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Evaluation of the Safety Benefits of Legacy Safe Routes to School Programs

The main goal of Safe Routes to School (SRTS) programs is to increase children's walking and biking to school. As the SRTS program grew, there arose concern that a possible increase in pedestrian and bicycle exposure from these programs could result in an increase in child pedestrian and bicycle-related crashes. Therefore, the goal of this study was to evaluate the safety impact of SRTS programs in the United States. The programs evaluated in this study were established prior to the passage of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), which sets guidelines for the establishment of SRTS programs. As such, the programs studied are referred to as "legacy SRTS" programs.

This study was conducted in two phases. Phase I examined the feasibility of conducting the study by using secondary source data and determining possible methods to conduct a crash-based study. It was concluded from Phase I that a definitive crash-based assessment of legacy SRTS program effects was not possible. However, it was possible to conduct a preliminary crash analysis to indicate whether a more detailed longitudinal study of the post-SAFETEA-LU SRTS programs is needed.

Both qualitative and quantitative data were collected in Phase II. Researchers collected in-depth information on each program included in the study. This information included school calendars and bell times. A taxonomy was created from this qualitative information and was used to structure the crash data analysis. Crash data from NCSA's State Data System (SDS) was used for the analysis.

Overall, 130 legacy SRTS programs provided sufficiently detailed data to be included in the study. A subset of the program information was used together with SDS data to prepare case studies of the three States with the largest numbers of programs in the study sample. Additional States could not be used because they contained too few programs to support a stable analysis.

Results

Some typical characteristics of these SRTS programs included the following:

- Elementary school programs predominated.
- Programs had typically been in operation for five years or less.
- About half of the studied programs had been completed while the other half were still ongoing.
- Most programs were in urban and suburban locations.
- Most of the programs used multiple E's (engineering, enforcement, education, encouragement, or evaluation), but many of the high dollar value programs consisted only of engineering interventions.
- Highway safety considerations motivated the start of the largest number of programs (the overall percentage motivated primarily by traffic safety concerns was 27.7%).

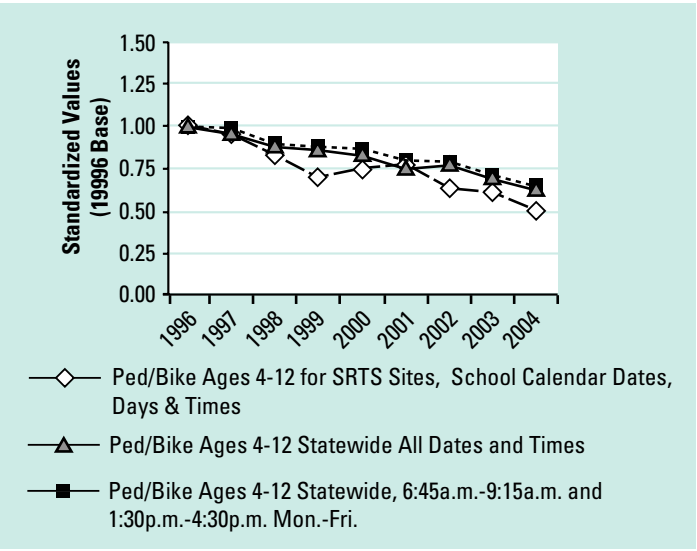
Crash data was analyzed using crash-involved pedestrians and bicyclists as the primary unit of analysis. Crash-involved pedestrians and bicyclists were examined as a function of the age of the person involved and the location of the crash. Location was divided into statewide and SRTS focus city/county components. Victim age was divided into elementary school children (4 to 12 years old) and all other ages (0 to 3 years old and 13+ years old).

The data was standardized to simplify comparisons of a series of greatly differing sizes and to maintain the anonymity of the States (a requirement when using SDS data). The raw numbers of crashes for each year in each series were divided by the raw number of crashes that occurred to the same population subgroup in 1996, thus providing a standardized value for crashes each year in relationship to the crashes that occurred in 1996. Crashes in 1996 were assigned a value of 1.0.

To accomplish a statistical comparison among the various series, linear regression equations were calculated for each data series. These regressions first indicated if there was a significant upward or downward trend in the various series. The parameters of the regressions were also used to test whether any significant trends were differential among the series.

Because all three States showed similar patterns, charts from State 1 will be used to illustrate the findings. Figure 1 shows three series of pedestrian and bike crashes for children age 4 to 12 from 1996 to 2004. One series consists of crashes that occurred in cities or counties with SRTS programs during windows around school bell times when schools were in session. Another series consists of all pedestrian and bike crashes in State 1. The third series consists of pedestrian and bicycle crashes that occurred within the State during school travel times. The data show that pedestrian and bicycle crashes involving elementary school children decreased from 1996 to 2004.

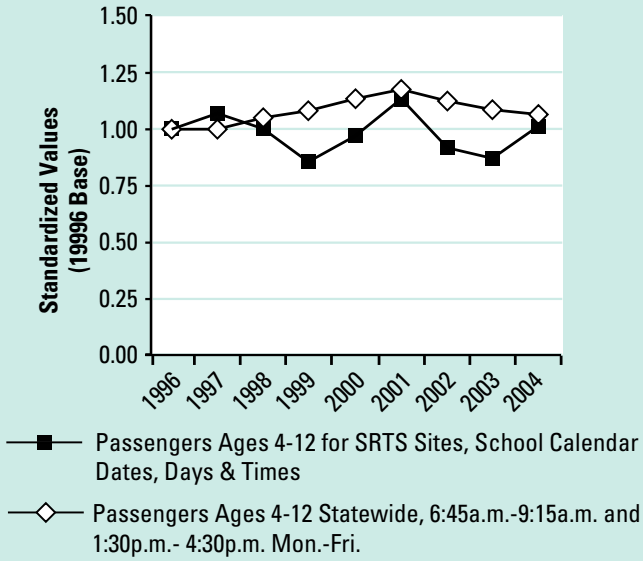
Figure 1: State 1 crash-involved 4- to 12-year-old pedestrians and bicyclists



The results showed that crash-involved elementary school children on the school trip went down significantly in all three States, both statewide and at the SRTS focus sites. Although the State and SRTS focus site decreases were not significantly different, the focus sites did show greater reductions than the States as a whole. Over the same period, pedestrian and bicyclist crash involvement of other ages and the involvement of 4- to 12-year-olds as passengers during the school trip showed no consistent patterns.

Two series were created to examine crash-involved passengers 4 to 12 years old in order to serve as a potential measure of mode shift. One series consists of crashes that occurred in cities or counties with SRTS programs during windows around school bell times when schools were in session. The other series consists of crashes that occurred within the State during school travel times. An increase in crash-involved passengers in this age group could be indicative of more children riding in automobiles to school. The statewide series in Figure 2 for crash-involved passengers 4 to 12 shows a trend of increasing crash-involved passengers that peaks in 2001 and then starts a slight decline over the next few years. The series for crash-involved passengers at the SRTS focus sites is inconsistent with some years showing an increase in crashes and others a decrease.

Figure 2: State 1 crash-involved 4- to 12-year-old passengers



Discussion

The results from this study reveal a consistent pattern of declining pedestrian and bicycle crash involvements of elementary school children over the years during which legacy SRTS programs were implemented. This provides strong support for a conclusion that legacy SRTS programs were at least benign with respect to crashes. However, the data reported from this study are not sufficient to determine if SRTS programs can be credited with decreasing crash involvements.

How to Order

For a copy of *Evaluation of the Safety Benefits of Safe Routes to School Programs,* write to the Office of Behavioral Safety Research, NHTSA, NTI-130, 1200 New Jersey Avenue SE., Washington DC 20590, send a fax to 202-366-7096, or download from http://www.nhtsa.dot.gov. Marvin Levy, Ph.D., and Jenny Percer, Ph.D., were the project officers.

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