Safe Routes to School Briefing Sheets

The Use of Traffic Calming Near Schools

INTRODUCTION

Parents often cite high vehicle speeds and traffic volumes as reasons for not allowing their children to walk or bicycle to and from school. Calming traffic through the application of engineering tools can encourage drivers to reduce their speeds. At lower operating speeds, drivers are better able to react in time to avoid collisions (see Figure 1). This is particularly important around children, who may behave erratically or may not be alert to traffic. "Traffic calming" is the installation of physical measures that alter driver behavior and improve conditions for nonmotorized street users. More specifically, traffic calming objectives include:

- Achieving slow speeds for motor vehicles;
- Reducing collision frequency and severity;
- Increasing safety and the perception of safety for pedestrians and bicyclists;
- Reducing the need for police enforcement;
- Enhancing the street environment (for example, streetscaping);
- Increasing access for all modes of transportation; and
- Reducing cut-through motor vehicle traffic.

This briefing sheet focuses on physical changes to roadways to achieve traffic calming, specifically to achieve improved safety and accessibility for pedestrian and bicycle routes implemented through Safe Routes to School (SRTS) programs. Such changes are generally more self-enforcing than traditional education and enforcement efforts, offer long-term benefits, and usually do not require continued intervention.

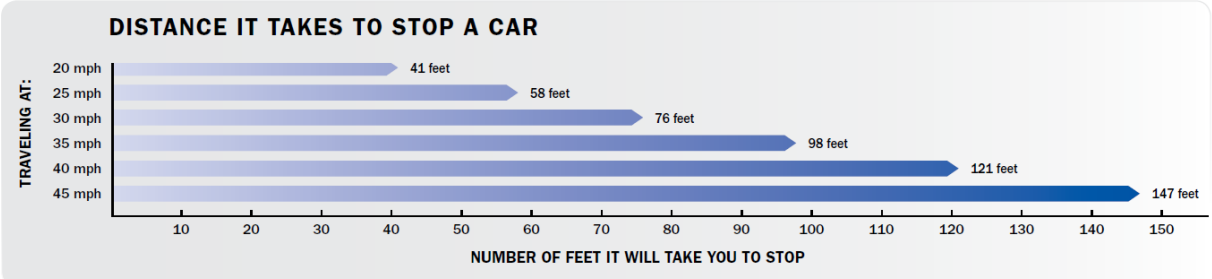

Figure 1. Travel Speed vs. Reaction and Braking. Source: Street Smarts Marin, Transportation Authority of Marin

COLLABORATIVE PLANNING

Participants in a SRTS walking and bicycling audit may identify the need for traffic calming to enhance driver compliance with existing school speed-limit zones and traffic controls (see ITE Briefing Sheets—*Walking and Bicycling Audits, Reduced School Area Speed Limits*, and *School Area Traffic Control*). Transportation professionals should work closely with SRTS committees and the neighboring community to categorize existing issues and identify potential traffic calming solutions.

Many jurisdictions have developed "toolboxes" of traffic calming measures appropriate for their school areas.[1] The toolbox provides descriptions of the various applicable traffic calming measures, as well as their potential advantages and disadvantages, and cost. When selecting appropriate measures, planners and engineers should consider potential

[1] The Institute of Transportation Engineers (ITE) Traffic Calming Library provides information and research about a range of treatments: www.ite.org/traffic/.

consequences, including diverting traffic onto other streets, impeding emergency or transit vehicles, or reducing access to private homes.

TRAFFIC CALMING MEASURES AROUND SCHOOLS

A wide range of traffic calming measures may be used alone or in combination near school zones to address vehicular speeds and/or volumes. The design of these measures should take into account how they would impact pedestrians and bicyclists, emergency response times or routing for transit vehicles, neighborhood access, drainage, and snow removal where appropriate. All measures should be properly designed, with appropriate spacing and use of signs, striping, lighting, and vertical elements where necessary to improve visibility.

The following traffic calming measures can be used to reduce travel speeds near schools:

Figure 2. Curb Extension. Source: www.pedbikeimages.org/Dan Burden

Curb extensions

Curb extensions are installed to reduce the roadway width from curb to curb at an intersection, shortening the crossing distance for pedestrians and making it easier for motorists to see pedestrians. Also known as bulbouts and neckdowns, curb extensions extend through the parking lane but should not narrow the travel lane or impede bicyclists on a bike route.

Chicanes, lateral shifts, and chokers

These all consist of road narrowings installed at non-intersection locations to create a narrow two-lane gap or a single lane. Chicanes are a type of lateral shift that requires traffic to move from side to side of the street in order to create an S-shaped travel path. Chokers are midblock curb extensions that narrow the street by expanding the sidewalk or adding a planting strip, and often are installed at midblock crossings. These features can compromise on-street parking and bus access, and may have limited application near schools.

Speed humps

Speed humps are raised sections of pavement placed across the street to force motorists to reduce speeds. While they are effective in reducing traffic speeds and are relatively low cost, speed humps may be controversial in some localities due to their appearance, and potential jarring effects on vehicles and passengers.

Speed tables and raised crosswalks

Speed tables are similar to speed humps, except they include a flat section on top, sometimes constructed with a decorative surface material. Raised crosswalks are speed tables marked as a pedestrian crossing, which allows pedestrians to cross without stepping down and up between the curb and the road. Truncated domes should be used to demarcate the transition for pedestrians with vision impairments. Speed tables permit slightly higher motorist speeds and smoother transitions than do speed humps.

Figure 3. Raised crosswalk through school parking lot. Source: Alta Planning + Design

Raised intersections

A raised intersection refers to a roadway intersection entirely elevated to sidewalk level. Raised intersections are designed with ramps for the vehicles and may include decorative surface materials on the flat, raised section. Since raised intersections are usually the same height as the sidewalk, they create a nearly seamless transition with sidewalks and crosswalks, which are demarcated with truncated domes. Issues associated with raised intersections include drainage, motorists turning across the sidewalk area at corners, and the ability to communicate the edge of the roadway to vision-impaired pedestrians.

Neighborhood traffic circles/mini traffic circles

Mini traffic circles are often located on lower-volume residential streets, where traffic is required to circulate counterclockwise around a center island, slowing entering and exiting drivers.

Approaches to neighborhood traffic circles are sometimes controlled by YIELD or STOP signs but in some cases are not controlled due to low speeds and volumes at these intersections.

Modern roundabouts

Roundabouts are a type of circular intersection defined by three basic operational principles: 1) geometry that results in a low-speed environment, 2) entering traffic yields to vehicles in the circulatory roadway, and 3) channelization at the entrance and deflection around a center island are designed to be effective in reducing conflict. Proper site selection, channelization, and design features are essential for making roundabouts accessible to all users, including student pedestrians and cyclists. Modern roundabouts are recognized by FHWA as a proven countermeasure.

Traffic calming that primarily controls traffic volume restricts certain vehicular movements. Bicycle and pedestrian access should be maintained through these measures. The following traffic calming measures can be used primarily to control traffic volumes:

Half-street closures

Half-street closures block one side of the street at an intersection so that one direction of traffic is diverted to another route. In the context of SRTS, they may be used to reduce high volumes of through traffic in the vicinity of schools or along a school route. Half-street closures are often called partial closures or one-way closures. They are constructed using the same materials and designs as full closures but may not require a turnaround. Some enforcement and neighborhood outreach may be needed to obtain neighborhood approval and promote compliance. While half-street closures provide emergency access for fire trucks and ambulances, consideration must be given to the effect they may have on school bus routing, sanitation pickup, and mail delivery routes.

Median islands

Median islands are raised islands located in the middle of a street that continue across an intersection, preventing cut-through motor vehicle traffic at a cross street. Median islands also block left-turning motorists off the main street, which reduces conflicts with pedestrians crossing the main street. Wide median islands may also serve as a pedestrian refuge, providing a safer two-stage crossing where pedestrians need to focus only on traffic coming from one direction at a time. Median islands are recognized by FHWA as a proven countermeasure.

Forced-turn islands

Forced-turn islands are also called forced-turn channelizations, pork chops, or right-turn islands. They require traffic to turn at an intersection and can prohibit drivers from turning into the side street.

ADDITIONAL RESOURCES

Traffic calming can play a key role in creating safe routes to school by reducing vehicle speeds and volumes and creating a comfortable and attractive neighborhood bicycle and pedestrian environment. The measures previously described are just a few examples of many available traffic calming tools. Numerous resources identify various traffic calming tools and their advantages, disadvantages, and cost. Examples include the following:

- National Center for Safe Routes to School: guide.saferoutesinfo.org/engineering/slowing_down_traffic.cfm
- Institute of Transportation Engineers: www.ite.org/traffic/
- Pedestrian and Bicycle Information Center: www.walkinginfo.org/engineering/calming.cfm
- Federal Highway Administration: www.fhwa.dot.gov/environment/sidewalk2/sidewalks209.htm
- Canadian Guide to Neighbourhood Traffic Calming: www.ite.org/traffic/tcstate.asp#cgntc
- U.S. Traffic Calming Manual: www.planning.org/media/trafficcalming/
- FHWA Proven Safety Countermeasures: http://safety.fhwa.dot.gov/provencountermeasures/

REFERENCES

- National Center for Safe Routes to School: www.saferoutesinfo.org/
- Institute of Transportation Engineers: www.ite.org/traffic/
- Federal Highway Administration: www.fhwa.dot.gov/environment/sidewalk2/sidewalks209.htm
- Parisi Associates, Transportation Tools to Improve Children's Health and Mobility, 2004. http://www.dot.ca.gov/hq/LocalPrograms/TransportationToolsforSR2S.pdf
- Pat Noyes, Traffic Calming Transportation Tech Sheet for Congress for New Urbanism. http://www.cnu.org/sites/www.cnu.org/files/CNU_Traffic_Calming.pdf