

Slowing Traffic: A Fresh Look at an Old Problem

With their potentially fatal mix of pedestrian and automobile traffic, campuses must deal with the persistent problem of speeding. Knowing the truths and myths about this issue can help university, hospital and school parking professionals put the brakes on accidents, injuries and deaths.

- by John Dixon

While most drivers today understand there is a correlation between speeding and the number of accidents that occur, few consider that the rate of speed also affects the severity of accidents when they do happen. In fact, studies examining pedestrian accidents show that reducing speeds by merely 5 to 10 mph can make the difference between a minor scrape and a fatality.

It's estimated that only 5 percent of pedestrian accidents result in a fatality when the vehicle is traveling 20 miles per hour or less. According to Rudolph Limpert's *Motor Vehicle Accident Reconstruction and Cause Analysis*, this dramatically increases to a fatality rate of around 40 percent when the vehicle is traveling 30 mph, and 83 percent at 40 mph.

In other words, even if the accident is not prevented, by reducing the speed at which a vehicle-pedestrian crash occurs, the risk of death or serious injury is reduced. And the critical speed range for achieving the most dramatic reduction in injury and death is the very speed range we are typically dealing with on campuses and in school zones. Even an alert driver with quick reflexes who reacts within 1 second, if traveling at 30 mph will not even begin to slow down before hitting a pedestrian that appears 50 feet in front of him or her. The same driver traveling 20 mph would have enough time to come to a complete stop before hitting the pedestrian.



So it's clear that even a small reduction in traffic speed can have a dramatic impact on reducing injuries and saving lives. One report done by the Transport Research Laboratory called *Speed, Speed Limits and Accidents* concludes that each 1-mph reduction in traffic speed results in a 5-percent reduction in vehicle collisions and an even greater reduction in fatalities.

Given these facts, attention to speed reduction deserves high priority status in any safety program where pedestrians and traffic are involved. But first, it's important to have a thorough understanding of the various traffic-calming solutions to determine the most viable options.

Crosswalks Are Common, Cheap, Not Very Effective

Due to their relative ease of installation and low-cost, marked crosswalks are one of the most commonly used methods to slow drivers and enhance pedestrian safety. A closer look at research, however, suggests that they might not be as effective as presumed. In fact, several studies found that crosswalks may actually invite accidents.

A survey conducted by the Transportation Research Board of 400 uncontrolled intersections in San Diego found there were significantly more pedestrian collisions in marked crosswalks than in unmarked crosswalks. Another study by the city of Portland, Ore., concluded that most pedestrian injuries happen in the crosswalk.

There is a lot of speculation regarding the reason for these findings. Perhaps pedestrians feel unduly safe crossing in marked crosswalks and, therefore, do not take adequate precautions. Or maybe it's that the painted markings are not as visible to the driver as they could be. In any event, their effectiveness is questionable. At the least, most traffic engineers agree that marked crosswalks are best used in combination with other traffic control treatments such as stoplights, meridian strips or curb extensions.

Signs Prevent Crashes, Don't Reduce Speed

Stop signs are generally used to indicate which driver has the right-of-way at an intersection. They are great at preventing crashes but not as good at getting drivers to reduce speeds. In fact, it's been found that drivers often increase their speed after stopping at a stop sign. When signs are posted for the purpose of slowing traffic, studies show that drivers often exhibit a resentful attitude toward them. This increases the chance of the driver simply running the stop signs as well as speeding. One study conducted by the city of Millbrae, Calif., showed that speeds actually increased after "Slow" signs were installed.

Perhaps less surprising, a variety of studies conducted in the United States found that motorists consistently ignore posted speed limits. It was determined that drivers do not operate by the speedometer but rather by the speed at which they feel is reasonable given the current road conditions. Even when odd signs (indicating a speed of 131/2 mph, for example) are installed in order to draw special attention to the posted speed limit, no significant reduction in speed was noted.

Speed Bumps Somewhat Effective, Noisy

Speed bumps are another popular choice for slowing traffic. At approximately \$1,200 per installation, their cost is moderate, and anecdotal studies seem to indicate they have some positive effect in slowing traffic.

Speed bump effectiveness, however, is contingent on a variety of factors including the bumps' design and the speed of traffic. Tests on "short" bumps (6 inches to 3 feet) produced more discomfort to the driver than longer bumps — and therefore were more effective — at slower speeds. According to Lawrence Walsh's research, however, these same bumps produced little or no discomfort as speeds increased. The resulting effect is that the bumps may actually entice drivers to drive faster rather than slower.

This method also creates noise. Researchers of one study estimated cars passing over speed bumps increased the volume of car noise by 10 to 20 decibels. Another test found that cars driving over the bumps at 10-15 mph had a noise level equal to a car traveling 25-30 mph. Trucks passing over the bumps at 5 to 10 mph had a noise level equal to a truck going 25-30 mph. Walsh's study also concluded that the slower speed made the noise last over a longer period of time.

Speed bumps can also impede fire trucks and ambulances. For this reason, most city traffic departments today limit the use of speed bumps to select surface streets not typically used by emergency vehicles.

One last consideration is the fact that speed bumps, like stop signs, often have a negative effect on adjacent streets. Drivers will often change their driving patterns to avoid the bumps altogether, which simply moves the problem from one street to another.

Rumble Strips Reduce Speeds, Hazardous to Bicyclists

Unlike speed bumps, rumble strips appear to have little effect on overall traffic volume. They do appear to be effective in reducing speeds, especially when placed 300 to 500 feet from a stop sign, intersection or other approaching event where slower speeds are desired. A test in Contra Costa County, Calif., found that rumble strips placed before a busy intersection effectively slowed average traffic speed from 41 mph to 37 mph. A similar study in San Francisco by the Highway Research Board found they reduced speeds from 5 to 15 mph.

Unfortunately, the use of rumble strips, like speed bumps, increases traffic noise and may be hazardous to bicyclists. For these reasons, their deployment requires careful consideration.

Radar Speed Signs Slow Traffic, Require Power

New technology has produced new methods for slowing traffic. One of the most successful is the use of low-cost radar technology in combination with signage. Known by a variety of names including radar speed signs, speed reader boards, driver feedback signs and “Your Speed” signs, these traffic-calming hybrids can be permanently mounted like any other traffic sign, or they can be attached to a trailer and moved from one location to another. All speed reader boards tell drivers their actual speed as they pass by. Some flash warnings when speeds reach a preset limit.

In a recent national survey, traffic engineers and other safety professionals ranked driver feedback signs as the most effective traffic-calming method for neighborhoods and school zones. Researchers suggest that the sign’s effectiveness is due to the fact that, unlike static speed signs that are often ignored, feedback signs refocus driver attention on his/her own speed rather than on their personal evaluation of driving conditions.

Interestingly, research also indicates these calming devices continue to slow traffic even after they become long-standing fixtures at a location. A study published by the Transportation Research Board in Washington, called the Comparative Study of Speed Reduction Effects of Photo-Radar and Speed Display Boards, showed that almost the same speed reduction was being achieved four months after installation.

One possible obstacle to the implementation of radar speed signs is that they require power to operate. To address this issue, portable units use rechargeable batteries or solar power. Permanently installed units need to access power from the grid or must be solar-powered. Fortunately, today’s technologies make solar-powered units viable in most locations within the United States.

Need to Decrease Speed? Do Your Due Diligence Now

Considering the dramatic impact that even a small reduction in traffic speed has on pedestrian safety, traffic-calming initiatives remain a high priority among safety professionals. Finding the best solution requires an adequate understanding of the individual case and then deploying a strategic program that properly addresses all of the issues involved. Armed with a variety of traffic-calming tools and a thorough understanding of each, a strategic traffic-calming program can have a real impact on increasing pedestrian safety.

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