Shatters Life," are unlikely to have any effect at all (Hedlund 2006, Sec. 3.4.1).

What's the real problem?

So: many if not most American drivers regularly speed, they know they speed, they don't take speed limits or speed limit enforcement seriously, and they generally have not supported automated speed enforcement. What's needed to change our speeding? It's not primarily an issue of how we build roads or vehicles, though our roads and vehicles can play an important role. Rather, it's an issue of how our society depicts and values speed and how society understands or does not understand the consequences of speed. In a word, it's the American *culture* of speed.

The American culture of speed

Speed on the highways is ingrained into many parts of contemporary American culture. It's apparent in the driving public's attitudes, beliefs, and behavior and is supported by our vehicles, our roads and speed limits, and our media. A full catalogue of this speed culture isn't necessary; a few examples in each area will suffice.

Public attitudes and behaviors are documented in NHTSA's 2002 national telephone survey of 4,010 drivers (Royal 2004). Among the findings:

- About 80% of all drivers said they exceeded the speed limit on all types of roads, from Interstate highways to neighborhood streets, within the past month, and about one-third reported that they were speeding on the day of the interview.
- One-third sometimes drive 10 mph faster than most other vehicles and more than half "often get impatient with slow drivers."
- On average, they think they can drive 7–8 mph over the posted speed limit, on any road, without being ticketed for speeding.
- They overwhelmingly agree with current speed limits but also overwhelmingly ignore them: for example, on city or town roads, 83% say that the speed limits are "about right," but 78% have exceeded the limit on roads of this type in the past month.
- Two-thirds felt that other speeding drivers pose a major threat to their personal safety.

As the report concludes, there's "a strong 'it's not me, it's the other guy who is a problem' mentality among many drivers."

Institutions support the public's speeding in many ways.

- The automobile industry builds cars that easily exceed the maximum posted speed limit on any road. Speedometers record speeds as high as 200 mph. As an example, a car parts website lists 32 speedometer models of which 22 record a top speed of 160 mph or greater and only one is less than 120 mph. The authors' three very pedestrian cars have top speedometer readings of 85, 110, and 120 (87 Caravan, 04 Corolla, and 01 Mazda, respectively).
- Cars today are smooth-riding, comfortable, and quiet. They don't shake and rattle, even on moderately rough roads. We drive with the windows closed and the "climate control system" on, winter or summer. So drivers don't feel that they are traveling fast.

- Car magazines promote speed. A typical quote: “Ascertaining a car's flat-out max isn't easy. Factors insignificant at 60, 80, or even 100 mph—the soundness of a car's hardware and the driver's software, aerodynamics, road surface, even local wildlife, for example—can become downright grave as you reach for 200.”
- Movies, television, video games, and other media regularly feature speeding cars. The cars sometimes crash, but injuries are rare.

The infrastructure—roads and speed limits—often encourages speeding. Wide, straight subdivision streets posted at 25 or 30 mph and lightly-traveled Interstate-quality divided highways posted at 55 reinforce driver perceptions that posted speed limits have little to do with proper driving speeds or safety. As discussed above, speed limits may not describe the maximum safe speed on a road segment and are widely ignored on roads of all types.

Federal actions to reduce speeding

The federal organizations responsible for safety on the roads—the Federal Highway Administration (FHWA) the National Highway Traffic Safety Administration (NHTSA), and the Federal Motor Carrier Safety Administration (FMCSA)—have activities to reduce speeding and speed-related crashes. They developed an inter-agency speed management strategic plan (U.S.DOT 2005) which promised to increase the priority of controlling speeding and listed activities to support engineering, enforcement, education, research, and cooperation with traffic safety partners. They joined with many partners to sponsor a National Forum on Speeding which produced a detailed action agenda (NHTSA 2005b). They have involved the states through activities including demonstrations of the impacts of setting and enforcing “rational speed limits” and speed management workshops. They have developed new communications messages such as “Obey the Signs or Pay the Fines.”

However, these activities to date have promised more than they have delivered. Speeding remains a poor third in priority order behind reducing drunk driving and increasing safety belt use. There have been no major FHWA or NHTSA initiatives to control speeding, nor has Congress given the federal agencies adequate resources to address the problem. One key number tells the story. The SAFETEA-LU highway reauthorization bill contains $29 million for national advertising to support drunk driving and safety belt use campaigns. It contains not one penny for media to support actions to reduce speeding. The federal response seems to mimic the national feeling that speeding is a traffic safety problem in the abstract, but it’s not at the top of the list.

How to change the speeding culture (and reduce speeding)

Changing cultural values is difficult, but far from impossible. Many cultural values change sooner or later. Americans have changed their values, norms, beliefs, and behaviors on several health and safety issues in recent years, sometimes for the better, sometimes not:

- Smoking was common a generation ago; now it’s marginalized, with most public areas smoke-free.

- Eating high-fat foods was common until public health studies about the epidemic of obesity caused a growing interest in healthier lifestyles. Food manufacturers contributed to the changed public attitudes because they found that marketing healthier foods was profitable.
- Recycling was limited to a cadre of concerned environmentalists until municipal governments found that it was in their economic interest to recycle. Recycling is now widely accepted.
- Twenty years ago, we had little concern about terrorists; today we routinely accept screening our baggage, taking off our shoes, and not bringing small amounts of liquid onto an airplane.

Similar changes have occurred on traffic safety issues:

- In 1955, safety belts didn't exist; in 1975, the national safety belt use rate was 10–15%; in 1990, it was about 50%; today it's 82%.
- Child safety seat use has increased even more dramatically, from zero in 1965 to well over 90% today.
- The proportion of drivers in fatal crashes who had been drinking dropped from 41% in 1982 to 24% in 2005.
- Twenty years ago, drivers didn't use cell phones; in 2006, 6% of all drivers on the road at any time were talking on a hand-held cell phone.

What's needed to change the speeding culture in the right direction? What's needed to make change happen quickly rather than just watching change happen slowly? Two things, acting together: effective campaigns to eliminate speeding in specific locations and situations where public support already exists and can be increased and vigorous leadership at all levels—local, state, and national—to make reducing speeding a high traffic safety priority. Leadership will bring resources; effective campaigns will raise public awareness of speeding and will increase public support for expanding speeding control more broadly. It's a simple strategy: start with tightly-focused targets; apply known methods to these targets to reduce speeds and crashes; publicize these successes and build on them to expand speeding control more broadly.

Local action: Where to start—speeding control targets

Targets can be chosen by road location and type or by driver actions.

Locations

Most people want to control speeding on the street where they live (a reflection of the "not in my back yard" attitude). Most cities, towns, and villages can identify streets where speeding is a problem and where enough citizens will support aggressive speeding control. Specific targets may include school zones; streets with many young children, elderly residents, or heavy pedestrian crossing traffic; high crash locations; or work zones. At these locations, there should be broad support for enforcing the speed limit with very little tolerance; for example, for issuing citations at 2 or 3 mph above the speed limit.

Drivers

Most people want to control the "extreme speeders" who go whizzing by them (it's the other guy who's a danger, not me). Defining these extreme speeders more precisely depends on a road segment's travel speeds, not on its posted speed limit. They may be the drivers in the top 5% of speeds, or those driving 10 mph faster than the average speed. A travel speed survey will provide the data to define extreme speeders in a way that wins broad public support for aggressive enforcement. These extreme speeders are aggressive drivers, and there's broad public support for aggressive enforcement to control them.

Both methods could be combined to target extreme speeders, appropriately defined, in specific locations: perhaps those exceeding the posted limit by 10 mph in school zones during school hours.

Targets to avoid

The right targets are those that make sense and have broad public support. Speed enforcement programs should avoid targets that are too broad or not well defined, such as all drivers exceeding the posted limit on a road, or all drivers who exceed some unannounced tolerance level above the speed limit. The public probably won't understand such a strategy; if they do, they probably won't believe it. Another target to avoid is a road where many drivers exceed the posted limit but where speeding hasn't produced crashes or injuries, unless there is very strong public support for reducing speeds on this road. For example, enforcement programs shouldn't concentrate resources on Interstates without a truly compelling reason. Many drivers on Interstates exceed the posted limit, but fewer than one-sixth of all speed-related fatalities nationwide occur on Interstates.

Local action: What to do—speeding control methods

The steps are straightforward.

- Choose targets carefully. Be sure the targets have public support. Consider public involvement in choosing the targets. Aggressive drivers may be the best initial target.
- Set and publicize clear, understandable goals. Make sure they focus on reducing speeding and crashes, not issuing speeding tickets or generating fine revenue.
- Choose speeding control and enforcement methods equally carefully. Be sure the methods will be able to realize the goals. Regular enforcement, special patrols, and automated enforcement each may have a role.
- Inform, educate, and publicize. Communications should be an integral part of the program design from the beginning, not an add-on at the end. The right message can be critical.
- Evaluate and publicize the results. Compare speeds and crashes before and after; compare target and non-target situations.
- Evaluate the program. What parts worked best? What could be improved?
- Expand to other areas. Build on the successes.

Local action: Automated enforcement

Automated enforcement using speed cameras probably will be an important component of a successful speed management program. No jurisdiction has enough police resources to cite speeders all the time on even the highest priority roads. Speed cameras can be there 24/7.

It's even more critical that speed camera enforcement programs follow the seven steps outlined above. Speed camera programs also must ensure that they are designed to be fair and open to the driving public, sensitive to concerns regarding privacy, and are led and managed by law enforcement, not by equipment vendors.

Jurisdictions where the public may not be ready to accept speed cameras may wish to use red light running cameras first. Red light runners are easy to identify and pose a clear danger to other drivers and pedestrians. Public support for red light cameras may well be stronger than for speed cameras. As of July 2006, red light cameras were used in more than 100 communities in 21 states and the District of Columbia. Several summary reviews conclude that they reduce overall injury crashes by as much as 25%, though they may increase low-severity rear-end crashes (Hedlund 2006, Sec. 3.2.2).

Two recent examples show how speed cameras can be an integral part of a targeted speed management program.

Arizona highway 101 forms a semicircle around Phoenix to the north. It's a multi-lane divided highway, carrying 127,000–170,000 vehicles daily, with a 65 mph speed limit. In free-flowing traffic outside of rush hours, the median speed in 2005 was 76 mph, with a significant number of vehicles exceeding 90 mph. The public was concerned: 76% supported a speeding control program using speed cameras. Speed cameras had been used in the Phoenix area for over 10 years, but not on a 65 mph multilane highway.

Six cameras, set to photograph vehicles traveling over 76 mph, were installed on a 7-mile segment of highway 101. The cameras began operation in February 2006, to heavy publicity. As of September 12, 2006, 72,300 speeders had been ticketed and the proportion of drivers exceeding 76 mph had dropped from 50% to 0.5%. Speeds also dropped on other sections of highway 101 that had no cameras. The speed cameras are widely supported by the public, not just in the Phoenix area but statewide. Revenue from speeding fines has more than paid operating costs over this period. An evaluation of the effects on crashes is scheduled to be completed early in 2007 (Hegarty 2006).

Illinois work zones are the only location in the state where speed cameras are authorized, and they can be used only when workers are present. The cameras are located on vans that can be moved from work zone to work zone. They are advertised heavily in advance of the work zone with large signs: "Speed Photo Enforced"—the goal is to slow down traffic in work zones, not to issue tickets. In 2006, these speed camera vans were used successfully in six work zones on Interstate-quality highways around the state, supplemented by officers at the roadside and on motorcycles (Tobias 2006).

Local action: Three key points

1. Work with law enforcement every step of the way, from planning to evaluation. In addition to being the ones on the front lines, who make or break any speed control program, police understand what will work and what won't.
2. Let the data drive the program. Go where the crashes are and where the public is concerned about speed.
3. Remember that speed enforcement in general and speed cameras in particular will succeed only if they are used to reduce crashes, not to raise revenue.

State action: Speed limits, enforcement, communications, sanctions, and data

These state responsibilities support and complement local speed control initiatives.

Speed limits

States establish the general speed limits that apply to all roads in a class within the state. States also control the efforts of communities to establish speed zones to modify these general speed limits. This control provides some consistency in speed zone practices throughout the state. But it also may raise substantial obstacles to speed zone proposals, even when they are broadly supported. States should move beyond a rigid application of the 85th percentile rule in setting speed limits and establishing speed zones. States may wish to consider establishing and enforcing variable speed limits, which can adapt to weather and traffic flow conditions, on key high-volume road segments.

Speed enforcement and communications

States are responsible for speed enforcement on some roads and share responsibility with communities on other roads. States and communities should work cooperatively to develop and implement consistent speeding control targets and enforcement strategies. All states should permit automated enforcement using speed cameras and should encourage and support communities in using automated enforcement in appropriate situations. Effective communications at both state and community levels must set the stage by raising public awareness of the costs of speeding and by vigorously publicizing speeding enforcement activities.

Sanctions

States establish the penalties for speeding violations. They usually include fines and driver's license points, with additional penalties when license point totals become large. Many states increase the penalties for speeding in some situations, such as school or work zones. Many states also increase the penalties for substantially exceeding the speed limit. States may wish to review their speeding penalties and consider how effective they are in deterring speeders. Perhaps stiffer or more creative penalties would convince speeders to slow down.

Data

Data are needed to document the true role of speeding on the highways and in crashes. States need good data to monitor travel speeds, document the true role of speeding in crashes, and identify speeding control targets. Having consistent data statewide will help states develop consistent speeding control programs and communications.

National leadership: Federal roles

States and communities can control speeding only in their jurisdictions. It's hard to change the national speeding culture just through local action, especially since all states and communities can't be expected to embrace speeding control with the same enthusiasm. The U.S. Department of Transportation and its agencies responsible for controlling speed—FHWA, NHTSA, and FMCSA—must provide aggressive national leadership to help states and communities by making speeding control a national priority and by providing funding, data, research, and communications.

National priority

Speeding control must be as important on the national traffic safety agenda as reducing drunk driving or increasing safety belt use. And it should be: speeding control can prevent more crashes and injuries. Speeding control will be a national priority when it's emphasized in speeches as frequently and vigorously and when it receives as much staff support and program funds as drunk driving or belt use. This national priority should include active and positive support for automated enforcement using speed cameras in selected locations, which is part of the Department of Transportation's plan (U.S.DOT 2005, Objective 4, Strategy 3)

Program funds

Congress should support state speeding enforcement efforts with federal funding appropriate to speeding's national traffic safety priority and also should fund a national speeding communications campaign similar to the national drunk driving and safety belt use campaigns. NHTSA and FHWA should support speeding control to the extent possible given competing highway safety priorities. It's not too early to begin thinking about the next highway reauthorization bill that will replace SAFETEA-LU. It should include additional funding for both federal and state activities to control speeding.

Communications

Cultural change can be led by effective communications with consistent and persuasive messages. The federal agencies should develop a true national speed control campaign, from marketing research through message development and testing to production, placement, and evaluation. State and communities shouldn't need to do all this on their own and may lack the resources to do it well. Good communications are critical to establishing speeding control as a national priority.

Data

While states have the lead in collecting data on travel speeds and speed-related crashes, federal agencies should provide guidance and assistance and should aggregate and report these data to

document the effects of speeding nationwide. Travel speed data have not been collected and reported consistently since the repeal of the National Maximum Speed Limit. FHWA should take the lead in documenting where travel speed data are collected, developing a system to aggregate and report these data, determining what additional travel speed data are needed, and helping states and communities acquire these data. Police accident reports do not contain accurate data on vehicle pre-crash travel speeds, only estimates that the police obtain from witness reports, crash reconstructions, and other sources. NHTSA should take the lead in developing practical methods to improve speed estimates for vehicles in crashes.

Research

Research is needed in several key areas, including:

- Develop criteria for setting appropriate speed limits that go beyond automatic application of the 85th percentile rule in every situation.
- Investigate methods for designing "self-enforcing roads" in which the road design itself promotes safe speeds.
- Study engineering methods for achieving appropriate speeds on curves.
- Evaluate the effects of automated speed enforcement in different settings.
- Study and evaluate how to establish and enforce variable speed limits and the effects of variable speed limits on speeds, crashes, and casualties.

Many of these activities are on the Department of Transportation's long-range plan (U.S.DOT 2005). They should be given high priority.

The federal agencies also can lead and encourage private sector companies and organizations to play their part in controlling speed and helping change the culture of speeding.

National leadership: Private sector roles

Portions of the private sector support or even encourage the current culture of speed. They could, and should, work to change this culture in both small and large ways. A few examples:

- Automobile manufacturers could downplay speed in their promotions and ads. They could build cars with a reasonable maximum speed and a reasonable speedometer limit rather than using an engine and speedometer that can exceed more than twice the maximum posted speed limit in any state.
- Car magazines could restrict high speed coverage and promotion to the place where they belong: the racetrack.
- Television and movies could show the real consequences of speeding in wrecked cars and shattered bodies and lives.
- Insurance companies could provide incentives for drivers who are never cited for speeding.
- Trucking companies could reward drivers for not speeding and should consider speed governors for some commercial vehicles.

- University civil engineering courses could emphasize speed management techniques such design principles for self-enforcing roads and rational methods for setting speed limits.

In the long run: Design and build roads with self-enforcing speed limits

Roadway design and engineering are the fundamental determinants of travel speeds. If a roadway is designed for high speeds—a multi-lane, divided, limited-access highway with few hills or curves—then it's almost impossible for enforcement and education measures to control speeds. On the other hand, speeds on a narrow, two-lane, winding village street will be low. Both short-term and long-term roadway design and engineering strategies can be used to manage travel speeds, as is done in some European countries (NHTSA 2005b).

Short-term engineering measures can include:

- Speed humps or roundabouts on local streets
- Transitional signing at speed zone boundaries
- Pavement markings and roadside elements to provide visual cues that encourage slower speeds
- Better signal timing, to convince drivers that they will keep moving if they drive at or under the speed limit, while speeding only gets them to the next red light faster (a win-win design, since safe speeds equate to faster travel times); perhaps changing signal timing on weekends and evenings.

Longer-term measures should be based on designing roadways with safe speeds in mind from the outset, rather than attempting to manage speeds once the roadway is built.

Summary and recommendations

The speeding culture is so pervasive that it won't be changed easily and probably won't be changed quickly. But it can be changed, it should be changed, and with effective community campaigns and strong leadership at all levels it will be changed. To get started:

Federal agencies should:

- Make speeding control a national priority. Use national leadership to inform public, private sector, and policymakers of the costs of speeding and the need for speeding control. Request funding, appropriate to the role of speeding in traffic injuries and fatalities, in the next highway reauthorization bill.
- Encourage states and communities to use automated enforcement as appropriate.
- Develop effective communications on speeding control for states and communities.
- Encourage private sector activities to change the speeding culture.
- Give high priority to the data and research needed to support speeding control.

States and communities should:

- Implement speeding control programs in selected target areas, using automated enforcement as appropriate; aggressive drivers may be the best initial target.
- Build these programs on good data documenting the role of speeding on the highways and in crashes.
- Evaluate and publicize the results and expand to other targets.

Private sector companies and organizations should:

- Evaluate how their activities and communications may support or even encourage the speeding culture.
- Find opportunities to use their activities and communications to discourage speeding.

Speeding can be controlled and reduced. Speeding reductions will bring real results: a 5% reduction in speeds, say from 40 mph to 38 mph on a local street with a speeding problem, will reduce crashes by about 10%, serious injury crashes by about 14%, and fatal crashes by about 19%. With strong leadership and effective community campaigns, these speeding reductions are possible. Without them we can only expect speeding crashes, injuries, and fatalities to increase as the speeding culture continues its hold on America's drivers and roads.

References

Aarts, L. and I. van Schagen. 2006. Driving speed and the risk of road crashes: A review. *Accident Analysis and Prevention* 38: 215–24.

Elvik, R. 2005. Speed and road safety: synthesis of evidence from evaluation studies. *Transportation Research Record* 1908:59-69.

GHSA. 2005. *Survey of the states: Speeding.* Washington, DC: Governors Highway Safety Association.

Hedlund, J. 2006. Countermeasures that work. *Chapter 3: Aggressive Driving and Speeding*. DOT HS 809 980. Washington DC: National Highway Traffic Safety Administration.

Hegarty, M. 2006. *Photo enforcement: Scottsdale pilot project, Loop 101.* Presentation at 2006 GHSA Annual Meeting.

IIHS. 2006a. *Automated enforcement laws*. Arlington, VA: Insurance Institute for Highway Safety.

———. 2006b. *Communities with speed cameras as of October 2006*. Arlington, VA: Insurance Institute for Highway Safety.

NHTSA. 2005a. *Traffic safety facts 2004*. DOT HS 809 919. Washington, DC: National Highway Traffic Safety Administration.

———. 2005b. *National forum on speeding: Strategies for reducing speed-related fatalities and injuries*. DOT HS 809 963. Washington, DC: National Highway Traffic Safety Administration.

———. 2006. *Traffic safety facts: Speeding*. DOT HS 810 629. Washington DC: National Highway Traffic Safety Administration.

Pilkington, P. and S. Kinra. 2005. Effectiveness of speed cameras in preventing road traffic collisions and related casualties: systematic review. *British Medical Journal* 330:331–4.

Royal, D. 2004. *National survey of speeding and unsafe driving attitudes and behavior: 2002*. DOT HS 809 730. Washington DC: National Highway Traffic Safety Administration.

Tobias, P. 2006. *Work zone photo radar speed enforcement.* Presentation at 2006 GHSA Annual Meeting.

TRB. 1998. *Managing speed: Review of current practice for setting and enforcing speed limits.* Transportation Research Board Special Report 254. Washington DC: National Academy Press.

U.S. DOT. 2005. *Speed management strategic initiative*. Washington, DC: U.S. Department of Transportation Speed Management Team (Federal Highway Administration, Federal Motor Carrier Safety Administration, and National Highway Traffic Safety Administration).

Wilson, C., C. Willis, J. K. Hendrikz, and N. Bellamy. 2006. Speed enforcement detection devices for preventing road traffic injuries. *The Cochrane Database of Systematic Reviews 2006(3)*.

Biographical statements

Barbara Harsha is Executive Director of the Governors Highway Safety Association (GHSA) —the non-profit organization that represents state highway safety offices. She is responsible for directing the organization's Washington office, providing services to the membership, representing the organization in a variety of capacities including with Congress and the federal agencies, and administering federal grants. Prior to joining GHSA in 1988, Barbara worked for ten years for the National League of Cities, one of the major public interest groups in Washington. She served as a senior policy analyst for the League's transportation committee and later as the Director of Policy Development for the League. Before coming to Washington, she was a transportation planner with the Southern California Association of Governments in Los Angeles. She has a masters degree in urban planning from the University of Southern California and a BA from Washington University in St. Louis.

James Hedlund is a consultant on traffic safety research, management, and policy issues under the nom de plume of Highway Safety North. He retired in 1997 as Associate Administrator for Traffic Safety Programs of the National Highway Traffic Safety Administration (NHTSA). In previous NHTSA positions, he directed the Office of Alcohol and State Programs, Office of Driver and Pedestrian Research, and Mathematical Analysis Division. He has written over 40 research reports, conference summaries, research syntheses, and guides for traffic safety practitioners on a variety of behavioral traffic safety subjects. He holds a PhD in mathematics from the University of Michigan. Before joining NHTSA, he taught mathematics and statistics at the University of Massachusetts (Amherst) and at Smith College.