

### INTRODUCTION

Higher vehicle speeds are strongly associated with a greater likelihood of both a pedestrian crash and serious pedestrian injury. A 1999 National Highway Traffic Safety Administration study found that 5 percent of pedestrians are fatally injured when struck by a vehicle traveling at 20 mph or less. This compares with fatality rates of 40, 80, and nearly 100 percent when the pedestrian is struck at 30, 40, and 50 mph or more, respectively.<sup>1</sup>

Tools used to reduce vehicle speeds in school zones include police enforcement (for example, conventional, automated speed cameras, double fines), public awareness campaigns, and engineering countermeasures. Traffic engineering tools include school speed limit zones and traffic calming (see ITE Briefing Sheet—*The Use of Traffic Calming Near Schools*).

### SCHOOL SPEED ZONES

Many parents and school and community groups request that the school speed limit be reduced by the greatest possible extent, with the expectation that motorists will obey the posted speed limit. A limitation of school speed limit zones is that the posted speed limits, even when combined with flashing lights, do not always result in the desired low operating speeds. Research shows that the measured 85th percentile speed is about 5 to 7 mph higher than the posted school speed limit (see Figure 1.).<sup>2</sup> So while a school speed limit zone does have lower speeds, drivers still exceed the posted school speed limit.

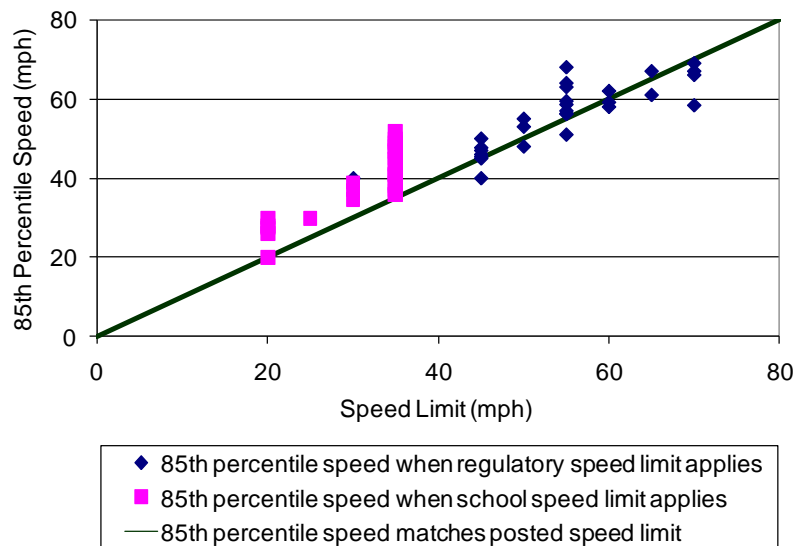


Figure 1. Measured 85th percentile speeds for school sites in Texas when reduced school speed limits are and are not active.<sup>2</sup>

Principal questions with reduced school speed limits include:

- Should speed limits be reduced for the school?
- What limit should be selected for the reduced school speed limit?
- Where should the reduced school speed limit zone begin and end?
- When should the reduced school speed limit be in effect?

The answers to these questions vary widely between states and individual jurisdictions. In many cases, some of these issues are settled by state statute or local ordinance. In the absence of state or local requirements, a jurisdiction should establish uniform procedures for considering the need for and the implementation of school speed limit zones.

### Should Speed Limits Be Reduced for the School?

The evaluation process needs to measure existing speeds on the street in question during school hours and determine whether speeds are higher than desired. The evaluation process should consider whether other actions might bring about the desired results more effectively.

A school speed limit zone typically is considered when children are crossing a roadway going to and from school. The zone may be considered on any street along the school frontage.

In some regions, school speed limit zones are generally not used when signalized or stop-controlled intersections are present at the school crossings, because their traffic control creates gaps that children can use to cross a roadway. A school speed limit zone may be installed or retained at a roundabout, at a signalized or stop-controlled intersection (for example, as a mitigation measure for concerns related to sight distance), or in other situations as determined by an engineering study.

Reasons for reducing operating speeds in school zones are that children have difficulties with the following:

- Seeing and evaluating traffic conditions because of their height;
- Processing information because of their limited peripheral vision and visual acuity;
- Perceiving correctly the direction and sound of traffic; and
- Understanding the use of traffic control devices and crosswalks.

### What Speed Limit Should Be Selected for the School Zone?

The value used for the reduced school speed limit varies. In some states, the value is constant for all reduced-speed school zones. For example, in the U.S. state of Arizona, all school zones are signed for 15 mph. In other locations, the value is determined on a case-by-case basis. In other states, the reduced school speed limit shall not be more than 30 mph below the established speed limit and shall not be lower than 15 mph.<sup>3</sup> Suggested values from Texas<sup>4</sup> for a school speed limit are listed in Table 1.

**Table 1. State of Texas suggested school speed limit based on 85th percentile speed.<sup>4</sup>**

85th Percentile Speed*	Suggested School Speed Limit
Below 55 mph	Not more than 15 mph below 85th percentile speed or posted speed. Not to exceed a 35 mph school speed limit.
55 mph	20 mph below the 85th percentile speed or posted speed.
Greater than 55 mph	Use buffer zone to transition to a 35 mph school speed limit.
*85th percentile speed is the speed at or below which 85 percent of the motor vehicles travel.	

Speed studies provide a sound basis for selecting the proper speed limits for school zones. While it is not common practice to set speed limits significantly lower than the 85th percentile speed for regulatory speed zones, exceptions to this practice are often found in school zones.

Factual studies, reason, and sound engineering judgment, rather than emotion, should govern the final decision on the maximum deviation from the 85th percentile speed that will provide a reasonable and prudent school speed limit.

### Where Should the School Speed Limit Zone Begin and End?

In some states, the start and end of the school speed zone are established by state law. The *Manual on Uniform Traffic Control Devices* (MUTCD) states that the beginning point of a reduced school speed limit zone should be at least 200 ft. in advance of the school grounds, a school crossing, or other school-related activities. This 200-ft. distance should be increased, however, if the reduced school speed limit is 30 mph or higher. Researchers<sup>2</sup> suggest the beginning of the school speed limit zone be based upon the school speed limit as follows:

**Table 2. Suggested beginning of school speed limit zone**

School Speed Limit (mph)	Distance to Crosswalk or First Driveway (ft.)
20	200
25	200
30	300
35	400

The location of the beginning and end of a school speed limit zone should be based on engineering judgment rather than the exact location of the school property line or fence. The school speed limit zone should be centered at the location(s) where children cross the roadway. The beginning and ending points should be selected with appropriate consideration for the location of other traffic control devices and/or features that could affect the effective implementation of the school speed limit zone. In some states the start or end of a school speed limit is set by state law.

School speed limit zones in urban areas where speeds are 30 mph or less may have school zones as short as 400 ft. School speed limit zones in rural areas where regulatory posted speeds are typically 55 mph or more will have longer school zones. The suggested length of school zones in rural areas is 1,000 ft.

Research<sup>2</sup> has shown that speeds are approximately 1 mph higher for every 500 ft. driven within a school zone; therefore, longer school zones are associated with greater speed variability within the zone.

### When Should a Reduced School Speed Limit Be in Effect?

Generally, the reduced school speed limit zones should be in effect only during specified intervals such as at the start and end of a school day. While the transportation agency responsible for the roadway operations and maintenance installs the signs, the times are generally set through consulting with the local school district. Close cooperation is needed between school officials and those who operate the roadway.



Figure 2. Example of school speed limit sign. Source: Aliyah N. Horton

In some locations, the intervals of operation of the flashing beacons (if used) on the school speed limit assemblies may be extended or revised for school events, as agreed upon by the school district and the entity responsible for operating the flashing beacons. In this case, the flashing beacons should be in operation only when there is an increase in vehicular activity and/or pedestrian or bicycle traffic in and around the roadway associated with the school event.

Research<sup>2</sup> has also shown that operating speeds in an active school speed limit zone are at their lowest close to the start time or end time of the school day. Approximately 20 minutes past these times, the speed increases 1 mph. Automated flashers (example shown in Figure 2) used with reduced school speed limit assemblies must be coordinated with school officials for half-day sessions and early release to ensure that the reduced speed is in effect during school crossing times. Local traffic officials need to coordinate with school officials each year to ensure that the traffic control plans fit the school arrival and dismissal schedule.

### REFERENCES

1. National Highway Traffic Safety Administration. *Literature Review on Vehicle Travel Speeds and Pedestrian Injuries*. Washington, DC, USA :NHTSA, 1999. <http://www.nhtsa.gov/people/injury/research/pub/hs809012.html>.
2. Fitzpatrick, K., M.A. Brewer, K.O. Obeng-Boampong, E. Park., and N.D. Trout. *Speeds in School Zones*. Report No. 0-5470-1. College Station, TX, USA: Texas Transportation Institute, 2009.
3. Minnesota Department of Transportation (Mn/DOT). *School Zone Speed Limits*. Mn/DOT. Accessed November 30, 2011. <http://www.dot.state.mn.us/speed/schoolspeedlimits.pdf>.
4. Texas Department of Transportation (TxDOT). *Procedures for Establishing Speed Zones*. TxDOT, 2011. Accessed November 30, 2011. [http://onlinemanuals.txdot.gov/txdotmanuals/szn/manual\\_notice.htm](http://onlinemanuals.txdot.gov/txdotmanuals/szn/manual_notice.htm).