

Spotlight on
Highway Safety



Speeding Away from Zero:

Rethinking a Forgotten Traffic Safety Challenge



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SUMMARY

Speeding-related fatalities account for a considerable proportion of U.S. road trauma, historically comprising approximately one-third of total fatalities. Nationally, there were 9,717 speeding-related fatalities in 2017 – about 26% of the total, though the proportion of speeding crashes differs dramatically across the states. Speeding-related fatalities are associated with a number of factors, including driver characteristics, risky behaviors such as alcohol-impaired driving, marijuana-impaired driving or failure to buckle up, and environmental factors such as the built environment and driving conditions. Speeding-related crashes also have unique impacts for vulnerable road users, such as pedestrians, bicyclists, motorcyclists and roadside workers. Overall progress on the issue of speeding has been limited at best.

Speeding remains a publicly-accepted driving behavior that is reinforced among motorists, policymakers and transportation stakeholders. National surveys of U.S. drivers have found that although drivers identify speeding as risky, drivers nonetheless continue to speed. Drivers have a minimal perception of risk of either getting a ticket, causing a crash, or violating social norms.

Federal, state and local policymakers are approaching speed management in different ways, but these approaches often reflect the current cultural attitude towards speeding. Some states are increasing certain speed limits, while others are granting more local discretion to set speeds according to local needs. The collection and aggregation of accurate data about speeding-related crashes remains a challenge. Speed management initiatives often face political roadblocks and a shortage of resources.

Fortunately, states and municipalities also have available guidance on a range of infrastructure-based approaches that can prevent or mitigate speeding. Many states and communities are exploring more integrated traffic safety programs that aim to coordinate interdisciplinary speed management efforts. A number of technological approaches to speed management are available, but widespread deployment among passenger vehicles may be a long-term process.

The traffic safety community must take a number of key action steps to better address speeding. The federal government should better prioritize speeding as a leading traffic safety issue and create new federal programs to address it. States and municipalities should consider task forces or advisory committees to better coordinate speed management, promote crash report and crash database improvements, and explore the use of integrated speed management programs.

States and local governments should increase speeding enforcement, including thoughtful deployment of automated speed enforcement, and train law enforcement officers to better document speeding-related crashes. These entities should set appropriate speed limits and continue to deploy roadway infrastructure to better control speed.

Finally, while many states and communities are conducting media and educational outreach campaigns about the dangers of speeding, the traffic safety community should consider developing a more innovative approach to changing social norms that gives voice to speeding crash victims and creates a new wrong-doing traffic safety archetype: the speeding driver.

To create this report, the Governors Highway Safety Association (GHSA) requested speeding-related data from the states to gather subject matter expert knowledge on obstacles, successes and other factors related to speeding. Speeding-related fatality counts were obtained from the National Highway Traffic Safety Administration (NHTSA) Fatality Analysis Reporting System (FARS) database and NHTSA Traffic Safety Research reports.

INTRODUCTION

This report presents speeding-related fatality trends according to data collected by the National Highway Traffic Safety Administration Fatality Analysis Reporting System, documents and summarizes information collected from the states, and reviews policy, programmatic, and cultural trends related to speeding.

The Safety Risk Presented by Higher Speeds is Undisputed

According to the International Traffic Safety Data and Analysis Group (IRTAD), speed has a direct influence on crash occurrence and severity. With higher driving speeds, the number of crashes and the crash severity increase disproportionately. With lower speeds, the number of crashes and the crash severity decrease (IRTAD, 2018). Fatal single vehicle crashes are typically related to speed and/or distraction (Liu and Chen, 2009). Several research reports, have identified higher speeds as a significant factor in determining injury severity (Hu et. al, 2016; NTSB, 2017). The Insurance Institute for Highway Safety reports that speed influences the risk of crashes and crash injuries in three ways:

- The distance a vehicle travels from the time a driver detects an emergency to the time the driver reacts is increased.
- The distance needed to stop a vehicle once the driver starts to brake is increased.
- The exponential increase in crash energy. For example, when impact speed increases from 40 to 60 mph (a 50% increase), the energy increases by 125% (IIHS, 2018b).

The force involved in a crash is directly related to the speed at the time of a crash. In a high-speed crash, a passenger vehicle is subjected to forces where the structure of the vehicle cannot withstand the force of the crash and maintain survival space within the occupant compartment of the vehicle. In addition, in high speed crashes, restraint systems such as airbags and safety belts are incapable of minimizing these higher levels of force (IIHS, 2018b).

The Current Climate of Speeding in the United States

In today's life, a high degree of mobility and the ability to travel quickly by air, rail or road seems to have become an everyday expectation of modern society. NHTSA studies have shown that most traffic exceeds posted speed limits, and this culture is mutually reinforced between drivers, policymakers and many transportation stakeholders. While speeding may seem like a new challenge, we are in fact managing the legacy of a decades-long culture oriented towards minimizing travel times. Many existing roads do not reflect the latest speeding-related guidelines, and some roads even predate any explicit consideration of vehicle speeds (FHWA, 2009). Added to this are current cultural obsessions with fast cars, horsepower, racing, and a clear, ongoing interest and willingness to move fast.

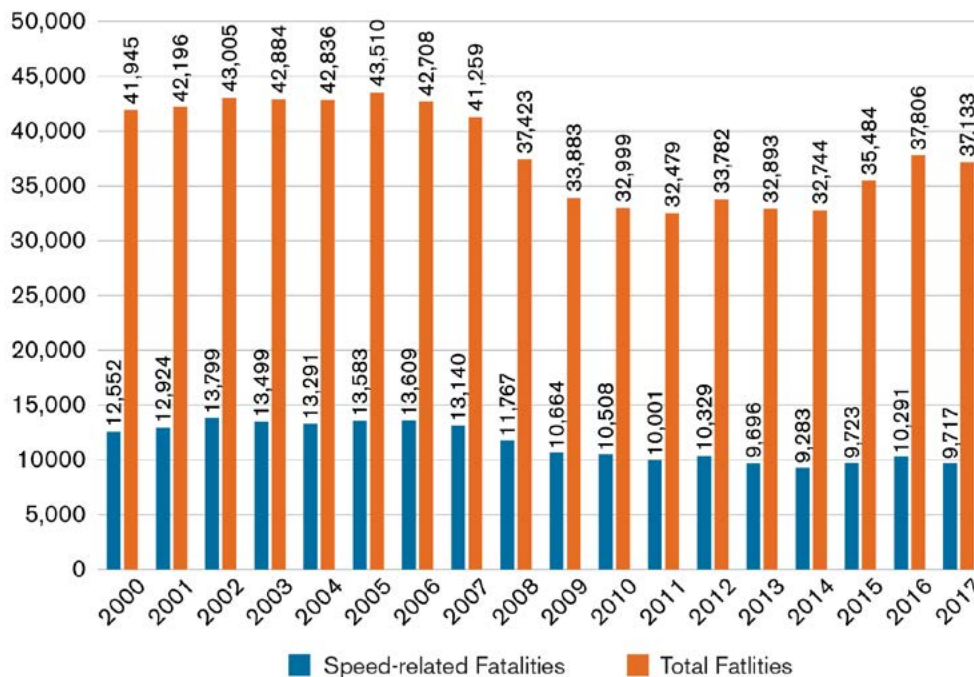
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While speed is often used as a measure of mobility, high speeds also impose a clear safety toll (FHWA 2009). According to NHTSA, there were 9,717 speeding-related fatalities on U.S. roadways in 2017, and speeding-related fatalities made up 26.2% of the nation's total fatalities (NCSA, 2018d). **This safety toll is persistent as excessive speed has long accounted for a considerable proportion of U.S. road trauma.** Speeding-related fatalities as a percent of total motor vehicle fatalities vacillated between 32% and 31% from 2001 to 2012 (NCSA, 2018d). The National Transportation Safety Board (NTSB) reported that speeding is one of the most prevalent risky driving behaviors on U.S. roadways and a common factor in motor vehicle crashes, and that speeding has been a causal or contributing factor in 49 major NTSB highway accident investigations since 1967 (NTSB, 2017).

Both speeding-related fatalities and total motor vehicle fatalities trended downward from 2005 to 2011 (Figure 1). These declining trends may be attributed to the implementation of safety improvements including air bags, increased seat belt use, and other passenger vehicle safety features. However, the declining trend in total motor vehicle fatalities reversed in 2015.

Figure 1. Speeding-Related vs. Total Fatalities 2000-2017



Source: FARS

In 2010, speeding-related fatalities as a percentage of total motor vehicle fatalities began declining as total motor vehicle fatalities stayed consistent until 2015 then started trending upward. During this time there was a 6% decrease in speeding-related fatalities, from 32% in 2010 to 26% in 2017.

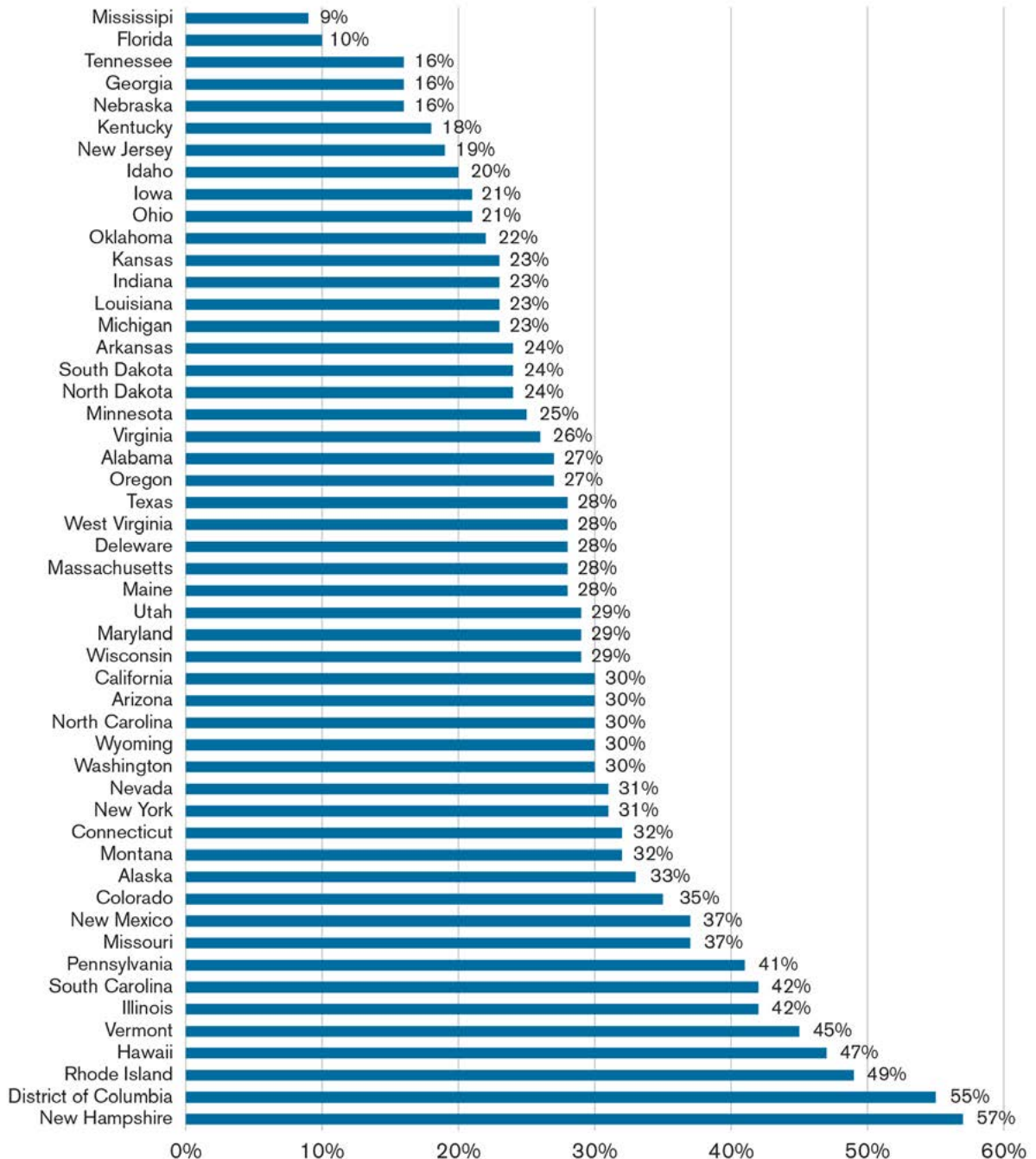
Speeding-related deaths as a percent of the total motor vehicle deaths were calculated for each state for 2017. 2017 FARS data was queried to calculate the speeding-related deaths as a percent of total motor vehicle deaths for 2017 (Figure 2). New Hampshire and Washington, D.C. had the top two percentages for both years, with more than half of motor vehicle deaths classified as speeding-related.

This state-by-state variation, ranging from 57% to 9% of total motor vehicle deaths, is striking. By comparison, the percentage of alcohol-impaired driving fatalities in 2017 ranges only from 51% to 19%

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(NCSA, 2018a). These findings suggest that many factors could be impacting speeding practices, including different travel trends, roadway environments, laws and programs. As discussed below, there are also variations in the data collection practices that likely result in underreporting of speeding-related crashes. Most importantly, these differences suggest that there may be promising best practices that can be applied widely.

**Figure 2. Speeding-related Deaths as a Percent of Total Motor Vehicle Deaths in 2017
Sorted by Percent**



State Survey on Speeding Trend Factors

In August 2018, GHSA surveyed states to determine potential trends regarding speeding-related fatalities and explanations for these trends within the states. Responses were collected from all 50 states and the District of Columbia. Responses to questions are based on the respondents' experience and content knowledge as subject matter experts for the states, not scientific analyses.

The states reported a number of factors that may play a role in increases in speeding-related fatalities (in no particular order):

- Increased speed limits;
- Limited law enforcement resources;
- Lack of a federal traffic safety grant program focused exclusively on speed enforcement;
- Overall increases in motor vehicle crashes and vehicle miles traveled;
- Greater distances to and from work or recreational destinations, therefore increasing the number of speeding incidents;
- Increased congestion on major roadways due to volume, causing drivers to try to make up time for the perceived time spent in traffic;
- Updated crash reports and data systems that now more effectively report speeding-related crashes and fatalities;
- Inclement weather such as ice and snow in states with colder winter months;
- Population increases;
- Higher incidences of distraction among drivers; and
- Recreational marijuana legalization.

The states also reported factors that could decrease speeding-related fatalities, including:

- Overall declines in total motor vehicles deaths;
- High visibility enforcement (HVE) of occupant protection laws and seat belt media campaigns;
- Increased engineering efforts incorporating traffic calming features; and
- Reductions in teen driver registrations and licenses issued during the past few years, reducing exposure for the younger age categories.

The role of many of these observed factors in speeding-related crashes is supported by crash data and research, as described below.

SPEEDING COMBINED WITH OTHER FACTORS AND CRASH CHARACTERISTICS

Speeding-related fatalities are associated with several other factors, including driver characteristics, risky behaviors such as alcohol-impaired driving, marijuana-impaired driving or failure to buckle up, and environmental factors such as the built environment or driving conditions. Speeding-related crashes also have unique impacts for vulnerable road users, such as pedestrians, bicyclists, motorcyclists, and roadside workers.

Driver Factors

Age and Sex

Certain groups of road users are over-represented in speeding-related offenses and speeding-related fatalities. Although speeding is a problem among all driver age groups, young drivers are much more likely to cause crashes and commit speeding violations than those of drivers of other ages. For example, younger drivers, particularly younger men, are at a higher risk of committing a speeding offense and of being repeat speeding offenders, and males are generally overrepresented in speeding-related fatality statistics (Figure 3) (CARRS, 2013). Historically, young male drivers were most likely to be speeding at the time of a fatal crash (NCSA, 2018d).

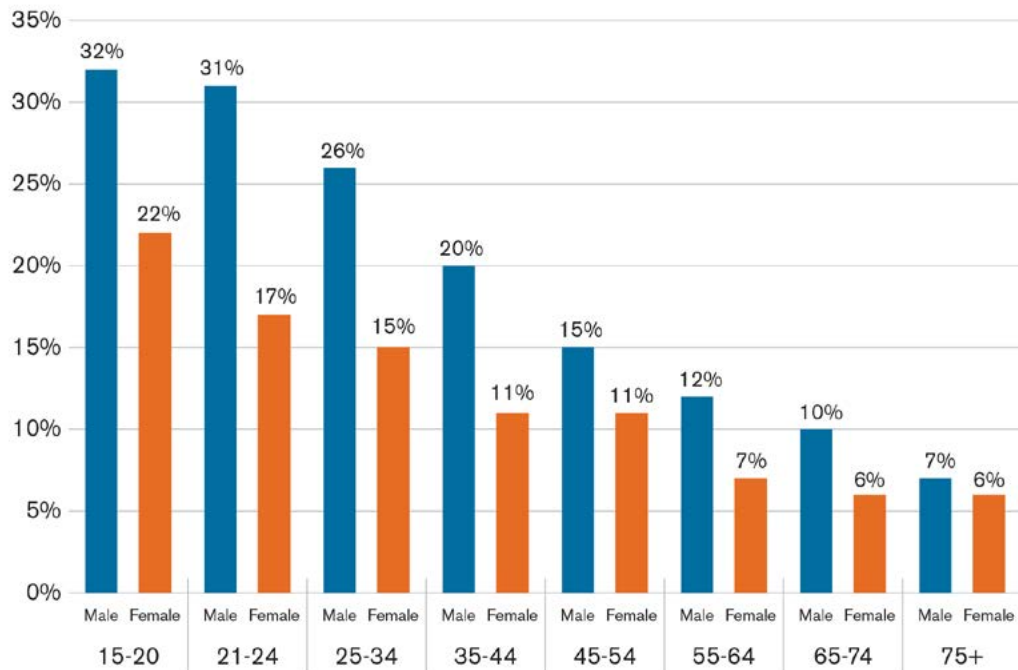
A 2006 study of drivers on limited access highways observed drivers exceeding posted limits by more than 14 mph to more often be male and more often judged to be younger than 30. An observational study conducted on roads with speed limits ranging from 40-55 mph compared drivers traveling at least 15 mph above posted speed limits with drivers of adjacent vehicles traveling no more than five mph above the speed limit. Speeders were younger than drivers in the comparison group and had more violations and crashes on their driving records (Williams, 2006).

A study conducted by the California Department of Motor Vehicles found that the rate of speeding violations per mile traveled was at least three times as high for drivers 16-19 years old as it was for drivers 30 and older. In a 2011 national telephone survey, the percentage of drivers who reported having at least one speeding-related crash during the past five years was higher for the youngest drivers, those 16-20 years old, than for any other age group, even though the youngest drivers may not have been driving for all of the past five years. This survey also found that drivers who reported consistently exceeding speed limits by 15 mph on highways or by 10 mph on residential streets tended to be younger than non-speeders (Schroeder, 2013).

In GHSA's survey of the states, respondents echoed that most speeding-related crashes involved younger males. However, some states reported that 2017 was the first time they noticed increases in speeding-related crashes involving older adult males. Figure 3 represents males versus females killed in speeding-related crashes as a percentage of overall crash deaths for each age category in 2016, showing involvement in these crashes decreased with age. Males were involved at a higher percentage for each age group.

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Figure 3. Males vs. Females Killed in Speeding-Related Crashes as a Percentage of Overall Crash Deaths, Sorted by Age Group, 2016



Source: FARS 2016 Annual Report File (ARF)

NHTSA released a study in 2016 identifying four different categories of speeding drivers: “Deliberate Speeders,” “Typical Speeders,” “Situational Speeders,” and “Unintentional Speeders” (NHTSA, 2016).

- “Deliberate Speeders” were found to engage in more aggressive and deliberate speeding events and engage in risky driving behaviors more often than driver types. “Deliberate Speeders” also had the most favorable attitude toward speeding. Young males were more prevalent in this category.
- “Typical Speeders” comprise the largest number of drivers with an even distribution across all driver demographics. These drivers engage in casual speeding most often.
- “Situational Speeders” engage in minimal amounts of aggressive speeding and cruising speeding and only engaged in speeding events slightly more than “Unintentional Speeders,” however “Situational Speeders” did not share the same favorable views regarding not speeding as unintentional speeders.
- “Unintentional Speeders” generally engage in incidental and casual speeding. These speeders have attitudes and beliefs that are most favorable toward not speeding. Both “Situational” and “Unintentional Speeders” are mostly comprised of older drivers (NHTSA, 2016).

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Alcohol-Impaired Driving

Alcohol impairment – having a blood alcohol concentration (BAC) of .08 grams per deciliter (g/dL) or higher – has been reported to be more common among drivers involved in speeding-related fatalities than drivers who were not speeding. In 2016, 37% of all speeding drivers in fatal crashes had a BAC of .08 or higher, compared to 15% of non-speeding drivers involved in fatal crashes (NCSA, 2018d).

Historically, alcohol impairment among speeding drivers in fatal crashes has been prevalent among adult drivers age 21 or older. These percentages have changed little over the past ten years, ranging from 37% to 43%. Alcohol impairment was involved in only 15% to 17% of non-speeding-related fatalities from 2006-2016.

Alcohol impairment is somewhat less common among speeding drivers younger than 21, ranging from 28% to 30% from 2006 to 2013 before declining to 22% in 2016. These percentages follow the trends of 21 and over drivers, showing consistency from 2006 to 2013. Notably, there is a consistent decline of 2% each year, from 28% in 2013 to 22% in 2016. Alcohol impairment was a factor in only 12% to 14% of non-speeding fatalities involving drivers younger than 21 during the same time frame.

In 2016, 25% of speeding drivers involved in fatal crashes had BACs of .15 or higher, compared to 10% of non-speeding drivers involved in fatal crashes. Speeding drivers involved in fatal crashes were more likely to be drinking, and drinking more, than those drivers who were not speeding (NCSA, 2018d).

Marijuana-Impaired Driving

The effect of marijuana-impaired driving on speeding behavior is unclear, and research has yielded mixed findings.

A recent study conducted by the National Institute on Drug Abuse (NIDA), NHTSA and the Office of National Drug Control Policy, using the National Advanced Driving Simulator at the University of Iowa, showed that marijuana had no effect on the variability of speed. In fact, in the combined alcohol and marijuana condition, it appeared marijuana mitigated some of the effects found with alcohol by reducing the time spent above the speed limit (Compton, 2017). However, this was a very controlled study using a simulator.

Several other recent studies reported outcomes where drug-impairment by marijuana increased the risk of speeding. A study released in 2018 conducted by the Colorado Department of Public Safety Division of Criminal Justice Office of Research and Statistics showed that common charges associated with marijuana included speeding. In this study, a total of 5,773 final non-DUI offense charges were associated with the presence of Delta-9 THC – the main psychoactive ingredient in cannabis. Of these non-DUI offense charges, 402 were associated with speeding and more than half of those speeding offenders tested positive for only Delta-9 THC. These findings are contrary to anecdotes that cannabis users drive slower to compensate for deficits in driving-related skills (Reed, 2018).

The relationship between alcohol, drugs, and speeding may be even more complex as data show the use of a wide range of potentially impairing substances and a significant amount of poly-drug use among drivers – the use of two or more drugs, or alcohol and at least one drug (Hedlund, 2018a). Stimulants and other drugs, including for instance amphetamines, or “speed,” may encourage faster driving (CCSA, 2015).

Restraint Use

According to NHTSA, over the past 10 years, approximately half of speeding drivers involved in fatal crashes were unrestrained, while approximately one-quarter of non-speeding drivers involved in fatal crashes were unrestrained. In 2016, restraint use remained fairly consistent, with 50% of passenger vehicle drivers involved in fatal crashes who were speeding found to be unrestrained, compared to approximately one-fifth (21%) of non-speeding drivers. Speeding drivers involved in fatal crashes are less likely to be restrained (NCSA, 2018d). Seat belts can save lives when worn properly. However, at high speeds, the force of a crash can be such that even seat belts cannot prevent serious injuries or even fatalities.

Cross-cutting Behavioral Risk

Researchers have uncovered evidence that drivers who speed also likely engage in a range of risky behaviors. NHTSA analyzed the previous driving records of drivers involved in fatal crashes, noting that fatally-injured speeding drivers are more likely to have a previously recorded crash, license suspension or revocation, and/or speeding or DWI conviction than non-speeding drivers (NCSA, 2018d). As noted above, alcohol impairment and lack of restraint were found to be more common among speeding drivers in fatal crashes than those drivers who were not speeding or restrained.

Further, speeding and aggressive driving are often correlated risky driving behaviors. Aggressive driving is defined by most states as a single instance or collection of unsafe driving behaviors, including speeding, failure to obey a traffic control device, passing on the right out of regular lanes of traffic, unsafe lane change, following too closely, failure to yield right of way, or presenting an immediate hazard to another person or vehicle. In a 2017 national survey by the AAA Foundation for Traffic Safety (AAAFTS), two in three drivers (68.1%) perceived that aggressive driving is a much bigger or somewhat bigger problem today than it was three years ago, and 91.5% of all drivers felt people driving aggressively pose a threat to their personal safety (AAAFTS, 2018).

The more consistent management of speed may have even broader traffic safety benefits by facilitating individual interventions that would reach drivers likely to introduce a spectrum of different risks to the road.

Environmental Factors

Roadway Factors

In 2016, when roadway function class was known, 86% of speeding-related fatalities occurred on non-interstate roadways (NCSA, 2018d). Two speeding conditions are usually considered when assessing the road factors contributing to speeding-related crashes: exceeding the posted speed limit and driving too fast for conditions. Driving too fast for conditions is usually cited during times of inclement weather such as rain, snow or icy conditions. However, curves in the roadway and roadways with other contextual features may also fall into this category. In fatal crashes, exceeding the posted speed limit is more often a factor than driving too fast for conditions. However, the reverse is seen in speeding-related injury and property-damage-only crashes (Liu and Chen, 2009).

Drivers who speed also likely engage in a range of risky behaviors.

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Inclement weather seems to present elevated risks. In 2016, speeding was a factor for 17% of the drivers involved in fatal crashes on dry roads, 21% of those on wet roads, 32% when there was snow or slush on the roads, and 44% of drivers involved in fatal crashes that occurred on roads with ice or frost (NCSA, 2018d).

Curved Roadways

Curved sections of roadways commonly contribute to speeding-related crashes. Horizontal curves are changes in the alignment or direction of the road, as opposed to vertical curves, which are a change in the slope. In 2008, more than 80% of fatal crashes were roadway departures with more than 27% of total fatal crashes occurring at horizontal curves. Rural roads contain horizontal curves more often than non-rural roads. A higher percentage of fatal curve-related crashes occur on rural roads (FHWA, 2010).

A driver's perception of speed going into a curved roadway has a strong correlation to the probability of a crash caused by speeding (Yotsutsuji, 2017). A study conducted in 2016 to identify the speeding-crash rate index caused by speeding on a curved roadway found there was a great degree of difference among crash probabilities depending upon the discrepancy between a driver's perceived speed and the maximum safe speed on curved roadways. Therefore, a driver's accuracy in judgement regarding negotiating speeds through curved sections of roadways is key to traveling safely through these types of roadway sections. However, if a driver is distracted or impaired, this may affect their perception of what would be a safe or adequate speed. Road marking may aid in reducing these types of crashes. This study found that road surface markings just before curves were effective in reducing speeding crashes in this situation (Yotsutsuji, 2017).

Urban and Rural Roadways

Fatal speeding-related crashes occur most frequently on non-interstate roadways (Figure 4). This remains true for both urban and rural roadways. Total fatality rates on rural roads are typically more than twice that of urban roads (FHWA, 2018). Specifically, non-interstate rural roads are reported to have the highest incidence of speeding-related fatalities (Figure 5) (FHWA, 2018). This could be a result of a number of factors that either introduce risks, encourage speeding, or lower drivers' risk perceptions:

- The higher number of horizontally curved roadways as mentioned above;
- Higher speed limits found on rural interstate roadways (see [GHSA Speed Limits by State](#)) (GHSA, 2018a);
- Longer distances to travel with less traffic;
- Sparser traffic enforcement efforts;
- Fewer traffic calming features; and
- Fewer non-motorized road users.

In 2016, there were 5,013 speeding-related fatalities on all rural roadways (both interstate and non-interstate) compared to 4,660 speeding-related fatalities on urban roadways (both interstate and non-interstate), a difference of 353 fatalities, or 7%. In 2015, there were 4,731 speeding-related fatalities on all rural roadways (both interstate and non-interstate) compared to 4,138 speeding-related fatalities on urban roadways (both interstate and non-interstate), a difference of 593 fatalities, or 13%.

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Figure 4 Percentage of Speeding Drivers in Fatal Crashes: Interstate v. Non-Interstate, 2012-2016

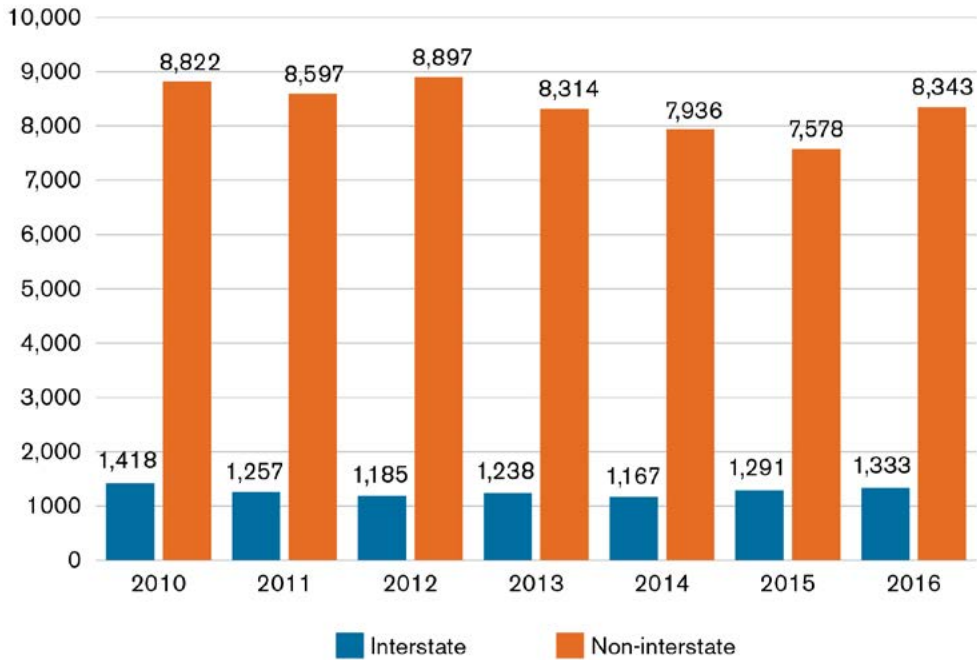
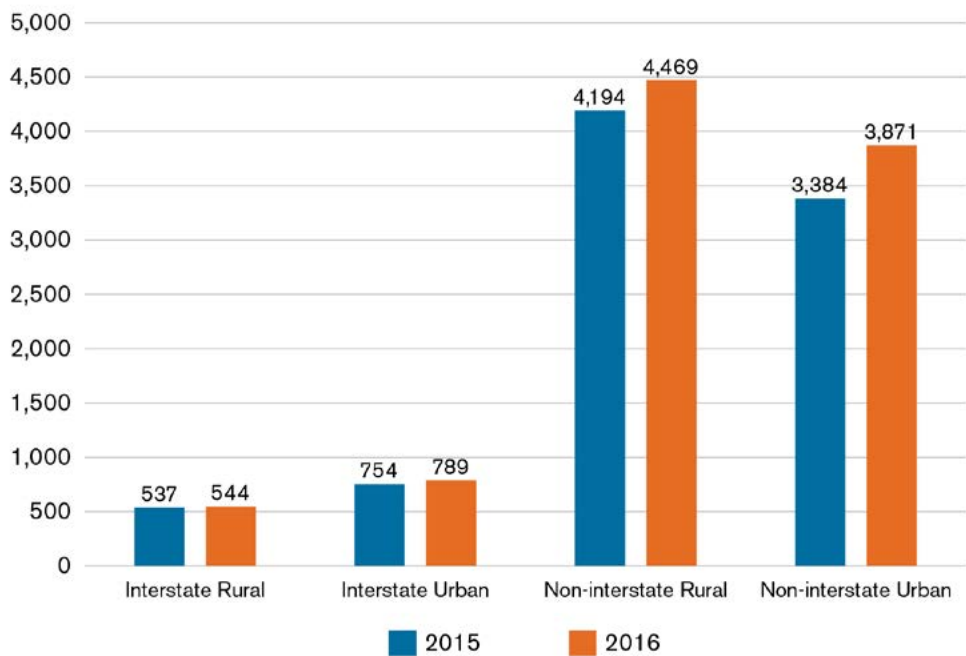


Figure 5. Speeding-Related Fatalities on Urban vs. Rural Roadways, 2015-2016



Source: FARS 2015, 2016 ARF

Speeding-Related Crashes Involving Vulnerable Road Users

Differential speeds in mixed traffic is a factor in the recent increase in pedestrian and bicycling crashes and fatalities (NCSA, 2018b). In fact, pedestrian fatalities are at highest levels recorded in more than two decades. Vehicle speeding seriously impacts pedestrian and bicyclist safety not only by increasing the chances of a crash, but also by increasing the risk of death when they are involved in a crash. A higher incidence of distraction and impairment, in addition to speeding and low lighting on roadways, were reported to be causation factors in crashes involving pedestrians and bicyclists specifically during evening or nighttime hours (NCSA, 2018b; McLeod, 2014).

Pedestrians

The proportion of pedestrian deaths compared with all highway deaths rose over the past decade, from one in nine in 2007 to one in six in 2016 (NTSB, 2018). According to NHTSA, pedestrian fatalities in 2017 remain essentially unchanged, at 5,977 pedestrian fatalities (NCSA, 2018c). A recent study conducted by AAAFTS found the average risk of severe injury for a pedestrian struck by a vehicle reaches 10% at an impact speed of 16 mph, 25% at 23 mph, 50% at 31 mph, 75% at 39 mph, and 90% at 46 mph. The average risk of death for a pedestrian reaches 10% at an impact speed of 23 mph, 25% at 32 mph, 50% at 42 mph, 75% at 50 mph, and 90% at 58 mph (AAAFTS, 2017). Recent studies suggest that even small decreases in travel speed can reduce pedestrian crash and injury severity and save lives.

States reported that the largest proportion of pedestrian fatalities occur in areas with divided highways, which often have speed limits of 45 or above. These roads are limited access and often do not have safe crossing opportunities. In addition, these roads have long segments of roadway without stoplights or intersections, therefore drivers can reach higher speeds and increase risk of pedestrian crashes, injuries and fatalities.

Bicyclists

Excessive vehicle speeds also have serious implications for bicyclists. The League of American Bicyclists attempted to track and analyze every bicyclist fatality in the U.S. between 2011 and 2013, finding that 44% of fatalities occurred on high-speed urban arterial roads (McLeod and Murphy, 2014). A recent study from Texas A&M University found, "While high design speeds are viewed as desirable for motorist safety, they are not safe for pedestrians and bicyclists" (Essex et. al, 2017). In 2017, there were 783 bicyclists killed in traffic crashes in the United States (NCSA, 2018b). States reported that the increase in bicyclists and pedestrians on our roads calls for increased efforts to ensure the safety of all road users, including reducing incidence of speeding. Reducing speeding-related bicyclist fatalities by identifying countermeasures and implementing infrastructural improvements such as traffic calming measures and road diets is essential to improving overall road safety.

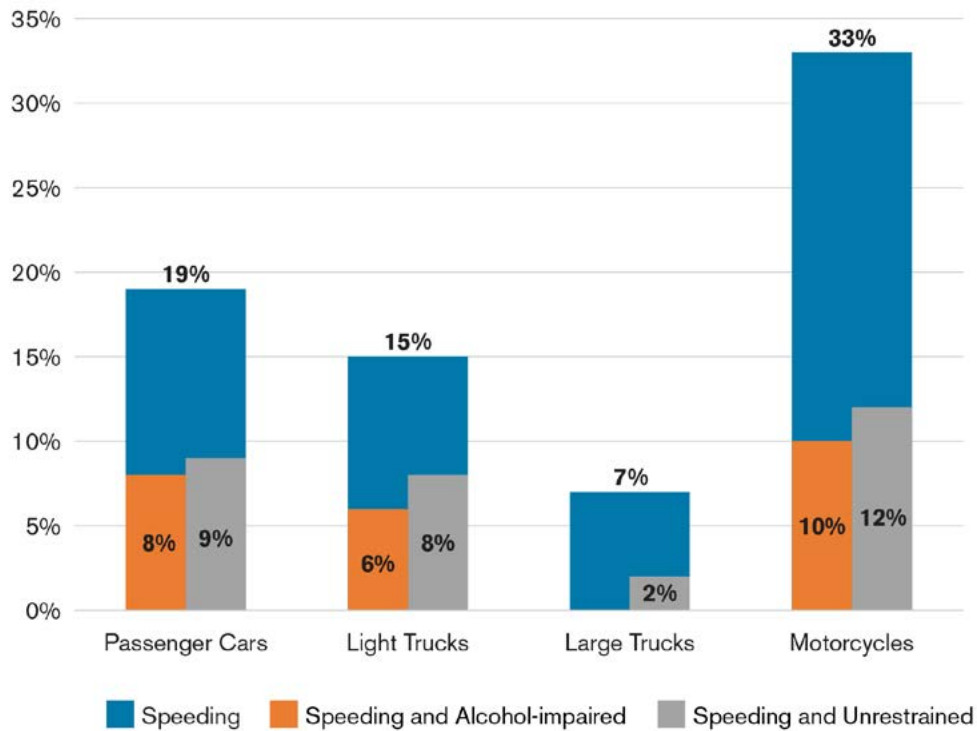
Vehicle speeding seriously impacts pedestrian and bicyclist safety not only by increasing the chances of a crash, but also by increasing the risk of death when they are involved in a crash.

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Motorcycles

Motorcycles, especially those built with high performance features, can reach extremely fast speeds. These motorcycles are capable of higher acceleration and quicker stops than other motor vehicles. NHTSA reported that 33% of all motorcyclists involved in fatal crashes in 2016 were speeding, compared to 19% for passenger vehicle drivers (NCSA, 2018d). In 2016, motorcyclists were over-represented in fatalities involving speeding, speeding and alcohol impairment, and speeding with no restraints (unhelmeted), at higher percentages than all other vehicle types (Figure 6). NHTSA also reported that in 2016, 12% of motorcycle riders involved in fatal crashes were both speeding and un-helmeted.

Figure 6. Percentage of Speeding, Alcohol Impairment, and Failure to Use Restraints Among Drivers Involved in Fatal Crashes, by Vehicle Type, 2016



Source: FARS 2015, 2016

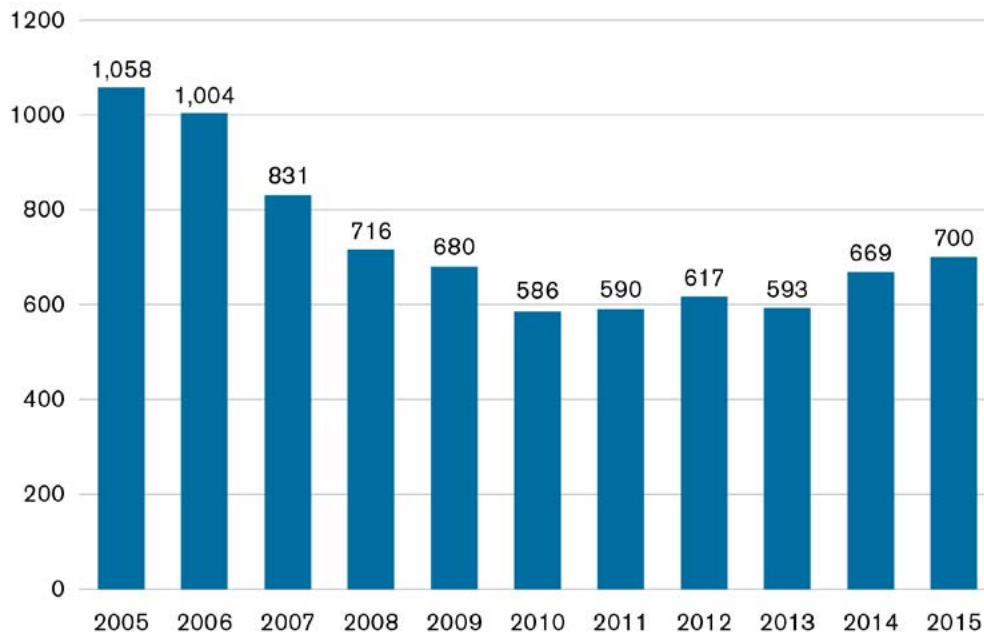
Respondents to GHSA's survey of the states reported similar trends. Most states related that the highest number of vulnerable road user fatalities involved motorcycles and that the main cause for these crashes was speeding. States also reported that alcohol involvement was most prevalent in speeding-related crashes involving motorcycles over any other passenger vehicle type.

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Work Zones

Speeding is particularly dangerous in work zones. In 2015 there were an estimated 700 crash fatalities in work zones, an increase of 4.6% over 2014 (Figure 7). This contributes to the rise in work zone fatalities since 2010 (Figure 7). If fatalities occurred in work zone crashes at the same rate as non-work zone crashes, that would mean a total of 164 lives saved in 2015 (FHWA, 2017).

Figure 7 Work Zone Fatalities in the U.S., 2005-2015



Source: FARS 2015, 2016

Temporary speed limit reductions are a common countermeasure aimed at improving work zone safety, particularly when the work is occurring on or near the roadway. In theory, reduced speed limits may serve at least three important functions: to reduce variability in travel speeds and the potential for work zone crashes, to reduce average travel speeds and the severity of crashes when they do occur, and to enhance worker safety. A study conducted by the Center for Transportation Research and Education Institute for Transportation at the Iowa State University found that speeds were consistently reduced when work zone speed limits were in place. Overall, work zone speed limit reductions of 10 mph in locations where the normal statutory speed limit was 65 mph showed the largest reduction in all speed percentiles (Sharma, 2017).

Some states are bolstering penalties for speeding in work zones. For example, Illinois enacted a law in 2015 imposing immediate jail time for drivers exceeding a certain speed in a work zone. Also, Minnesota enacted a law in 2014 imposing a \$300 fine for speeding in a work zone (Essex, 2017).

THE COLLECTION OF SPEEDING-RELATED CRASH DATA

States report that thorough aggregation of accurate traffic safety data is one of their most significant struggles regarding monitoring and oversight of traffic safety programs. This challenge extends to the collection of data about speeding-related crashes.

The Use of Statewide Standardized Crash Reports

Each jurisdiction establishes what crash data is collected and aggregated into the statewide crash database by the contents of its crash report, which is completed for each incident by local crash investigators. Uniform crash reports are integral to providing consistent and accurate data, and most states report the use of standardized crash reports across the state. However, some crash reports vary not only from state to state across the U.S. but also may vary between local jurisdictions within a state. When crash report elements are not standardized among local, state and federal agencies, this affects the quality of reported crash data on all levels.

NHTSA offers a uniform definition of a speeding-related crash: if any driver in the crash was charged with a speeding-related offense, or if a police officer indicated that racing, driving too fast for conditions, or exceeding the posted speed limit was a contributing factor in the crash (NCSA, 2018d). All states have variations on this definition that impact how speeding-related data is recorded (NTSB, 2017).

In 1988, NHTSA and GHSA developed a tool to achieve greater crash report uniformity, the Model Minimum Uniform Crash Criteria (MMUCC) guidelines, which define a minimum set of motor vehicle crash data elements that states should include in their state crash data systems. MMUCC includes speeding-related attributes. In 2017, the fifth edition of MMUCC was released (MMUCC 5). This edition gave states more flexibility in how they collect crash data and streamlined the collection of more detailed information on fatal crashes. A “dynamic data element” was also introduced to capture data on rapidly-changing topics (NCSA, 2017).

Potential Under-Reporting of Speeding as a Causation Factor

It is difficult for crash investigators to determine the exact cause of every crash, or to identify a single cause, because sometimes more than one factor contributes to a crash. This means the role of speeding in crashes is likely to be underestimated. Further, even though speeding may not be identified as the primary causal factor in a crash, it does play a critical role in the severity of many crashes because of the amount of force involved, even at lower speeds.

In GHSA’s survey of the states, respondents reported several inconsistencies across the country regarding ability to report speeding as a causative factor in a fatal crash. Several states said that speeding is likely under-reported in their crash reports. Some noted their crash reports and databases allow for only one or two major contributing circumstances for the crash, therefore excluding key information for multiple-cause crashes. Other states reported speeding-related fatalities are accurately reported in their states because their current crash reports allow an officer to report a crash as speeding-related separately from driver actions, or their crash reports and databases allow for multiple contributing circumstances on a crash report, allowing for accurate reporting of speeding-related crashes. It is clear from the state responses that crash reports and databases define and at times limit the ability to add multiple causation factors for fatal crashes.

PUBLIC OPINION AND THE CULTURAL ACCEPTANCE OF SPEEDING

A 2017 national survey of drivers conducted by AAAFTS found that half of motorists (50.3%) reported exceeding the speed limit by 15 mph on a freeway and 47.6% reported driving 10 mph over the speed limit on a residential street in the past month. In addition, this study found that there is a greater disapproval by drivers for speeding on a residential street than on freeways. Of those respondents, 79.3% feel that speeding on freeways is a serious or somewhat serious threat to their safety, and 88.2% view drivers speeding on residential streets as a very serious or somewhat serious threat to their personal safety. However, 23.9% of respondents believed that speeding 15 mph above the posted speed limit on the freeway is “completely” or “somewhat” acceptable (AAAFTS, 2018).

These self-reported behaviors and attitudes have varied only slightly in the previous ten years. The 2008 Traffic Safety Culture Index, also performed by the AAA Foundation for Traffic Safety, found that 45% of drivers reported exceeding the speed limit by 15 mph on a major highway and 76% of drivers regard excessive speeding as a serious problem (AAAFTS, 2008). The AAA Foundation has long found that actual driving behaviors often contradict drivers' attitudes about safety, sustaining a “do as I say, not as I do” culture on the roads applicable to many traffic safety issues. With regard to excessive speeds, these findings suggest that most drivers have an unrealistic view of their ability to avoid a crash or drive proficiently and safely when speeding.

Changing these beliefs will require increased public safety education that more effectively changes drivers' risk perceptions of either getting a ticket, causing a crash, or violating social norms. Indeed, drivers likely exceed speed limits by small amounts every day, observe nearly every other motorist doing the same, and determine that “nothing bad happens,” reinforcing this risky behavior. Drivers often assume that they can exceed the speed limit by 10 or even 15 miles per hour before they will be pulled over. After years of perceived tolerance regarding enforcement, speed limits have lost the concept of “limit” (AARB, 2016).

FEDERAL AND STATE POLICY

Status of Federal Leadership

The pervasive cultural attitude that accepts speed as the cost of doing business is reflected in how the issue ranks in the scale of national traffic safety priorities. A study conducted in 2017 by NTSB found that the current level of emphasis on speeding as a national traffic safety issue is lower than warranted and insufficient to achieve the goal of zero traffic fatalities in the U.S. In addition, current federal aid programs do not require or incentivize states to fund speed management activities adequate to the national impact of speeding on fatalities and injuries (NTSB, 2017).

Since the national maximum speed limit was repealed in 1995, the federal government's approach to speed management has been mostly to provide funding and resources directly to states. Congress directs that states may use funds from the NHTSA State and Community Highway Safety Grant Program to reduce injuries and deaths resulting from motor vehicles being driven in excess of posted speed limits (23 U.S.C. § 402 (a)(2) (2017)). Congress has

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also created NHTSA National Priority Safety grant programs focused exclusively on a number of specific traffic safety issues, but speeding is not among them (GHSA, 2018b).

NHTSA coordinates national high-visibility enforcement campaigns on substance impairment (“Drive Sober or Get Pulled Over;” “If You Feel Different, You Drive Different”), distracted driving (“U Drive. U Text. U Pay.”), and occupant protection (“Click It or Ticket”), and has dedicated pedestrian and bicyclist safety initiatives, but nothing currently similar to speeding, even though the data show that excessive speed contributes to nearly the same proportion or number of deaths as alcohol impairment and lack of proper restraint. In 2014, the U.S. Department of Transportation (U.S. DOT) published a Speed Management Program Plan that identifies important actions to reduce speeding-related fatalities, but U.S. DOT has not tracked or ensured the implementation of these actions (NHTSA, FHWA, and FMCSA, 2014; NTSB, 2017).

The Federal Highway Administration (FHWA) also provides a number of resources to help states design roads safely and otherwise manage speeding (FHWA, 2018).

State Approaches to Speed Limits

Speed limits are set by statute. State laws set maximum speed limits for each type of roadway (e.g., interstate highway, two-way undivided highway) and road location (urban or rural) (FHWA, 2009). Statutory maximum speed limits can be established for special situations such as school zones. Often, engineers or county or local lawmakers set speed limits on individual roads. Speed limits may be set or adjusted based a range of engineering principles, on observations of speeds at specific road segments where limits can be raised to match the 85th percentile speed of free-flowing traffic, or even based on citizen requests (FHWA, 2009).

Increasing Speed Limits

Change in speed limits is often subject to intense, and now more frequent, social and political debates. In 2015, 43 states considered 114 bills related to speed limits, of which 19 were enacted (NCSL, 2018). Many state legislatures have contributed to a new national trend of authorizing even higher speed limits on freeways and interstates.

Currently, 22 states have maximum speed limits of 70 mph, and 10 states (Arizona, Colorado, Kansas, Louisiana, Maine, Michigan, Nebraska, New Mexico, North Dakota and Oklahoma) have maximum speed limits of 75 mph on some portion of their roadway systems. On some sections of interstates in seven states (Idaho, Montana, Nevada, South Dakota, Texas, Utah and Wyoming) speed limits are 80 mph. In October 2012, a 41-mile stretch of Texas State Highway 130 opened with a speed limit of 85 mph (IIHS, 2018b). Current speed limits by state can be found [on the GHSA website](#) (GHSA, 2018a).

In GHSA's survey of the states, those with recent increased speed limits noted an increase in speeding-related fatalities. This outcome has historical precedent.

In 1973, Congress established a maximum speed limit of 55 mph in response to oil shortages and directed U.S. DOT to withhold highway funds from states that did not comply. At the time, most states had set rural interstate speed limits at 70 mph and 55 mph in urban areas. All states made changes to adopt the 55 mph national maximum speed limit by March 1974. In 1987, because the oil shortage had subsided, Congress allowed states to increase speed limits once again, this time to 65 mph on rural interstates. In 1995, the national maximum speed limit was repealed, allowing states to set their own limits. Subsequently, several

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states raised speed limits on both rural and urban interstates and freeways, with troubling consequences for road safety.

Research has shown raising speed limits to match the 85th percentile speed increases the average operating speed of the roadway, consequently increasing the 85th percentile speed. In Texas, when the speed limit was raised from 55 to 70 mph on three urban freeways, the percentage of drivers traveling faster than 70 mph increased from 15% to 50%, while the number exceeding 75 mph increased from 4% to 17% (Retting and Greene, 1997). In California, urban freeway limits were raised from 55 to 65 mph, and drivers traveling faster than 70 mph increased from 29% to 41%. Ten years after speed limits were raised from 65 to 75 mph on rural interstates, the proportion of passenger vehicles exceeding 80 mph tripled in Nevada and nearly tripled in New Mexico (Retting and Teoh, 2008). Additionally, speeding-related fatality declines were observed on urban freeways in California and Nevada where speed limits did not change despite large increases in traffic volume.

Speeding-Related Crash Rates in Relation to Increasing Speed Limits

A NHTSA study conducted by Liu and Chen found that speeding-related crashes due to driving too fast for conditions were more likely to have occurred on roads with higher speed limits (50+ mph) as compared to other crashes. IIHS conducted a series of studies on interstates in various years following speed limit increases. Earlier studies found that deaths had increased by at least 15% when states began increasing speed limits. The more recent studies showed at least a 35% increase in speeding-related fatalities when limits were increased (IIHS, 2018b).

Reducing Speed Limits

In the past few years, several states have authorized localities to reduce their maximum speeds to create a safer travel environment for vulnerable users. As previously mentioned, a small reduction in speed can mean the difference between life and death for pedestrians, bicyclists, school children, people with disabilities and others (Essex et. al, 2017).

In 2013, the Washington legislature enacted a law allowing municipalities to establish a maximum speed limit of 20 mph in a residential or business district. This new law mandates that a reduced speed need not be based on any traffic or engineering studies, which were acknowledged as procedural roadblocks to making speed limit changes. The law also allows a municipality to reinstate a former speed limit if deemed necessary within a year of its change without a traffic or engineering study. New York City, which has a high-profile Vision Zero initiative, reduced its citywide speed limit to 25 mph as authorized by a 2014 New York State law.

As of January 9, 2017, Boston reduced its default speed limit from 30 mph to 25 mph. IIHS evaluated the effects of this speed limit reduction and found that the reduction was associated with a 0.3% reduction in mean speeds. However, when looking at the odds of vehicles exceeding 25 mph, 30 mph, and 35 mph, reductions were increased to 2.9%, 8.5%, and 29.3% respectively. This study concluded that lowering the speed limit in urban areas is an effective countermeasure to reduce speeds and improve road safety (Hu and Cicchino, 2018b).

A small reduction in speed can mean the difference between life and death for pedestrians, bicyclists, school children, people with disabilities and others.

STATE PROGRAM EFFORTS TO REDUCE SPEEDING-RELATED CRASHES AND FATALITIES

Focus on Enforcement

Most states reported implementing strategies to reduce speeding-related fatalities, including focused data-driven enforcement using zero-tolerance safety corridors, HVE, overtime traffic enforcement, automated enforcement (where permitted), and dedicated aggressive driving wave enforcement. These efforts are often funded by federal and state grants. Some states reported that the identification of impaired driving offenders relies heavily on speed violations, and so these enforcement efforts are typically combined. Most states reported the use of LASER, RADAR, and Visual Average Speed Computer And Recorder (VASCAR) devices to calculate the speed of a moving vehicle and identify speeding drivers.

Public Outreach Countermeasures

In GHSA's survey of the states, several respondents reported the use of public outreach and education efforts, including media campaigns and variable message signs, to reduce speeding-related fatalities. States also employ engineering strategies such as traffic calming, mounted dynamic speed signs and roadway markings. Some states reported establishing "Travel Safe Zones" where speeding citations would result in double fines.

Program Obstacles

In GHSA's survey, respondents reported a reduction in the number of law enforcement officers available for traffic enforcement, limiting the ability for jurisdictions to adequately enforce speeding and aggressive driving laws. In addition, several states have experienced reductions or even eliminations of various enforcement efforts. It was noted that the lack of a specific federal grant program dedicated to speed enforcement hinders the ability for states to dedicate specific speeding-reduction efforts. Speeding enforcement is often "piggy-backed" on other national campaigns, including "Click It or Ticket" or impaired driving enforcement mobilizations. States with recently increased speed limits also noted lack of funding and other resources for speeding-related enforcement efforts.

Automated Speed Enforcement (ASE)

ASE enables local law enforcement agencies to enforce traffic laws remotely. Photo radar systems are deployed using a number of techniques, including fixed systems mounted on poles or other structures and mobile systems mounted in a vehicle, such as a van. ASE systems employ speed measuring devices (RADAR or LIDAR) linked with cameras that capture violations; these are later processed, and a citation is issued to the vehicle owner or driver. Each community's enforcement threshold is set based on a variety of factors but is often at 11 mph or 12 mph over the posted speed limit.

According to research conducted by IIHS, ASE can substantially reduce speeding on a wide range of roads. IIHS studies of cameras on residential roads in Maryland, on a high-speed roadway in Arizona and on city streets in the District of Columbia found that the proportion of drivers exceeding speed limits by more than 10 mph declined by 70%, 88% and 82%, respectively, six to eight months after cameras were introduced (IIHS, 2018a).

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The Maryland study found that speed cameras were mostly favored by the public and associated with a 10% reduction in mean speeds and a 62% reduction in the likelihood that a vehicle was traveling more than 10 mph above the speed limit at camera sites. Results of the study also found that the camera program reduced the likelihood of a crash resulting in an incapacitating or fatal injury by 39%. (Hu and McCartt, 2016). This study supports the evidence that speed cameras can reduce speeding, leading to reductions in speeding-related crashes resulting in serious and or fatal injuries.

Despite the research showing the safety benefits of ASE, some jurisdictions and members of the public are still opposed to the use of this technology.

Opponents often claim that ASE violates a variety of constitutional and other legal protections, though courts have consistently upheld their legality. Many motorists remain wary of any kind of state “surveillance.” In a culture where speeding is pervasive and accepted, ASE may also feel like unfair, individualized harassment. Finally, ASE and red light camera enforcement programs have a mixed history with some now-defunct programs focused blatantly on raising revenue rather than advancing safety. The demise of many automated enforcement systems can be directly credited to the ire of state and local policymakers and their constituents.

Although local surveys have found support for ASE, national surveys of motorists have found much less enthusiasm compared to support for other traffic safety laws. According to the AAAFTS Traffic Safety Culture Index survey, laws authorizing the use of speed cameras to ticket drivers who drive more than 10 mph over the speed limit in residential areas were rated only somewhat favorably. The proportion of drivers who support having cameras automatically ticket drivers who speed more than 10 mph in a residential setting is only a fraction of those who see the behavior as a personal threat (AAAFTS, 2018).

Many states have enacted legislation to permit, limit or prohibit the use of speed cameras at either the state or local level. As of November 2018, 13 states have passed laws prohibiting (with very narrow exceptions) the use of speed cameras. Twenty-eight states have no law addressing speed cameras. All other states either permit the use of speed cameras (two + D.C.) or limit their use by location or other criteria (seven + U.S. Virgin Islands). Twelve states, the District of Columbia and the U.S. Virgin Islands have speed cameras currently operating in at least one location (GHSA, 2018c). A list of speed camera laws by state can be found [on the GHSA website](#) (GHSA, 2018c). In GHSA's state survey, respondents in states that prohibit automated speed enforcement noted these bans as barriers to speed-reduction efforts, especially when funding and other resources are limited.

Despite the many concerns, states and localities have many resources available to develop and deploy well-managed ASE programs focused on safety and public acceptance. In 2008 NHTSA and FHWA published the “Speed Enforcement Camera Systems Operational Guidelines” to assist state and local agencies in planning and operating ASE systems as a component of comprehensive speed management programs. In 2016, NHTSA conducted a “System Analysis of Automated Speed Enforcement Implementation” to evaluate these guidelines and identify state implementation strategies for these systems. This study showed that ASE programs had been increasing in recent years; however, some jurisdictions had terminated their ASE programs. Of the 11 responding agencies that had discontinued ASE programs, most cited that ASE programs were terminated due to decisions by elected leaders, followed by economic factors. Other reasons cited for terminating programs included litigation, contractual issues and concerns with state legislative changes. None of these agencies reported program termination due to inaccuracy of the equipment, faulty maintenance, or other systemic problems (Miller et. al, 2016).

ROADWAY INFRASTRUCTURE

Although road design is not a factor that SHSOs can typically influence, SHSO may take the built environment into account when planning for educational outreach programs to reduce speeding-related fatalities. Safety advocates can target such programs to encourage drivers to slow down in areas where inappropriate rates of speed have been known to cause crashes on certain types of roadways.

Curved Roadways

To address roadway departures resulting from misjudging appropriate speeds on curved roadways, FHWA finds that countermeasures are most effective when applied specifically at horizontal curves. FHWA recommends several techniques that can be implemented to reduce speeds at these roadway segments, including: flashing beacons; profile thermoplastic markings; and raised pavement markers, reflectors or panels of retroreflective sheeting. The attachment of reflectorized tape or other delineation device to trees, utility poles, and other roadside obstructions is a low-cost way to reduce the crash hazard from fixed objects. In addition, a combination of speed measuring devices with a flashing beacon and a variable message sign has been found to have an effect on high-speed drivers in high-crash locations. These strategies present low-cost solutions to reducing speeding-related fatalities where less expensive countermeasures have failed. For example, in California, installation of these devices resulted in a 44% reduction in crashes in the first year and 39% in the second year.

Bump Outs, Speed Humps, and Refuge Islands

Traffic calming methods have been used with success to reduce vehicle speeds. Such measures include curbs protruding into lanes to make them narrower at crosswalks (bump outs), speed humps and refuge islands between lanes.

Roundabouts

Roundabouts have been found to be a safer alternative to traffic signals and stop signs, specifically reducing injury crashes and improving traffic flow (Hu et. al, 2013). The tight circle of a roundabout forces drivers to slow down, reducing and/or eliminating the most severe types of intersection crashes: right-angle, left-turn and head-on collisions. When surveyed, public opinion generally favors the implementation of roundabouts as a traffic calming strategy. In addition, pedestrian crossing distances within roundabouts are short and traffic speeds are drastically reduced. Two studies have reported reductions in pedestrian crashes of about 75% after conversion to roundabouts (Hu et. al, 2013).

Roadway Infrastructure Limitations

Roadway infrastructure is generally more costly to deploy than behavioral interventions and infrastructure improvement needs are extensive, but the impact of new infrastructure on safety can be enduring (Hardwood, et al., 2017). Infrastructure can also lag behind changing safety design guidelines (FHWA, 2009).

INTEGRATED SPEED MANAGEMENT PROGRAMS

In 1997, Sweden began developing its “Vision Zero” initiative which focuses on a “Safe Systems” approach that aims to integrate education, enforcement, and engineering with a focus on the safety of vulnerable users, speed management, and improving infrastructure safety as a system safety net (VisionZeroNetwork.org, 2017). The Safe Systems approach has led to dramatic declines in serious injuries and fatalities in Sweden, and has since been adopted in other European nations. More recently, themes and elements have been adopted in states and communities in the United States.

Vision Zero Network (VZN) is a U.S. nonprofit organization coordinating and supporting the adoption of Vision Zero plans in communities nationwide. As of October 2017, there were 31 jurisdictions that have joined the VZN and additional jurisdictions are considering adopting Vision Zero. (VisionZeroNetwork.org, 2017).

New York City (NYC) became the first municipality in the United States to adopt Vision Zero in 2014, and VZN considers NYC’s program to be the most robust in the country (VisionZeroNetwork.org, 2017). NYC’s Vision Zero Task Force established a Vision Zero Action Plan to set up an internal system and monitoring strategies that clearly defines roles and responsibilities of participating departments, including task and deliverable timelines. A review of data revealed severe pedestrian crashes were increasing significantly in late afternoon and evening hours in certain areas. Here improved lighting and increased enforcement were implemented, contributing to a 30% decrease in traffic fatalities for that year, compared to the three previous years (VisionZeroNetwork.org, 2017).

Portland, Oregon adopted Vision Zero in 2015 and has implemented a three part “Safe Systems” approach to manage speed (VisionZeroNetwork.org, 2017):

- Set appropriate speed limits;
- Design streets to encourage safe speeds;
- Maximize proven technology, such as safety cameras.

Portland identified a High Crash Network (HCN) consisting of 30 high crash intersections and 30 high crash streets. Based on this analysis, Portland enacted legislation to set lower speed limits, implemented various design features on the roadways to separate vulnerable road users from vehicles, and set up speed cameras. An initial evaluation in 2017 showed up to a 92% reduction in drivers exceeding 10 mph above the speed limit and a 61% decrease of speeding by all drivers.

It is important to note that though many states and communities are embracing the zero-focused goals, these programs do not necessarily comprise the full Safe Systems approach. With a focus on infrastructure improvement and vulnerable users, the most assertive Vision Zero approaches tend to occur in urban, rather than rural, areas.

Most assertive Vision Zero approaches tend to occur in urban, rather than rural areas.

VEHICLE TECHNOLOGY

Connected Vehicle Technology

Connected vehicle technology – cars equipped with Internet access and other communications capabilities that enable interactions with remote servers, other cars, and the surrounding environment – has developed very quickly over the past two decades. Popular connected vehicle services include GPS navigation, voice and text messaging services, stolen vehicle location, and vehicle-to-vehicle and vehicle-to-infrastructure communication. Connected vehicle technology can also facilitate the exchange of data generated by the vehicle, such as location, speed, rate of acceleration, fuel consumption, and other technical information.

Telematics monitoring technology – a type of connected service – has been used by employers to monitor fleet vehicles all over the world. The introduction of telematics systems by organizations with fleet vehicles has been found to reduce speeding. Andrew Page, a distribution company with 900 vehicles in the United Kingdom, has reduced speeding by 97% and crashes by 47% after deploying telematics. Telematics were also found to reduce maintenance costs and improve fuel economy (ETSC, 2016).

Telematics monitoring may also be implemented in passenger vehicles, most often with newly licensed or teen drivers to flag location, dangerous maneuvers, and speed.

Real-Time Speed Alerts and External Motivation Effect

Some GPS navigation systems and cellphone applications can provide real-time speed alerts, serving a similar function as roadside electronic signs displaying vehicle speeds, which have been shown to reduce speeding. A few aftermarket in-vehicle monitoring devices that use GPS data to provide speed alerts are available in the U.S. The device provides verbal feedback to drivers who speed, don't buckle up or drive aggressively. IIHS conducted a study to measure the effects of in-vehicle monitoring on the driving behavior of teenagers. This study found that consistent reductions in speeding were achieved only when teenagers received alerts about their speeding behavior, believed their speeding behavior would not be reported to parents if corrected, and when parents were being notified of such behavior by report cards (Farmer et. al, 2010).

Speed Limiters/Governors

A speed limiter is a governing device used on large trucks to limit the top speed of a vehicle. For some classes of vehicles and in some jurisdictions, the use of speed limiters is a statutory requirement. For others, trucking companies and individual drivers may install and program speed limiters. A speed ceiling helps ensure a truck driver can stop or nearly stop at a reasonable distance if an emergency occurs. In 2006, the American Trucking Associations and Road Safe America separately petitioned NHTSA and the Federal Motor Carrier Safety Administration (FMCSA) to require speed limiters in trucks with gross weights exceeding 26,000 pounds. The petitions called for speed governors to be set at a maximum of 68 mph. Unlike the U.S., several countries, including the European Union, Australia, and Japan, require speed limiters in all large trucks. In 2007, a survey of drivers nationwide conducted by IIHS indicated that 64% favor a speed governor requirement for large trucks. More than three-quarters of respondents who favor speed governors support a maximum speed below 70 mph. More than eight in 10 drivers said speeding on interstate highways and freeways is

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a safety problem, and four in 10 drivers said it is a big safety problem (IIHS, 2007). Currently, the U.S. DOT has reported it will not pursue a rulemaking to mandate the use of speed limiters in the trucking industry (Jaillet, 2017).

Intelligent Speed Adaptation (ISA)

ISA systems use GPS to link a vehicle's position to digital maps that include roadway speed limits and can determine if a vehicle is exceeding them by a preset amount. Some newer systems use cameras to read speed limit signs. What happens next differs depending on the ISA system. The most common scenario involves an audible or visual alert telling the driver to slow down. Some ISA systems give a haptic alert via the accelerator that makes it increasingly harder for the driver to depress the pedal. Intervention systems can reduce engine throttle to automatically decelerate a vehicle. ISA differs from the more familiar speed limiters (or governors) on commercial vehicles and buses, as an ISA allows drivers to specify the warning threshold depending on a road's speed limit as well as switch off the devices (IIHS, 2012).

Influence of Automated Vehicles (AVs)

AVs are expected to increase mobility and reduce traffic crashes, as NHTSA estimates that more than 90% of crashes can be linked to driver error. However, they raise several safety concerns that states must address, especially during the many years ahead when these vehicles will share the road with vehicles driven by humans (Hedlund, 2018b).

Some industry analysts have argued that the precision and dependability of highly autonomous vehicles could enable higher speeds, while some in the safety community have argued that AVs should drive cautiously to reflect and enforce a strong traffic safety culture. For the immediate future, as the technology is still being developed and showcased, AV developers will likely program such vehicles to diligently obey posted speed limits. A greater volume of traffic following speed limits could theoretically limit revenue from speeding infractions, though speeding vehicles may be easier to identify. It is difficult to precisely predict the influence of AVs on speed limits and traffic safety broadly; however, states should be taking these factors into consideration when planning for the future of roadways and public safety.

Vehicle Technology Limitations

Auto manufacturers are developing and integrating ever more complex safety and driver assistance technology in vehicles. While these features have tremendous potential to prevent crashes, a broad limiting factor is the time required for new technology to adequately penetrate the vehicle fleet in order to achieve population-level safety benefits. For instance, the average vehicle age in 2017 was estimated at 11.6 years (Gillies, 2017) and according to IIHS, it took nearly 20 years for electronic stability control to become standard in over 95% of new vehicle models (IIHS, 2018a).

SUMMARY AND RECOMMENDATIONS

Key Findings

This examination of the current landscape on speeding reveals a number of key findings.

Progress on the Issue of Speeding Is Limited at Best

The only thing more shocking than the oversized role speeding plays in crashes, fatalities, and injuries is the fact that little has changed over time with regards to the footprint of speed in traffic safety, public and policymaker opinion, or even the menu of countermeasures being deployed. For example, as described above, the proportion of speeding-related fatalities as a percent of total motor vehicle fatalities has remained virtually the same over time, for at least the last 17 years. Similarly, we have made inadequate progress in reducing the proportion of fatally-injured speeding young male drivers; the percentage of fatally-injured speeding drivers who are alcohol-impaired; and the percentage of fatally-injured speeding drivers who are unrestrained.

Efforts to Combat Speeding Face Political Roadblocks

The focus of speed management, at least from a behavioral traffic safety perspective, has long been on enforcement and public outreach campaigns in support of enforcement. However, states report limited interest among policymakers and stakeholders to focus on speeding and dwindling resources available to address the problem.

It is true that Vision Zero and similar programs are achieving successes, but stakeholders are typically organizing these programs in urban areas, while rural areas continue to see an elevated number of speeding-related crashes.

On the federal level, a behavioral focus on speed management is clearly de-emphasized, despite its role as a leading crash contributor.

When It Comes to Speeding, Drivers Have a Minimal Perception of Risk

Despite the best efforts of the traffic safety community, speeding remains a cultural norm. Public opinion about speeding and self-reported speeding behaviors have seemingly seen little change for at least the last ten years, and a cross-cutting “do as I say, not as I do” mentality persists.

Drivers observe the surrounding community speeding with impunity and perceive little risk of consequences. This sense of risk perception is apparent in many instances described above, such as:

- Law enforcement often identifies speeding offenders as “driving too fast for conditions.”
- Drivers’ poor judgement in negotiating speeds in curved roadways often leads to crashes.
- Many rural roads inadvertently create circumstances that promote speeding or lower driver risk perceptions.
- Younger drivers, overrepresented in speeding offenses and fatal crashes, often struggle with risk-taking behaviors.
- Motorcyclists, already engaged in a relatively riskier mode of transportation, are over-represented in crash fatalities involving speed, as well as alcohol impairment.
- Many states are increasing speed limits on certain roads with public assent, despite the proven safety detriment.

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So much has been done and so much is being done on speeding, and yet it sometimes feels like we're still at ground zero, at least when it comes to public opinions and driving practices. In order to achieve breakthroughs, the transportation community should consider a number of key steps.

Recommendations

Improve Program Management

Bolster National Leadership

By taking action, the federal government can better acknowledge the role that speeding plays in roadway deaths and signal to the states where speeding ranks as a priority for the nation's traffic safety program.

- Congress should establish a NHTSA National Priority Safety grant program dedicated exclusively to speed management.
- Congress should create and fund a new national high-visibility enforcement campaign, similar to "Click It or Ticket." Such an initiative may need to be developed on a smaller, pilot project scale before national implementation.
- U.S. DOT should re-activate its interdisciplinary Speed Management Team and more pro-actively promote speed management solutions.

Utilize State and Local Task Forces or Advisory Committees

- Task forces or advisory committees may be helpful to develop and implement speeding reductions safety initiatives. Interdisciplinary task forces have been shown to improve traffic safety programs in other contexts, such as impaired driving and traffic records. These committees can inform both local and state efforts to educate the community in addition to aid in creating support from the local community regarding speeding reduction efforts. Organizers should welcome members of law enforcement, SHSOs, advocacy groups, education and training personnel, healthcare representatives, infrastructure safety stakeholders, and others representing the differing views and opinions within the state or local community.

Promote Crash Report and Crash Database Improvements

- States should move to update their police crash forms to improve the reporting of speeding-related fatalities and support data-driven enforcement and outreach campaigns. When the information used to inform speeding-reduction strategies is inaccurate, these programs and campaigns are less effective.

Explore the Use of Integrated Speed Management Programs

- Many states and cities are adopting Vision Zero or zero-focused programs that integrate education, enforcement, and infrastructure, and seek high-level policymaker buy-in. These programs are some of the most assertive in addressing speed management.

Prioritize Enforcement

Increase Enforcement Efforts Regarding Speeding

- States and communities should implement data-driven mobilizations in areas, times, and days where a higher incidence of speeding occurs to focus enforcement resources in areas of need. Agencies may consider conducting regional campaigns, or multi-agency efforts, where resources are shared among agencies. Also, speeding-reduction efforts can be added to other mobilizations.
- States should consider roadside speed signs where available and cost-effective, which can enhance speeding-reduction efforts and campaigns.
- States and cities should also explore the use of ASE to reduce speeding-related crashes and fatalities. States in particular should remove unreasonable barriers to use of ASE. ASE can be launched in areas of higher risk, such as school zones and work zones, to promote greater public tolerance and support.

Increase Education and Training for Law Enforcement

- States should provide continuing education for law enforcement regarding the proper use of equipment to detect speed and the prioritization of crash causation and crash evaluations, which may help to reduce potential under-reporting of speeding-related crashes. Creating statewide consistency among law enforcement practices, through continued education and training of both municipal and state agencies, may also reduce this occurrence.
- Increased use of law enforcement liaisons (LELs) may help these efforts.

Improve State and Local Policy

Support Speed Limits According to Vision Zero Principles

- States and localities should set reasonable speed limits in accordance with Vision Zero principles in built-up areas where there is a mix of vulnerable road users and motor vehicle traffic, at intersections and locations with a high risk of side collisions, and on rural roads without a median barrier to reduce the risk of head-on collisions.
- States should also provide local communities with discretion to set speed limits and deploy speed management countermeasures in order to meet local needs.

Support the Improvement of Infrastructure and Enforcement if Speed Limits are to Increase

- States should seek to achieve longer-lasting speed reductions through the data-driven use of traffic-calming roadway infrastructure. The use of traffic-calming methods described above such as roundabouts, bump outs, refuge islands, early release signal timing at intersections and enhancing roadway lighting have all shown to reduce speeding. These countermeasures can be targeted in neighborhoods where vehicles and pedestrians commonly share the road. If states are considering an increase in speed limits, stricter enforcement and an upgrade of the infrastructure should be considered to compensate for the increased risk from higher mean speeds.

Identify and Deploy a Culture Change Model

Many states and communities are deploying media and educational outreach campaigns about the dangers of speeding, which are essential elements of almost all traffic safety initiatives. Though speeding is perceived by drivers as one of the highest contributing factors to roadway fatalities in the U.S. along with impaired driving, unrestrained motorists, and distracted driving, the practice of speeding is omnipresent and drivers perceive low risk in terms of crash likelihood, enforcement, or social disapproval.

In this regard, the challenge of speeding is similar to technology-driven distracted driving. Drivers view distracted driving as a leading threat and yet wireless device use behind the vehicle is likewise omnipresent. Even though enforcement is making a difference, the traffic safety community has yet to also identify a proven culture change strategy to dramatically reduce the incidence of distracted driving.

Many of the recommendations noted above can be helpful to change driver risk perception, by changing the built environment to discourage speeding and increasing the perceived presence of enforcement, either by traditional means or via ASE.

States can also incorporate into communications messages information about the role of speed in increasing the likelihood and severity of a crash, and the increased threat of speeding on vulnerable road users.

However, enforcement, crash prevention, and crash awareness are only parts of any wider effort to change culture. When it comes to the adjustment of social norms, states may want to consider a more innovative approach that draws upon a well-known success story in traffic safety achievement: the change in culture surrounding alcohol-impaired driving.

In 2006, Fell and Voas conducted a comprehensive examination of the role of Mothers Against Drunk Driving (MADD) to achieve reductions in drunk driving. Among the study's "conjectures" for success is how MADD placed "a face on the traffic injury problem," specifically creating the public idea of the drunk driving victim. The study also credits MADD for offering strong, effective victim services, offering a forum for families to share their stories, involving the victim's perspective in criminal justice proceedings via Victim Impact Panels, and promoting state victims' rights and victims' compensation laws (Fell and Voas, 2006).

Ross likewise identifies the value of creating a transgressive, wrong-doing class of persons to be targeted – the "drunk driver" (Ross, 1997).

Nationally, the issue of speed lacks these faces – of either the victim or the offender. Indeed, most drivers today could be considered offenders to some degree. The traffic safety community should consider how it can create a new transgressive, wrong-doing class of persons that puts all road users at risk – the speeding driver.

Though speeding is perceived by drivers as one of the highest contributing factors to roadway fatalities, speeding is omnipresent and drivers perceive low risk.

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While many organizations are driven by a mission to ending drunk and distracted driving, in addition to advocacy groups to protect the safety of vulnerable road users such as bicyclists, pedestrians, and motorcycles, there is a notable shortage of national organizations to reduce speeding-related crashes and fatalities. The Vision Zero Network does prioritize speed management, but as part of a larger systematic approach to creating transportation system resilience to crash incidences.

There is also no national infrastructure to give voice to speeding crash victims, despite the fact that there were 9,717 individuals killed in speed related crashes in 2017. That is 9,717 victims, not including the friends, family, and colleagues left behind to grieve. The traffic safety community should consider how it can organize this injustice and anguish to achieve life-saving policy and programmatic objectives and prevent further crashes, fatalities and injuries.

Investigate Future Solutions

The list of behavioral countermeasures for speed management is limited relative to other traffic safety issues. States may want to explore the feasibility of new approaches. For instance, speed limiters and telematics monitoring are currently deployed more in the commercial context, but could be explored as a new kind of post-conviction supervisory condition for the most egregious speeding and aggressive driving violators – the “speeding drivers” proposed above – similar to the use of ignition interlock devices (IIDs) for impaired driving offenders. Like with IIDs, a mandatory technological intervention will likely win public support by targeting the most serious offenders likely to recidivate. This approach also will likely be more effective at preventing recidivism when coupled with a driver improvement program to attempt to achieve long-term behavioral change and contribute to overall cultural evolution. Any new approach such as this would deserve rigorous evaluation to determine its safety impact.

CONCLUSION

Data and anecdote both identify speeding as a major contributing factor to crashes and deaths on U.S. roadways, but despite some notable efforts, speeding remains ubiquitous, and the resources and attention dedicated toward it remain overwhelmed by scope of the problem. States and local governments, law enforcement officers, criminal justice professionals, traffic safety advocates and researchers are on a bucket brigade in the face of a cultural tsunami that prefers to keep the pedal to the floor.

Yet there are steps the traffic community can take as a whole to advance the state of speed management – in enforcement, education, engineering and culture. To do so will require renewed commitment on all levels, from the halls of Congress to the smallest rural sheriff's office.

Speeding is sometimes relegated as a “behavioral problem” but is an undeniable traffic safety problem and unambiguously within the mandate of the State Highway Safety Offices to address. The SHSOs thus sit at a unique nexus to launch new programs, coordinate broad stakeholder collaboration, and serve as leaders in thought and deed on the state level.

The traffic safety community often aspires to work towards zero road fatalities, but there is no way we will approach zero unless we join forces to prioritize the prevention of speeding-related crashes.

Speeding remains ubiquitous and the resources and attention dedicated toward it remain overwhelmed by scope of the problem.

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