

UC Berkeley

Research Brief

Title

Motor vehicle speed as a risk factor in pedestrian safety

Permalink

<https://escholarship.org/uc/item/5t075099>

Authors

McMillan, Tracy

Cooper, Jill F

Publication Date

2019-03-01

Motor vehicle speed as a risk factor in pedestrian safety

Tracy McMillan and Jill Cooper
March 2019

Speed is a significant risk factor in road safety. Several recent reports from the National Transportation Safety Board (NTSB) and the Governors Highway Safety Administration (GHSA) highlight the need for a greater focus on speed management at the national, state and local level. This research brief summarizes some of the findings from these reports, as they relate to pedestrian safety.

OVERVIEW OF THE ISSUE

The NTSB 2017 report, Reducing Speeding-Related Crashes Involving Passenger Vehicles, aptly states “...the relationship between speed and the severity of injuries is consistent and direct—higher crash speeds result in injuries that are more severe. The effect of speed is especially critical for pedestrians involved in motor vehicle crashes because pedestrians lack protection.” (NTSB, 2017, ix)

The report concluded that greater emphasis should be placed on speeding as a national traffic safety issue given the lives impacted and the stated goal of zero traffic fatalities in the United States.

DATA

- Nationally, the proportion of pedestrian deaths compared to all highway deaths rose from one in nine in 2007 to one in six in 2016.
- There were 432 pedestrian fatalities in California in the first half of 2018.
- 30% of motor vehicle fatalities in California in 2017 were speeding-related.
- A majority of pedestrian fatalities occur at non-intersections, and urban arterials are the most common roadway type on which pedestrian fatalities occur. These two factors suggest areas of higher speed and traffic volume.

FACTORS ASSOCIATED WITH SPEED

The NTSB and GHSA reports outline several factors associated with speed and crashes. As noted in the 2017 NTSB report, the relationship between speed and crashes is complex; however, an understanding of these factors and their relationship with speed and crash risk is important for the development of policy and programming.

Impairment (DUID)

Alcohol has been a consistent factor associated with speed and crashes, and an increasing amount of research is examining the association of marijuana and prescription drugs on driving behavior such as speed. (GHSA, 2019)



Figure 1. The effect of speed on a driver's field of vision and the risk of pedestrian death (Photo credit: LADOT)

Age and Gender

Males are over-represented in crash data, as both offenders and victims. Crash data indicates that young males are more likely to commit a speeding offense and be repeat speeding offenders. Males as a whole were overrepresented in speeding-related fatalities (all fatalities, not exclusive to pedestrian fatalities). Males were also more likely to be victims in pedestrian fatalities (all pedestrian fatalities, not exclusive to speeding-related).

Distraction

Distracted driving, which the National Highway Traffic Safety Administration describes as any activity that takes drivers' attention away from driving, is a serious issue on roadways today. Distraction, like impairment, may impact a driver's reaction time, which is critical at all times but increasingly so as speeds increase (Figure 2).

Aggressive driving and other risky behaviors

Research has shown an association between speeding and other risky driving behaviors, including aggressive driving and failure to use a restraint.

Roadway and environmental factors

Drivers may exceed the posted speed limit due to the roadway design factors such as street width, block lengths, and degree of curvature of the roadway. Drivers may drive too fast for conditions due to environmental factors such as inclement weather, curves in roadway, congestion, quality of road surface, and adjacent land uses. It should also be noted that roadway design factors affect the 85th percentile speed and therefore the posted speed limit.

Public opinion on speeding

The NTSB report on reducing speed-related crashes with passenger vehicles found that national, state, and local traffic safety stakeholders felt that unlike other crash factors such as alcohol impairment or unbelted occupants, speeding has few negative social consequences associated with it and that the public largely underappreciates the risks associated with speeding. National and California traffic behavior and opinion surveys support this finding.

National data from the AAA Foundation for Traffic Safety found that 50.3% of motorists reported exceeding speed limit by 15 mph on a freeway and 47.6% reported exceeding by 10 mph on residential street in the past month. Somewhat ironically, a large majority of these motorists also reported that speeding in either setting is a serious threat to their personal safety. (AAAFTS, 2018)

The 2018 California Traffic Safety Survey, a public opinion survey sponsored by the Office of Traffic Safety, had similar findings. Drivers participating in the survey ranked speeding/aggressive driving as their top safety concern from 2016-2018, and in the top 3 safety concerns since the survey began in 2010. However, approximately 57% of respondents reported that it is safe to exceed the speed limit by 10 mph on freeways. In contrast, only about 33% of respondents indicated it is safe to exceed the speed limit on residential streets by 5 mph. Drivers age 18-24 were more likely to indicate it was safe to exceed the speed limit on residential streets. Over 60% of drivers felt it was very likely or somewhat likely that they would be ticketed if they exceeded the speed limit.

CONCLUSION

The NTSB Special Investigative Report on Pedestrian Safety states that the “overwhelming safety factor for a vehicle striking a pedestrian remains the physics of differential mass (the weight and size of a pedestrian compared with that of a vehicle), plus the lack of protection afforded pedestrians. Consequently, of primary importance is mitigating speed or avoiding impact.” (NTSB, 2018, p.16)

“The effect of speed is especially critical for pedestrians involved in motor vehicle crashes because pedestrians lack protection.”

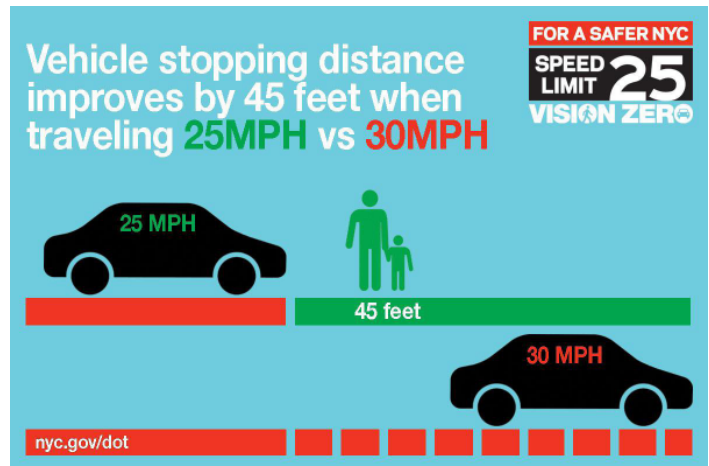


Figure 2. Speed and vehicle stopping distance (Photo credit: NYCDOT)

The NTSB and GHSA reports contain several recommendations at the federal, state and local level related to speed mitigation and management. One recommendation, as supported by the data on public opinion on speeding and stakeholder interviews conducted by the NTSB, is a culture change around speeding. The reports outline steps to move in that direction, such as: 1) a coordinated effort among safety advocacy groups; 2) the identification of a national group to spearhead the issue like MADD did for alcohol-impaired driving; and 3) strong leadership from government. The latter is critical in order to maintain and expand federal and state grant opportunities that support programmatic and media efforts related to speed.

Both reports also recommend a review of processes to establish speed limits, which also affects the ability to enforce. [California Assembly Bill 2363](#), passed in the fall of 2018, establishes a Zero Traffic Fatalities Task Force to: review current processes of establishing speed limits at the local, state, national and international levels, the usage of the 85th percentile in urban and rural settings, alternatives to the 85th percentile as a method for determining speed limits and how local bicycle and pedestrian plans may affect the 85th percentile.

Works cited:

- AAA Foundation for Traffic Safety (2018). 2017 Traffic Safety Culture Index. Washington, DC: AAA Foundation for Traffic Safety.
- California Assembly Bill 2363 (2018). Friedman. Zero Traffic Fatalities Task Force. Approved September 21, 2018. Sacramento, CA
- Ewald & Wasserman Research Consultants, LLC. (2018, September). California Traffic Safety Survey 2018. Elk Grove, CA: California Office of Traffic Safety.
- National Transportation Safety Board (2018). Pedestrian Safety. Special Investigation Report NTSB/SIR-18/03. Washington, DC.
- National Transportation Safety Board (2017). Reducing Speeding-Related Crashes Involving Passenger Vehicles. Safety Study NTSB/SS-17/01. Washington, DC.
- Powell, T. (2019). Speeding Away From Zero: Rethinking A Forgotten Traffic Safety Challenge. Governors Highway Safety Association, Washington, DC.
- Retting, R. (2019). Pedestrian Traffic Fatalities by State: 2018 Preliminary Data. Governors Highway Safety Association, Washington, DC.