Creating a Citywide Safe Routes to School Program: Pasadena, CA, USA's Step-by-Step Approach

IN 2005, THE CITY OF PASADENA, CA, USA, INITIATED DEVELOPMENT OF A COMPREHENSIVE SAFE ROUTES TO SCHOOL PROGRAM. THE EARLY GOALS OF THE PROGRAM WERE TO DEVELOP SUGGESTED ROUTE MAPS FOR 19 ELEMENTARY AND MIDDLE SCHOOLS; PREPARE NEW SCHOOL AREA TRAFFIC CONTROL PLANS FOR ALL SCHOOLS; AND IDENTIFY POTENTIAL STUDENT PEDESTRIAN AND MOBILITY ENHANCEMENT PROJECTS THROUGHOUT THE CITY.

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IN 2005, THE CITY OF PASADENA, CA, USA, with the support of consultants, initiated the development of a comprehensive Safe Routes to School (SRTS) program. The early goals of the program were to develop suggested route maps for 19 elementary and middle schools; prepare new school area traffic control plans for all schools; and identify potential student pedestrian and mobility enhancement projects throughout the city.

An ambitious project completion schedule was set for these tasks to capture school, student and parent interest and to design and construct projects so that they met funding obligations.

SIGNAGE AND PAVEMENT MARKING INVENTORY

Prior to the inception of the SRTS program, hand-drafted, CAD-based location maps were used for each of the public and private schools within the city. The maps depicted schematic inventories of traffic control devices, signage and pavement markings in the proximity of each school. These maps were used to generate routine work orders for sign and striping modifications around the schools.

However, the CAD maps had not been recently updated, and the transportation department had since moved to a geographic information systems (GIS) base for its transportation mapping. Therefore, the first step of the SRTS program was to develop school location maps in a GIS format and conduct an updated inventory of existing school-area infrastructure.

Benefits to developing the maps in GIS format included the ability to integrate the features into the city's existing GIS files and to associate attributes to each individual feature (for example, all crosswalks within a school area can be labeled with that school's name). The main challenge to developing these maps in GIS was legibly symbolizing line features, specifically crosswalks and curb ramps, at the scales required to show entire school enrollment areas.

Field surveyors spent approximately two months conducting inventories of school and pedestrian-related infrastructure and evaluating walking routes at the 19 schools in the program. Specific items surveyed included:

- School area signage, including the School Advance Warning Assembly, School Crosswalk Warning Assembly, School Speed Limit Assembly and School Warning Assembly;
- Locations and condition of SLOW SCHOOL XING pavement stencils;
- School crosswalk locations, including color (school zone crosswalks in California are required to be yellow), style (transverse or ladder) and condition;
- Curb ramp presence/absence at each corner; and
- Locations of traffic signals and stop signs.

SUGGESTED WALKING ROUTE MAPS AND PARENT SURVEY

Once the updated GIS school location maps were created, the next step of the program involved the creation of suggested walking route maps for each school, based on the field inventory and known student walking patterns. The goal was to create maps that conveyed key pedestrian infrastructure information in a clear and visually compelling format that would be used by parents and their children in selecting a walking route to school. As with the signing and striping inventory maps, the suggested walking route maps were developed using the citywide GIS system.

The project team first researched walking route maps used in other cities to compare the different features and information conveyed and the various layout styles. After reviewing many of the black-and-white engineering type walking route maps in use in many other cities, the project team developed a unique template for Pasadena that included a logo and color symbols and showed land uses such as local parks and other nearby schools, which would be a likely destination for neighborhood children. The fact that the maps were to be posted on the city's Web site and e-mailed to schools as their main form of distribution allowed the use of color, although symbols were designed such that black-and-white reproduction still would be possible.

The aesthetic emphasis of these maps required additional work to transfer the GIS map outputs into a graphics software program to enhance some of the fonts, colors and line work, but the hope was that more visually appealing maps would be more likely to be used by parents and children than busy maps with superfluous information.

The maps show directional arrows along the recommended routes to walk to school from all streets and pathways within the school's enrollment boundary, along with key elements of the pedestrian and bicycle infrastructure. Crossings were a key factor in developing the suggested routes—the routes utilize marked crosswalk locations with existing traffic signals, all-way stop controls, or crossing guards.

An early draft set of the suggested walking route maps was distributed to each school for feedback from parents and students. An accompanying survey form asked parents about their children's mode of travel to school and their reasons for not walking or bicycling. The survey also provided space for parents to list any safety concerns or problem areas and suggest specific improvements that could make the child's walking or bicycling route safer (see Figure 1). The survey was provided in both English and Spanish. The survey results were used to refine the suggested walking routes and identify locations for further study for engineering improvements.

Based on the survey results, it was determined that district-wide, more than half the students were driven to or from school by their caregivers, with 61 percent of respondents driven to school (non-carpool) in the morning and 55 percent of respondents picked up from school (non-carpool) in the afternoon.

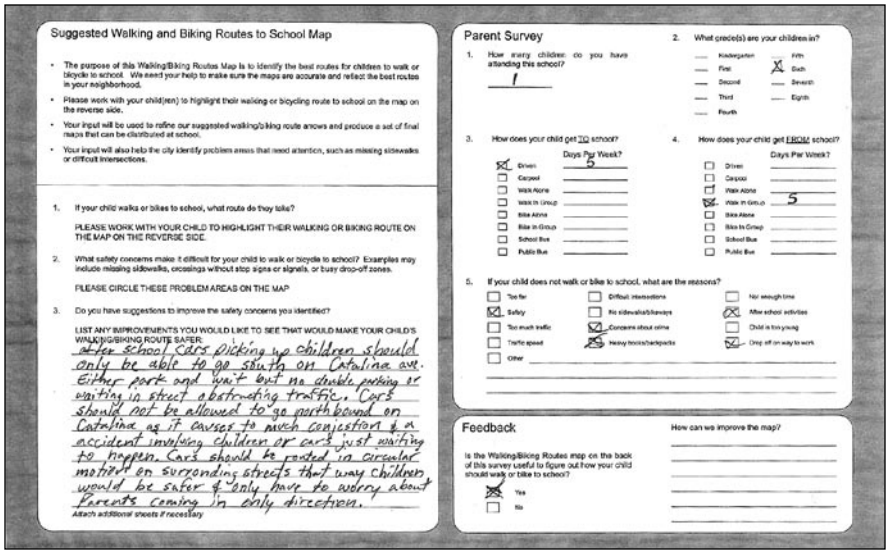

Figure 1. A completed parent survey form listing desired safety improvements. Forms were provided in both English and Spanish.

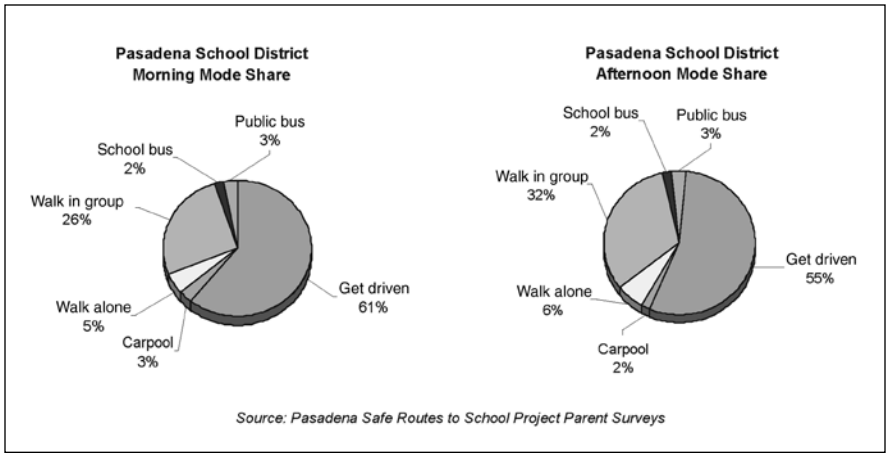

Figure 2. Although driving had the largest mode share during both commute periods, walking to school (either alone or in groups) totaled 31 percent in the morning and 38 percent in the afternoon.

Walking was the second most common method of traveling to and from school. More students walked home from school (38 percent) than walked to school (31 percent). Most students walked in groups; only 5 to 6 percent of respondents said they walked to or from school alone. The remainder of students either took the public bus (3 percent), the school bus (2 percent), or were in a carpool (2 to 3 percent). Very few respondents rode a bicycle to or from school (see Figure 2).

Concerns for safety, school distance and the young age of their child were the top three reasons parents did not let their child walk or bicycle to school. Parent recommendations to improve the safety of walking and biking included suggestions for additional traffic controls and crossing guards; a focus on reducing traffic speeds in the school zone; and increased police presence to improve the safety and security of walking children (see Figure 3).

One of the program's most time-consuming tasks was the distribution and outreach to the identified schools. City staff received approval from the Pasadena Unified School District to send each principal a letter requesting distribution and collection of 250 random maps with the

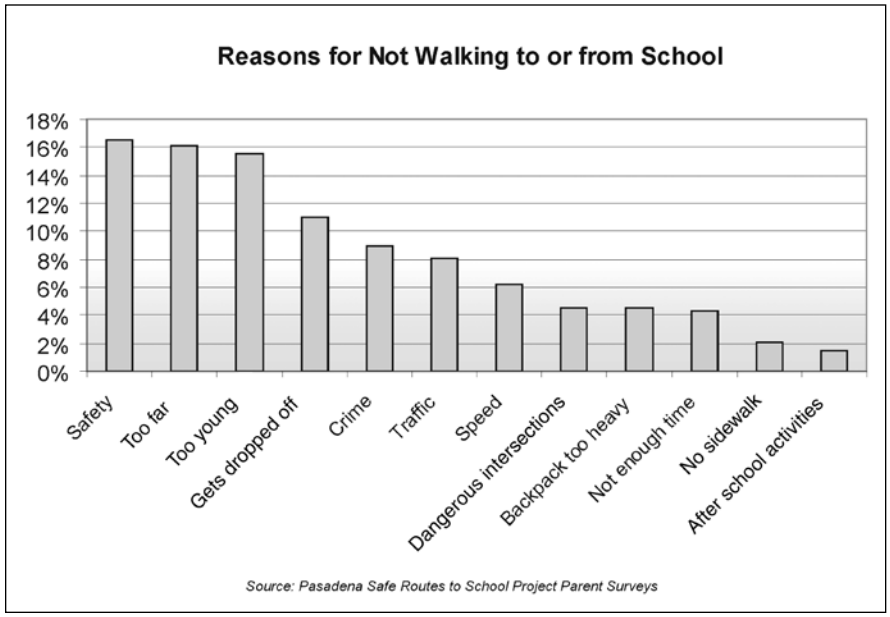

Figure 3. Safety, distance and the young age of the child were the top three reasons parents did not allow children to walk or bike to school.

accompanying survey. City staff hand-delivered the packages to principals and met with interested school personnel to discuss the intent of the program and solicit feedback for improvements.

Each of the schools responded differently in terms of their specific needs and concerns. Some provided limited feedback with low numbers of responses; some active school principals saw the value of the program, evidenced in a greater number of responses with significant constructive feedback. Ultimately, the schools that chose to invest the time received the most in terms of identified and constructed on-street improvements.

RECOMMENDATIONS

Based on recommendations from parent surveys, observations gathered during the signage inventory phase and problem areas known to city staff, a list of safety "hot spots" was developed and evaluated for potential improvements. Some of the identified locations studied were specific crossing locations; others were roadway corridors that encompassed more than one school.

A series of recommendations was developed to address the identified safety problems, including program and policy recommendations—broad categories of improvements or policies that would apply to many schools citywide—as well as an extensive list of school-specific engineering improvements.

One of the identified low-cost engineering recommendations was to ensure signage consistency within all school zones, at a minimum making sure that all signs complied with the California *Manual on Uniform Traffic Control Devices* (MUTCD) and were in good condition. At the time of the inventory, Pasadena had a mix of standard yellow and fluorescent yellow green (FYG) sign plates. The plan recommended that all future school area sign installations use a FYG background. The plan recommended a systematic approach to signage upgrades, using the GIS-based signage improvement plans showing current sign locations, California MUTCD code and condition and notes on whether the sign should be retained or replaced.

A unique element of the signage policies was a recommendation to use larger expressway size sign plates for school signage along arterial roadways. A number of Pasadena's schools front onto arterial roadways, and the school enrollment boundaries are such that many children cross these arterials to reach school. Because the arterial roads all had posted speed limits above 25 miles per hour (mph), the School Speed Limit Assembly was to be used, consisting only of the SCHOOL plate above the 25 mph Speed Limit When Children Are Present.

The relatively small size of the supplemental plate resulted in reduced visibility, especially on arterial corridors containing various other regulatory, parking and bus route signage. The larger expressway sign plate size, along with the FYG background, was recommended as a way to increase the visibility of these signage assemblies on arterial corridors.

Another policy recommendation focused on standardizing crosswalk striping. During field observations of the school areas, several different types of crosswalk striping patterns were observed, with no consistent application citywide. These included standard transverse striping, along with different ladder styles and different spacing of ladder markings.

MUTCD stresses the importance of applying uniform standards to school area signage and warning devices, noting that uniformity is "the best way to achieve reasonably safe and effective traffic control." A recommendation was made to the transportation department to establish a citywide standard for high-visibility crosswalk striping within school zones.

Enforcement and education recommendations were an important complement to the proposed design improvements. These programs increase awareness of walking and bicycling as means of transportation, emphasize pedestrian crossing safety and contribute to helping people make healthy lifestyle choices. Because the survey results indicated that concerns about traffic safety are a prime reason parents generally do not let their children walk or bicycle to school, it is important that these programs target not only students and their parents, but all drivers in Pasadena.

The City of Pasadena currently participates in a "Safe Strides and Rides" program sponsored by the California Office of Traffic Safety. The educational components of this program have included development of an educational video and procurement of equipment for bicycle rodeos to increase pedestrian and bicyclist safety awareness.

IMPLEMENTATION

Following completion of the plan report in 2006, which included a list of engineering recommendations for each of

Figure 4. Before and after photos of a lighted crosswalk installed at an intersection near a school.

Figure 5. Before and after photos at the mid-block crossing in front of a school showing new curb extensions and updated signage.

Figure 6. Before and after photos of updated signage, showing use of a larger expressway-sized speed limit plate for the arterial frontage and a FYG SCHOOL plate.

the 19 participating schools, implementation of the recommendation projects began. The City of Pasadena received a California Department of Transportation SRTS grant in the amount of $396,000. With a city match of $104,000, a project total of $500,000 was available to implement improvements around schools.

Following is a breakdown of the various components identified in the suggested routes to school program and constructed through the SRTS project:

- Sidewalk repairs and transit pads: included the installation of concrete for missing sidewalk segments along suggested walking routes and the installation of 20 Americans with Disabilities Act (ADA)–compliant transit access pads at bus stops that serve local schools.
- Access ramp construction: included the construction of 24 ADA-compliant access ramps focused on the primary intersections contiguous to school boundaries.
- In-roadway lighted crosswalks: for the installation of in-roadway lighted crosswalks at three locations where students cross at marked crosswalks at uncontrolled intersections (see Figure 4, showing before and after photos of lighted crosswalks at an intersection in front of a school).
- Bulb-out treatments: for the installation of concrete bulb-outs at two locations where high numbers of students crossed at mid-block uncontrolled crosswalks (see Figure 5, showing before and after photos at the mid-block crossing in front of a school).
- Traffic sign upgrades: included the systematic upgrade of 400 school area signs to meet the guidelines referenced in MUTCD. These upgrades were the most visible, cost-effective tools utilized (see Figure 6, showing before and after photos of typical upgraded signage).

CONCLUSION

The Pasadena SRTS project set forth an ambitious scope and was successful in taking significant steps for school area safety in a short period of time. The development of up-to-date signage inventories for 19 school areas allowed the transportation department to immediately begin issuing work orders to replace aging and damaged signs. Suggested walking route maps developed with parent and school input are now hosted on the transportation department Web site and used widely at schools.

Through a parent survey, the city established important contacts with school principals, gathered important baseline walking data and reached out to local parents for input on safety recommendations. Finally and, most important, as a result of the project's recommendations, the city implemented $500,000 worth of school-area infrastructure improvements over the past year.

The program's success can be attributed in large part to the outreach and coordination with local schools. Developing maps and surveys that were clear, easy to understand and visually attractive and distributing them with a friendly note asking for input resulted in a good response rate at most schools. By engaging school principals early in the process and gathering input and support from local parents through the surveys, the project team was able to tap into a wealth of local knowledge to help focus the specific improvement recommendations.

This coordination between the schools and the transportation department allowed the rapid implementation of infrastructure projects at the schools that offered the most support and feedback during the program. This will serve as a model for the City as it works with other schools on future school area engineering improvements.

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