Transportation Professionals Get Involved with Safe Routes to School

SAFE ROUTES TO SCHOOL PROGRAMS AIM TO PROMOTE WALKING AND BICYCLING TO AND FROM SCHOOL AND IMPROVE TRAFFIC SAFETY THROUGH EDUCATION, INCENTIVES, LAW ENFORCEMENT AND ENGINEERING MEASURES. SUCCESSFUL PROGRAMS REQUIRE THE INVOLVEMENT OF TRANSPORTATION PROFESSIONALS—THE EXPERTS A COMMUNITY TURNS TO FOR TECHNICAL ADVICE AND IDENTIFICATION OF FEASIBLE ENGINEERING SOLUTIONS.

BY DAVID PARISI, P.E. AND BRETT HONDORP

DID YOU WALK OR RIDE A bicycle to school? Chances are that you did. Thirty years ago, the sight of children walking or bicycling to school was common—66 percent of all children did so. Now, however, 87 percent of all trips to and from school are made by car or bus.[1]

Safe Routes to School (SR2S) provides some solutions to reverse this generational shift. It is a growing movement that integrates health, fitness, traffic relief, environmental awareness and safety goals into one program, with transportation professionals playing a key role.

SR2S refers to a variety of multidisciplinary programs aimed at promoting walking and bicycling to and from school and improving traffic safety through education, incentives, increased law enforcement and engineering measures. SR2S programs typically involve partnerships among municipalities, school districts, community and parent volunteers, law enforcement agencies and transportation professionals.

Studies in a number of communities developing SR2S plans have shown that parents driving their children to school generate 20 to 30 percent of morning automobile traffic. Parents cite a number of reasons for driving their children to and from school (see Figure 1). This increase in driving increases traffic congestion around schools, prompting even more parents to drive their children due to fears about their safety.

Reversing this trend requires a comprehensive approach to improving safety along routes to and near schools. Engineering measures are a central part of the solution. Although the focus is on school areas, SR2S programs address issues that can improve quality of life for entire neighborhoods and communities—improving safety for pedestrians and bicyclists, reducing traffic speed and congestion and increasing physical activity and health.

HOW SAFE ROUTES TO SCHOOL BEGAN

Although planning and engineering around school zones is not new for transportation professionals, comprehensive SR2S programs have only recently become prevalent in the United States. The movement has its roots in Europe.

The first national SR2S program began in Denmark in 1976. A pilot program was implemented in the City of Odense to address a growing child pedestrian accident rate. The City implemented a number of engineering improvements including a network of pedestrian and bicycle paths, established slow speed areas, narrowed roads and installed traffic islands, which resulted in an 85-percent reduction in traffic injuries to children.

Subsequent large-scale programs in Great Britain and Canada in the 1990s also were successful in reducing child pedestrian and bicyclist injury accident frequency and encouraging more children to walk and bike to school.

In the United States, a national SR2S program began in fall 2000 when the National Highway Traffic Safety Administration (NHTSA) awarded demonstration project grants to Marin County, CA, USA and Arlington, MA, USA. Both pilot programs were successful in increasing the number of children walking and bicycling to school regularly (see Figure 2).

Since then, SR2S has grown rapidly in the United States, with scores of programs enacted in communities of all sizes, ranging from comprehensive citywide efforts to single school improvement plans. The popularity of SR2S continues to grow—some states are piloting their own programs and others have established dedicated SR2S funding for implementing capital projects.

THE SR2S TASK FORCE

Successful SR2S programs begin by bringing in all the interest groups that have a stake in program outcomes. The

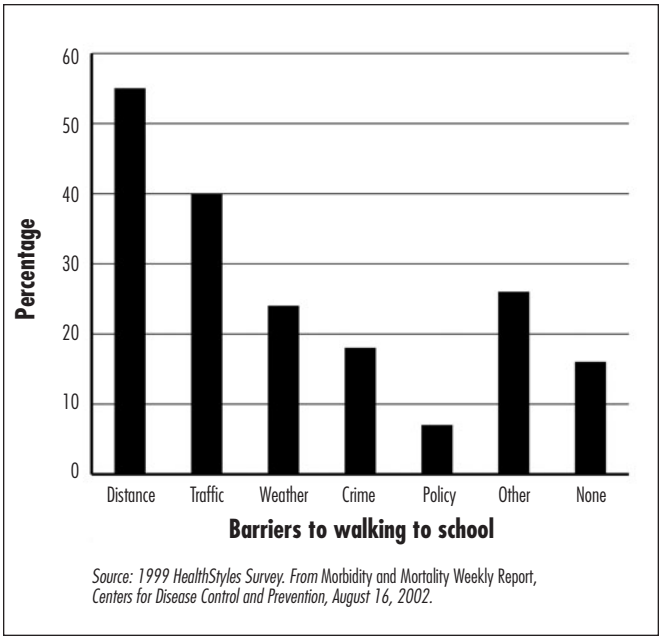

Figure 1. Parents rank traffic dangers second out of reasons why their children do not walk or bicycle to school, ahead of weather and crime.

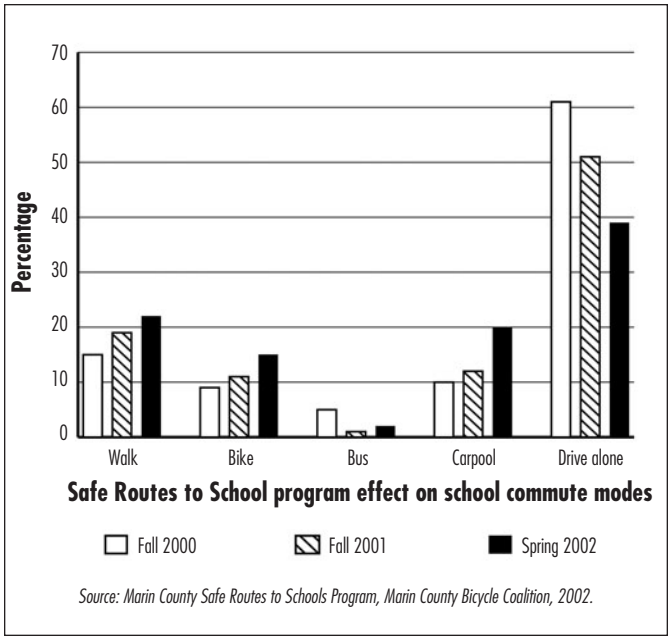

Figure 2. The Safe Routes to School program in Marin County, CA, USA, successfully increased walking, bicycling and carpooling trips to school over a 3-year period.

role of transportation professionals is critical—they are the experts a community will turn to for technical advice and identification of feasible engineering solutions.

The effort should begin with the formation of a SR2S task force, consisting of parents, children, teachers, principals and neighbors of a single school. City officials, including transportation professionals, also are important partners because they can help provide resources, are effective in building community support and are influential in developing policies to improve bicycling and pedestrian travel facilities.

The first job of a transportation professional in this process is to listen. Because school commute routes are highly local in nature, SR2S efforts require extensive local input to evaluate walking and bicycling patterns and conditions. From the beginning, the process should involve parents and neighbors—they are the adults who will be most affected by the outcome of the program and whose participation is most needed to guarantee its success.

Students also should be active participants in the planning process. Children provide a unique and important outlook on aspects of the transportation environment and can identify shortcuts and route details that never would occur to adults.

Figure 3. A Safe Routes to School task force conducts a field audit of street and school route conditions.

CONDUCTING A COMMUNITY AUDIT

One of the best ways for a transportation professional to gain input from task force members is to participate in a community audit of the school area. This is a chance to join stakeholders in walking, bicycling, or driving a variety of routes to school and to identify street, intersection, sidewalk and bikeway conditions, observe pick-up and drop-off operations and map out the primary routes used by children (see Figure 3).

By collecting baseline information and creating a snapshot of current travel behaviors, the transportation professional can advise the task force on key issues and hot spots. It often takes parents and children to identify the real issues, so this opportunity should be used to work closely with the task force.

During the community audit, photographs should be taken to document key issues and concerns. Key features should be noted:

- Are sidewalks and pathways continuous along the route? Are they in good condition?
- Are crosswalks and pedestrian signals present at busy streets and intersections?
- Are curb ramps present?
- Are utility poles or other obstacles blocking the sidewalk?
- Is there sufficient width for bicycles along the route?
- Is secure and convenient bicycle parking available at the school?
- Are sufficient sight distances and visibility provided, especially for pedestrians less than 5 feet tall?
- Are there adequate and visible signing and pavement markings?
- Are crossing guards present?

THE SR2S TOOLBOX

Once safety problems have been identified, the transportation professional should work with the task force to develop a SR2S improvement plan for addressing issues such as speeding traffic, dangerous intersections, unsafe bicycle facilities and missing crosswalks or sidewalks. A menu of solutions is possible. Successful SR2S programs depend on a toolbox comprising four Es: education, encouragement, enforcement and engineering.

- Education trains motorists and child pedestrians and bicyclists about their rights and responsibilities.
- Encouragement provides children with incentives to walk or bicycle more frequently, such as classroom contests and prizes.
- Enforcement increases awareness and reduces the frequency of traffic safety problems.
- Engineering approaches improve walkways and bikeways, provide better connections and reduce vehicle speeds.

Most successful SR2S programs are comprehensive efforts that involve implementing elements of all four Es. Although some problems related to school routes can be reduced or alleviated through education, encouragement, or enforcement measures alone, in many cases, engineered improvements are necessary for enhancing safety and increasing the number of children that decide and are permitted to walk and bicycle to school. More visible and higher profile engineering improvements also can serve as the "carrot" to entice parents to work diligently as volunteers, making the other three Es more successful.

SR2S engineering measures usually focus on three areas: 1) improving paths and sidewalks; 2) providing better connections and crossings; and 3) reducing vehicle travel speeds. The remainder of this feature focuses on various engineering tools available to transportation professionals to improve school commute safety.

IMMEDIATE AND LOW-COST ENGINEERING SOLUTIONS

Low-cost engineering solutions can make a big difference in improving walking and bicycling routes to school. Many infrastructure improvements require substantial time for implementation—sometimes requiring years to raise funds, gain community input and complete final design and construction.

It is important for the SR2S task force to inventory resources and determine what engineering solutions can be accomplished in just a few months. Many low-cost engineering measures should be considered and can be implemented in a relatively short time to improve routes to school.

Repair Sidewalks and Pathways and Remove Obstacles

Repairing uneven or missing sidewalk segments and removing obstacles and encroachments can keep children on the sidewalk and out of the street. Removing obstacles also can improve sight distance for motorists pulling out of driveways or side streets and can reduce potential conflicts. The solution may be as simple as educating residents to trim shrubs and place garbage cans and recycling in the street instead of on the sidewalk.

Provide High-Visibility Crosswalks

The visibility of crosswalks can be enhanced through the use of reflective paint or thermoplastic. High-visibility striping patterns such as zebra, ladder, triple four, or diagonal configurations also can improve crosswalk recognition. Some states designate school area crosswalks in yellow. Supplemental school crosswalk signing always should be considered (see Figure 4).

Improve School Area Signing

The *Manual on Uniform Traffic Control Devices* (MUTCD) provides for a number of signage assemblies for use around school

Figure 4. A high-visibility crosswalk, school crosswalk warning assembly and in-street pedestrian sign are implemented in Santa Barbara, CA, USA.

Figure 5. More than 30 driver speed feedback signs have been permanently installed near schools in San Jose, CA, USA.

areas, including the school advance warning assembly, school crosswalk warning assembly, school speed assembly and school bus stop. MUTCD allows the option to use fluorescent yellow-green background color for all school warning signs, provided this color is used systematically for all signs within an area.

Consider Use of New Signing Techniques

In-street pedestrian crosswalk signs, also included in MUTCD, often are effective for alerting motorists about uncontrolled school area crosswalks. Some SR2S programs claim that these mobile signs are most effective when deployed solely during school commute periods, usually by school personnel or crossing guards. Permanently installed changeable message speed limit signs that read "YOUR SPEED XX" also are useful in school zones (see Figure 5).

Expand the size of the school zone: MUTCD allows for the placement of a school advance warning sign up to 700 feet from school grounds. Expanding the size of the school zone permits a larger area for warning signage and enforcement of the school area speed limit. Some states have instituted double-fine zones for traffic violations within school zones.

Install pavement legends: Pavement markings such as SCHOOL, SLOW SCHOOL XING, or XX MPH (school area speed limits vary by state), can help alert motorists to school zones, lower speed limits and school crossing locations. Installing advance limit lines approximately 5 feet in front of crosswalks will show motorists where to stop.

Modify traffic signal phasing or timing to improve pedestrian crossings: Providing additional walk time at intersections with heavy school pedestrian traffic can account for children's slower crossing times. Including an "early release" to give pedestrians a brief WALK signal before the traffic light turns green gives children a head start in crossing the street and increases motorist awareness. Providing turning motorists with a flashing yellow arrow during actuated pedestrian crossings also improves driver attentiveness.

Develop school walking and bicycle route maps: These maps can serve as both a resource for transportation professionals and an encouragement tool for parents and children. School route maps should show basic physical information—the location of traffic signals, stop signs, crosswalks and crossing guards—as well as potentially hazardous locations along the route. The maps also should use arrows to direct students to the most appropriate route to school. For transportation professionals, the maps develop uniformity in the use of school area traffic controls and point out needed improvements, such as missing sidewalks.

Modify drop-off/pick-up operations: In some cases, changing drop-off/pick-up operations can improve walking and bicycling safety without any major changes to infrastructure. Methods to provide better separation of pedestrian/bicycle and vehicle traffic and to reduce potential conflicts include designated drop-off/pick-up lanes, operating vehicle platoons and student valet unloading/loading. The use of plastic cones, temporary signs, curb paint and school volunteer attendants to direct children in loading/unloading areas can be effective and can eliminate the need for expensive modifications to parking or loading areas.

Hold regular traffic safety days. These special events are intended to alert parents and other motorists about the importance of pedestrian and driver safety in school areas and to encourage children to walk or bicycle. Participants should include school officials, parents, police and community volunteers. Transportation professionals can assist by monitoring crosswalks and roadways to observe traffic, parking, or other safety problems.

HIGHER-COST ENGINEERING MEASURES

Low-cost measures can be useful in many situations. Sometimes, however, more extensive engineering is called for.

Separate pedestrian and bicycle facilities: In some cases, completely separating pedestrians and bicyclists from motor vehicle traffic is necessary. These projects can

be popular with parents because they provide the greatest measure of perceived safety. In California's SR2S capital grant program, new sidewalks and pathways are the most requested type of improvement project (see Figure 6). Pedestrian and bicycle bridges can increase safety near busy street crossings and shorten distances over creeks or other barriers between neighborhoods and the school.

Bicycle lanes: Although younger children often ride on the sidewalk, striping bicycle lanes can provide a dedicated and highly visible space for children to bicycle on streets and can help reduce bicycle/pedestrian conflicts on congested walkways. In Santa Barbara, CA, innovative time-of-day bicycle lanes near several schools are in effect only during school commute hours. During other periods, the bicycle lanes revert to on-street parking for resident use.

Crossing enhancements: A variety of improvements can be provided to enhance visibility and safety at pedestrian/bicycle crossings, including signalized crosswalks, flashing beacons, lighted crosswalks, raised crosswalks and crossing islands.

Traffic calming: Traffic calming tools can be effective in slowing vehicle speeds through a school area. Common solutions include curb extensions (which also shorten crossing distances), speed humps, speed tables, chokers and curb radius reductions.

Most longer-term infrastructure-related improvements usually require additional funding and could be incorporated into the jurisdiction's capital improvement plan.

SAFETY AND SECURITY

Even with traffic safety problems addressed through the implementation of these engineering measures, parents still may not let their children walk to school due to fears about personal safety. The perception of "stranger danger" is a strong deterrent to increasing walking and bicycling by children. This problem can be addressed in a number of ways.

As part of any educational program on walking or bicycling to school, children should be instructed on how to interact with strangers. Beyond education, the best solution often is to encourage children to walk in a group or be escorted by a parent volunteer. The "walking school bus" concept, where a group of children walk together and pick up other children along the route, can be very successful. It also can apply to bicycling ("bike train"). A parent volunteer to chaperone students to and from school can make the difference for many parents deciding whether to allow their children to walk or bicycle.

Figure 6. A new school pathway in Mill Valley, CA, USA, was funded through the California Safe Routes to School capital grant program.

FUNDING OPPORTUNITIES

A number of states recently have dedicated SR2S funding sources to assist in implementing capital improvements. California's SR2S program dedicates $20 million to $25 million per year. In Texas, $5 million was available last year for SR2S construction projects. Other states with developing SR2S funding programs include Delaware, Colorado, Massachusetts, New Jersey, Pennsylvania and Oregon.

As part of the reauthorization of the Transportation Equity Act for the 21st Century, both houses of the U.S. Congress have passed transportation funding bills that establish specific SR2S programs and include dedicated funding. Both SR2S programs provide funding for a variety of infrastructure projects near schools as well as educational and encouragement programs. The final funding levels and provisions of this federal SR2S program will be worked out as the House and Senate reconcile a final version of the transportation funding bill in 2005.

GET INVOLVED

The engineering of safer neighborhoods is a critical component of the SR2S movement. The toolbox of solutions includes many low-cost engineering measures that can be implemented relatively quickly—signage, crosswalks, pavement markings and sidewalk and pathway fixes—as well as more expensive infrastructure improvements to provide separate pathways and calm traffic in school zones.

As members of the SR2S team, transportation professionals are the experts that a community will turn to for identifying safety problems and developing feasible solutions. This participation is important, not just as an engineer or planner, but also as a parent, neighbor and community member.

FOR MORE INFORMATION

A comprehensive Web-based SR2S resource guide is provided by the National Center for Bicycling and Walking at www.bikewalk.org/safe_routes_to_school/SR2S/resources.htm. The Web site includes information on SR2S activities, case studies, data sources, community audits, legislation and other resources.

For additional information on engineering-based tools for creating safe routes to school, see NHTSA's "Safe Routes to School Toolkit" (accessible via www.nhtsa.dot.gov/people/injury/pedbimot/bike/saferouteshtml/toc.html) and the Local Government Commission's "Transportation Tools to Improve Children's Health and Mobility" (accessible via www.lgc.org/freepub/land_use/factsheets/child_transp_tools.html). ■

Reference

1. "1995 National Personal Transportation Survey." Federal Highway Administration, December 1999.

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