# Why Parents Drive Children to School

## Implications for Safe Routes to School Programs

Noreen C. McDonald and Annette E. Aalborg

**Problem**: Rates of walking and bicycling to school have declined sharply in recent decades, and federal and state governments have committed funds to reverse these trends. To increase rates of walking and biking to school will require understanding why many parents choose to drive their children to school and how well existing programs, like Safe Routes to School, work.

**Purpose**: We aimed to understand why many parents choose to drive their children even short distances to school, and what implications this has for programs to increase walking and biking to school.

**Methods**: We used data from a telephone survey to explore why parents drive their children to school.

**Results and conclusions**: We found that 75% of parents driving their children less than 2 miles to school said they did this for convenience and to save time. Nearly half of parents driving their children less than 2 miles did not allow their child to walk to school without adult supervision. Accompanying a child on a walk to school greatly increases the time the household devotes to such a trip. Few Safe Routes to School programs effectively address issues of parental convenience and time constraints.

**Takeaway for practice**: Safe Routes to School programs should take parental convenience and time constraints into account by providing ways children can walk to school supervised by someone other than the parent, such as by using walking school buses. To be effective, such programs need institutional support. Schools should take a multimodal approach to pupil transportation.

In 1969, 41% of all trips to school[1] in the United States were made by walking or biking. By 2001, this had declined to 13%. Over the same time period, the proportion of children being driven or driving themselves to school rose from less than 20% to 55% (Ham, Martin, & Kohl, 2008; McDonald, 2007). The current reliance on motorized modes has raised concerns about air quality (Koushki, Al-Fadhala, Al-Saleh, & Aljassar, 2002; Wilson, Wilson, & Krizek, 2007), declining physical activity and rising obesity (Cooper, Page, Foster, & Qahwaji, 2003; Tudor-Locke, Ainsworth, & Popkin, 2001), congestion around schools (Pedestrian and Bicycle Information Center, 2008), and the developmental impacts of chauffeuring children (Davis & Jones, 1996; Mackett, Brown, Gong, Kitazawa, & Paskins, 2007; Rissotto & Tonucci, 2002). One policy response to these facts has been the creation of Safe Routes to School (SRTS) programs across the country. The current federal transportation bill (Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users; SAFETEA-LU) included $612 million to "enable and encourage children . . . to walk and bicycle to school" by making "bicycling and walking . . . a safer and more appealing transportation alternative" (SAFETEA-LU, 2005).

Despite the funding for SRTS programs, there have been few appraisals of the effectiveness of different SRTS strategies. A recent report on the SRTS explores the influence of family, environmental, and institutional factors on children's travel patterns.

**Keywords**: walk to school, parents, children, Safe Routes to School

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program by the Government Accountability Office identified a need for a comprehensive evaluation to establish the effectiveness of the program (Government Accountability Office, 2008). The few evaluations that exist provide some evidence of increased walking and biking in places that receive SRTS funding. However, these studies had small sample sizes or lacked controlled comparisons (Boarnet, Anderson, Day, McMillan, & Alfonzo, 2005; Boarnet, Day, Anderson, McMillan, & Alfonzo, 2005; Staunton, Hubsmith, & Kallins, 2003).

Absent rigorous program evaluations showing what works and what does not, SRTS advocates and planners rely on assumptions about what will motivate children to walk and bike to school more frequently. For example, an underlying tenet of the SRTS program is that more children will walk and bike to school if traffic safety along the route to school improves. This is not unreasonable, since parents in the United States and United Kingdom identify traffic danger as a major barrier to walking or biking to school (Dellinger & Staunton, 2002; Hillman, Adams, & Whitelegg, 1990; Martin & Carlson, 2005), but removing this barrier may not be sufficient. When parents are instead asked why they drive their children to school, they rarely cite traffic danger as the primary reason. Instead, studies in England (Bradshaw, 1995; Joshi & MacLean, 1995) have found convenience and parents' desire to spend time with children as the primary reasons they drive them to school. Other researchers have documented a sharp decline in parents' willingness to let children travel without adult supervision (Hillman et al., 1990; O'Brien, Jones, Sloan, & Rustin, 2000). These reasons for driving children to school will be unaffected by infrastructure improvements funded through SRTS.

To increase walking and bicycling rates, some children who are now driven to school will have to switch to traveling on foot or bike. We address the lack of knowledge about what would cause more children to walk and bicycle to school by evaluating why parents living within 2 miles of their children's schools drive their children to school. We also discuss the equity implications of increasing rates of walking and bicycling to school instead of improving safety for those children who currently walk and bicycle to school.

## Background

As noted above, the most recent federal transportation bill, SAFETEA-LU (2005), included $612 million for a federal SRTS program in the 50 states and the District of Columbia. Under this legislation, each state receives federal money in proportion to the number of children enrolled in elementary and middle schools (kindergarten through eighth grade). The goals of the program are:

1. to enable and encourage children, including those with disabilities, to walk and bicycle to school;
2. to make bicycling and walking to school a safer and more appealing transportation alternative, thereby encouraging a healthy and active lifestyle from an early age; and
3. to facilitate the planning, development, and implementation of projects and activities that will improve safety and reduce traffic, fuel consumption, and air pollution in the vicinity of [elementary and middle] schools (SAFETEA-LU, 2005, n.p.).

These federal funds, which do not require a state match, may be used for infrastructure (70–90%) and noninfrastructure (10–30%) projects within 2 miles of a school. Infrastructure projects include constructing sidewalks, bike lanes, trails, and well-marked intersections as well as calming traffic near schools. Noninfrastructure projects include marketing campaigns, safety education, student incentives, and funding for training, volunteers, and managers of SRTS programs (Federal Highway Administration, n.d.).

### The Policy Problem: The Current State of Walking and Biking

Although the overall rates of walking and biking in the United States are low, many children walk to school when they live nearby. Among children in kindergarten through eighth grade, 53% of those living less than 1 mile from school and 36% of those living less than 2 miles from school reached school on foot or bike in 2001.[2] However, only 40% of children in kindergarten through eighth grade lived within 2 miles of their schools, which is the area targeted for investment by the SRTS program. This means that SRTS funds can be used (a) to improve pedestrian safety for the approximately 14% of all children in kindergarten through eighth grade who live within 2 miles of school and currently walk or bike, or (b) to encourage the 18% of all children in kindergarten through eighth grade who live within 2 miles of school and currently arrive by private car to switch to walking or biking.

### Research on SRTS Program Effectiveness

Despite claims that SRTS programs increase walking and biking to school, decrease congestion near schools, increase physical activity, and decrease air pollution, these programs have not been much evaluated. A recent Government Accounability Office report on the SRTS program

called for evaluating the program rigorously across a range of outcomes including "safety benefits, behavioral changes, . . . improved student health, improved air quality, decreased traffic congestion and others" (Government Accountability Office, 2008, p. 4). Part of the reason for the lack of evaluation is that federal funding is relatively new and there has been limited time to monitor outcomes. However, California and some other states have longer histories because they had state-funded SRTS programs and early pilot projects. Most of the evaluations of these projects have been positive, but some have had methodological flaws.

Marin County, CA, has one of the oldest SRTS programs in the country, established in 2000 with local funds and a grant from National Highway Traffic Safety Administration. The program subsequently received funds from the Marin County Congestion Management Agency and the Bay Area Air Quality Management District and now has ongoing support through a transportation sales tax measure (Marin County Bicycle Coalition, 2008). An evaluation of this program reported that between the fall of 2000 and the spring of 2002, walking increased 64%, biking increased 114%, and auto trips to take a single child to school fell 39% (Staunton et al., 2003). However, data from schools participating in the Marin SRTS program from 2000 to 2005 showed that walking and biking increased between fall and spring of each school year, but gave no evidence of an upward trajectory in walking or biking over the time period as a whole (Nelson\Nygaard Consulting Associates, 2004, 2005; Staunton et al., 2003). Because no control schools were included in the analysis and because the surveyed schools changed year to year, it is difficult to separate program effects from seasonal variation.

Research at 10 California elementary schools that received SRTS infrastructure improvements found that 15% of parents whose children passed the SRTS projects reported their children walked more after project completion. Among students who did not pass such projects, only 4% reported more frequent walking. However, because the study relied on parental recall and evaluation of past behavior, it is unclear whether there was any measurable change in the overall percentage of children walking and biking to the study sites before and after the SRTS intervention (Boarnet, Anderson, et al., 2005). At eight of the schools, researchers counted more children walking near the infrastructure improvements after the SRTS projects were completed (Boarnet, Day, et al., 2005). However, they did not count walkers along control routes, making it unclear whether the increases were entirely attributable to the SRTS improvements. Researchers also found significant increases in the proportion of vehicles yielding to pedestrians after traffic signal improvement projects at two of the schools. Effects on vehicle speed were inconsistent. At four of the five schools that implemented sidewalk gap closure projects, researchers found highly significant reductions in the percentage of children walking in the street. These results suggest that infrastructure improvements can modify travel behavior, but the researchers were unable to link investments to changes in the overall proportion of students walking and biking to school.

Few studies have looked at how SRTS affects injuries. In a study of 125 improvements funded by the California SRTS program, Orenstein, Gutierrez, Rice, Cooper, and Ragland (2007) found no difference in the number of injured child pedestrians between areas near SRTS improvements and areas that did not receive any improvements. The authors argued that because more children are walking in areas near SRTS improvements, these results actually show that the injury rate is lower in areas that receive infrastructure improvements. Unfortunately, no data on walking and biking exposure were collected for the study areas and therefore this assertion is untestable.

## Data

We studied children between the ages of 10 and 14 living in the San Francisco Bay Area by surveying their parents. We chose this age group because previous research found that children in the United States begin to travel independently around the age of 10, meaning children of this age might be allowed to walk or bike to school (Matthews, 1992). We chose the study area by selecting zip codes in Oakland, Berkeley, Albany, and Richmond, CA, with walkable built environments, defined as the presence of gridded streets, sidewalks, and flat topography (Cervero & Duncan, 2003; Handy, 2005). From zip codes with the appropriate environmental conditions, we selected nine that were economically and racially diverse. Previous research had also shown that walking to school in this area was relatively common (McDonald, Librera, & Deakin, 2004).

We drew our sample from the Kaiser Permanente Northern California membership database. Trained staff from the Kaiser Permanente Division of Research conducted interviews in Spanish and English. Kaiser Permanente provides health services for approximately one in five residents of the study area, and previous research has shown that these Kaiser Permanente members are representative of the population (Gordon, 2006; Krieger, 1992). After randomly choosing members aged 10 to 14 living in selected zip codes, Kaiser Permanente staff mailed a letter informing parents about the study and allowing them to choose not to participate. Two weeks after sending out the

letters, Kaiser research staff contacted parents to schedule phone interviews.

Between August 2006 and May 2007, the Kaiser Permanente staff attempted to contact 1,637 potential respondents and conducted 432 interviews. Of the contacts attempted, 311 parents refused to participate or spoke a language other than Spanish or English; 534 did not answer the phone after six attempts; and 360 were not eligible due to incorrect or disconnected phone numbers. This equates to a raw response rate of 26% and a response rate of 34% after adjusting for ineligible households. The cooperation rate among reachable households was 58%. For this analysis, we only include respondents with valid home and school addresses, which allow us to measure each child's distance to school along the street network. The final sample size was 403 parents.

The survey asked respondents how their children traveled to and from school, with whom they traveled, and why they were driven or escorted. We adapted questions from the National Household Travel Survey (U.S. Department of Transportation, 2004) and instruments developed by Hillman et al. (1990). We assessed reasons for driving children to school by asking "Why is [child's name] driven to school?" and allowing parents to give open-ended responses, which interviewers coded into categories defined during pretesting. Parents were allowed to give multiple reasons; however, the majority gave one response. We also collected basic demographic information on household structure, parental work and commute patterns, the child's age, the child's race, household vehicle ownership, and income.

Previous research has shown that school travel varies significantly with age and race (McDonald, 2008b). Thus, we standardized all results to the overall study totals by age (in single-year categories from 10 to 14) and race (non-Hispanic White, non-Hispanic Black, non-Hispanic Asian/Pacific islander, Hispanic, multiracial/other/missing) to control for these sources of variation.

The study population was equally divided between boys and girls and approximately one fifth of the children were in each age category (see Table 1). Racial and ethnic diversity was high, with nearly one third of the sample self-identifying as Hispanic and 15% as non-Hispanic Black. Approximately one quarter of the children came from households making under $40,000 per year, and just over one third from households making more than $80,000. As expected, children participating in this study lived much closer to their school than the national average, with about 40% living less than 1 mile from school (Ham et al., 2008). This reflects the relatively high density of schools and students in the study area.

Table 1. Characteristics of survey respondents versus those of the study area children aged 10 through 14.

| | Percentage of survey respondents | Percentage of study area[a] children aged 10 through 14 (Census 2000) |
|---|---|---|
| **Child's sex** ($n$ = 378) | | |
| Male | 49.7 | 50.8 |
| Female | 50.3 | 49.2 |
| **Child's age** ($n$ = 394) | | |
| ≤10 | 19.3 | 21.8 |
| 11 | 20.1 | 20.6 |
| 12 | 20.3 | 20.2 |
| 13 | 20.1 | 18.9 |
| ≥14 | 20.3 | 18.4 |
| **Child's race** ($n$ = 394) | | |
| Non-Hispanic White | 29.2 | 28.5 |
| Non-Hispanic Black | 15.2 | 23.9 |
| Non-Hispanic Asian/ Pacific Islander | 10.2 | 22.0 |
| Hispanic | 32.7 | 20.9 |
| Multiracial/other | 12.7 | 4.7 |
| **Household income** ($n$ = 380) | | |
| <$40,000 | 25.8 | [b] |
| $40,000–80,000 | 36.6 | [b] |
| >$80,000 | 37.6 | [b] |
| **Distance to school** ($n$ = 401) | | |
| ≤1 mile | 41.7 | |
| 1–2 miles | 27.2 | |
| 2–3 miles | 11.0 | |
| >3 miles | 20.2 | |

Notes:

a. In zip codes that were part of the study area.

b. Census income categories did not match our survey after we adjusted for inflation.

## How Are Children Getting To and From School?

The largest proportion of students, 46%, was driven to school (see Figure 1). Nearly 30% of students walked to school. The walkers were equally likely to be escorted by their parents, to travel with friends or siblings, or to walk to school by themselves. Approximately 10% of students used public transit to reach school. About half of these students were unaccompanied, while the remainder traveled with their parents, siblings, or friends. Most schools in our study area do not provide school bus service, and this is reflected in the small proportion of students reporting that

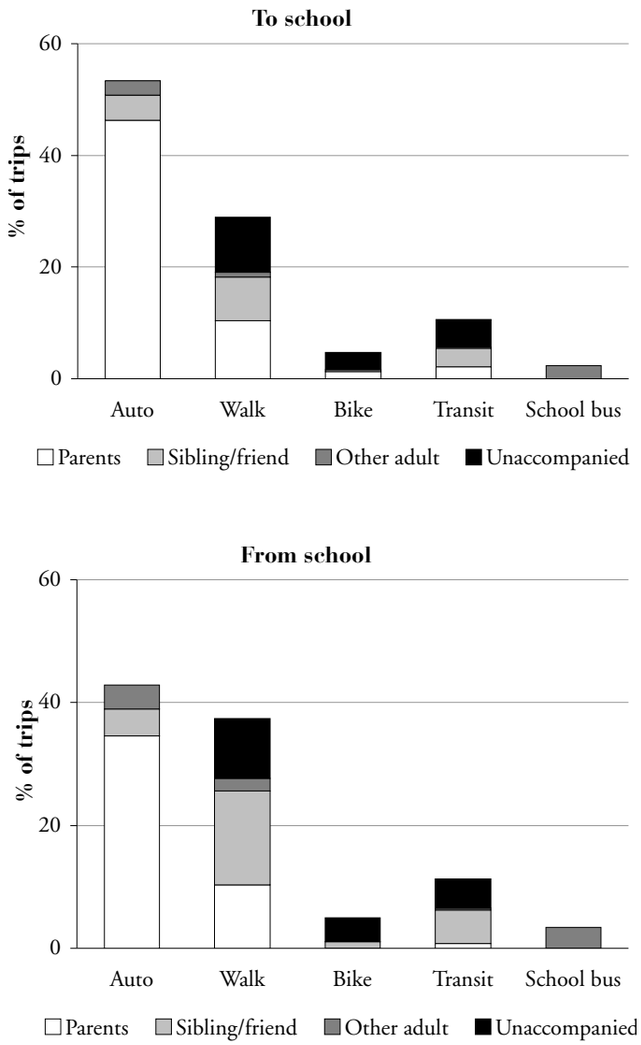


Figure 1. Travel mode and escort for trips to and from school.

they ride school buses. Nationally, 35% of all schoolchildren ride school buses, but the share is much smaller in California since Proposition 13 reduced education funding (Ham et al., 2008; Surface Transportation Policy Project, Transportation and Land Use Coalition, & Latino Issue Forum, 2003). This may become more common across the country as school budgets tighten and districts cut transportation funding (de Vise, 2008).

Mode and escort patterns were different as students travelled home from school in the afternoon. Fewer students were driven by their parents in the afternoon and more walked home with friends or siblings. The difficulty of coordinating school and work schedules in the afternoon likely explains this mode shift and is consistent with what has been found in other studies (Schlossberg, Greene, Paulsen, Johnson, & Parker, 2006; Vovsha & Petersen, 2005; Yarlagadda & Srinivasan, 2008).

For trips under 2 miles, 42% of children in our study walked or biked to school, a rate comparable to the overall U.S. average for this distance. But this masks the strong negative correlation between walking to school and distance (see Figure 2). Approximately three fourths of children living less than one half mile from school walked or biked. This declined to 18% for trips of between 1 mile and 1.5 miles. This decline reflects the relative time advantage of autos as trip distance increases and is consistent with previous research highlighting the importance of distance (McDonald, 2008a; McMillan, 2007; Schlossberg et al., 2006; Yarlagadda & Srinivasan, 2008). Children were accompanied by a parent for one out of three walking trips in our study. For these trips, the time costs of school travel depend not only on the child's travel time, but also on the parent's travel time. On walking trips, the parent usually must travel the full distance both ways, potentially taking twice the time. For auto trips, many parents save time by coordinating school drop-off with their own work trips.

## Why Are Children Driven to School?

Increasing the proportion of children walking to school, which is a goal of the SRTS program, requires changing the behavior of children who are currently driven to school but live close enough to walk. To assess the barriers to

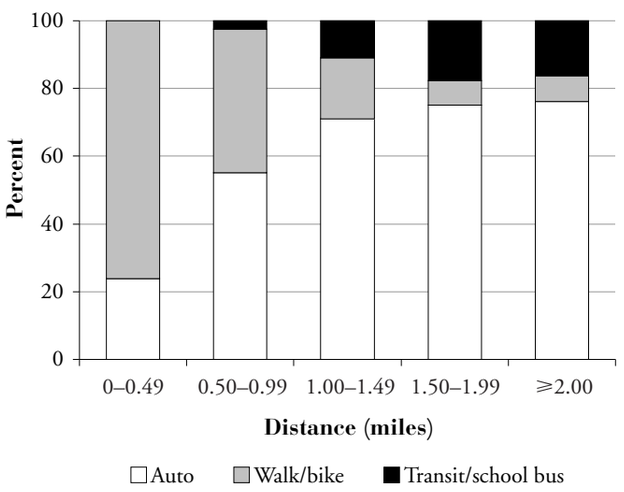


Figure 2. Mode shares to school by network distance to school.

changing mode, we asked parents why they drove their child to school and whether they allowed their child to walk to school without adult supervision. Parents' reasons for driving their children fell into two main categories: convenience and safety (see Figure 3).

About 75% of parents driving their children less than 2 miles to school cited convenience as a reason. Their responses emphasized the relative time advantage of driving over walking. For example, some parents reported "we save 5–10 minutes driving" and "parents running late." Others said the school was too far away, another way of indicating that the time costs of walking outweighed the costs of driving, and that walking was not in their choice set. Many parents dropped off their children on their way to work, presumably saving time over walking their child to school, walking home, and then driving to work. Of the group driving for convenience reasons, 46% did not allow their children to walk without adult supervision.

Just over 30% of parents living within 2 miles of school reported safety as a reason they drove their child to school. These parents reported much greater concern about danger to their children from strangers than they did about traffic concerns, and 75% did not allow their children to walk to school without adult supervision. In fact, many of these 10 to 14 year olds were not allowed to leave their homes without adult supervision. Previous research on barriers to walking has found that traffic concerns were more prominent (Martin & Carlson, 2005). Our results likely reflect our study area, located in first-ring suburbs where some neighborhoods have high crime rates.

## Implications for Safe Routes to School Programs

To increase walking and biking to school in this country, children living near school must switch from travelling in autos to travelling on foot or by bike. This can be accomplished only by changing the behavior of children who are currently driven walkable distances. We found that many parents would not allow their 10- to 14-year-old children to walk to school on their own, and did not want to take the time to accompany their children to school.

Half of the parents who drove their children less than 2 miles to school did not allow them to walk without adult supervision (see Figure 4). To change the behavior of this group, SRTS interventions would have to provide supervision on the walk to school or radically change parents' opinions about their children traveling without supervision. Public policy is better suited to the former alternative. Supervision programs also directly address concerns about encountering strangers and make walking more convenient

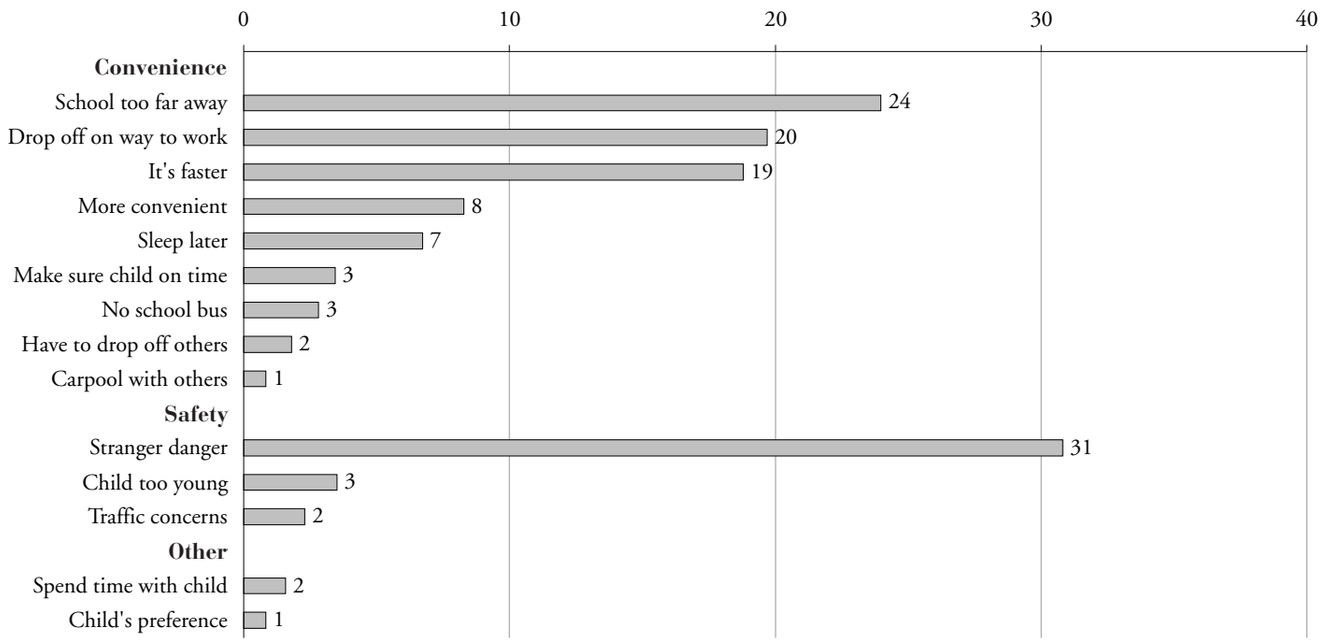


Figure 3. Reasons respondents gave for driving children less than 2 miles to school.

Note: Multiple responses were allowed, so the total does not sum to 100%.

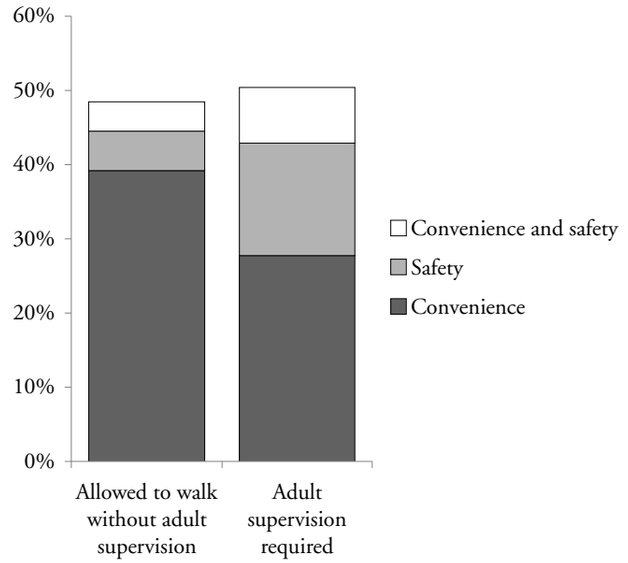


Figure 4. Percentage of parents reporting reasons for driving children less than 2 miles to school, and whether or not their children were allowed to walk without supervision.

by eliminating the time costs to parents of walking their child to school and returning home before beginning their own activities.

Shifting the travel patterns of the 50% of children who were driven to school even though they were allowed to walk without supervision is more challenging. Among these, parents with safety concerns might also switch behavior if children were supervised by trusted adults while walking to school. However, increasing walk rates among the nearly 40% of children who were allowed to walk by themselves but were driven for convenience may be more difficult (see Figure 4). For these families, the time costs of driving are presumably less than they would be if the child walked to school, and public policy may not be able to affect the relative time advantage of the auto. For example, it would take a student living three fourths of a mile from school about 15 minutes to walk or 5 minutes to drive. The family could use the travel time savings to sleep 10 minutes later in the morning or better coordinate with parents' travel schedules.

In summary, a SRTS program providing adult supervision and eliminating the parental time costs of walking children to school could address the concerns of 60% of parents who currently drive children less than 2 miles to school. If all of these children switched modes, the share of trips of less than 2 miles made by walking would increase from the current level of 42% to just over 70%. In terms of the entire sample, this would represent an increase from the current level of 30% walking to school to just over 50% traveling on foot. While such extreme shifts are unlikely, our study suggests that the most effective way to convince drivers to walk would be programs that offer supervision for children as they walk to school.

## Alignment of SRTS Interventions and Parental Concerns

How well do current SRTS programs meet parents' requirements for adult supervision and convenience? The legislation stipulates that the majority of SRTS funds must be spent on infrastructure projects. While such projects can make these trips safer from traffic danger, they are not likely to change the behavior of parents who require adult supervision for their child or drive for convenience. Instead, noninfrastructure projects aiming to educate and encourage are more suited to addressing these issues. Currently, expenditures on these types of programs are limited to 10 to 30% of a state's SRTS budget.

The *Safe Routes to School Guide* (Pedestrian and Bicycle Information Center, 2008) identifies the most common noninfrastructure SRTS interventions. We assessed these policies (Table 2) to see whether they provided supervision or addressed parental time costs, and found few that addressed these issues. Only walking school buses and possibly parental education address both supervision and convenience concerns. Walking school buses are the most promising intervention because they provide adult supervision for the entire trip from home to school. They are described in detail in the next section. Other efforts, such as park and walk or on-campus walking activities, provide supervision for children while walking, but not for the trip from home to school. Rather they are intended to build excitement about walking. Parental education could affect behavior if it emphasizes children's age-dependent readiness for walking without adult supervision.

### Walking School Buses

A walking school bus (WSB) is a group of children led to school by an adult. WSBs range from informal agreements among neighbors to formal programs sponsored by the school or local community groups in which trained adults called *drivers* follow an assigned route and make stops at specified times. The WSB assures parents that their children will arrive at school on time and be supervised by an adult for the entire trip. It is also convenient, since the parent need not escort the child.

Table 2. Noninfrastructure SRTS programs that address supervision and convenience concerns.

| Program | Address supervision concerns | Address convenience concerns |
|---|---|---|
| **Encouragement** | | |
| Walking school bus | ✓ | ✓ |
| Park and walk | ✓ | |
| On-campus walking activities | ✓ | |
| Mileage clubs and contests | | |
| Special events[a] | | |
| Route maps with estimated walk times | | ✓ |
| **Education** | | |
| Links to lesson plans | | |
| Pedestrian/bicycle safety instruction | | |
| Parental education | ✓ | ✓ |
| **Enforcement** | | |

Notes:

a. International Walk-to-School Day is an example of a special event.

Engwicht (1992) is credited with introducing the idea of a WSB. The first example documented in the literature occurred in 1996 in Canada (Kingham & Ussher, 2005). Programs have since begun in Denmark, the United Kingdom, New Zealand, Australia, and the United States (Mackett, Lucas, Paskins, & Turbin, 2003). There have been relatively few evaluations of WSB programs, but those that have been done provide evidence of strong social benefits. Surveys of parents and children in the United Kingdom and New Zealand found that both groups identified the opportunity to spend time with and get to know neighbors as a primary benefit (Kingham & Ussher, 2007; Mackett et al., 2003). From a transport perspective, the programs seem to be effective at increasing walk rates by attracting children who were previously driven to school. The British study found that many of the students using the WSB were former or occasional car riders (Mackett et al., 2003), and a study in Auckland found that most of the students using the WSB were previously driven to school (Collins & Kearns, 2005). Researchers studying the WSB in Christchurch, New Zealand found that students greatly improved their road safety skills, and parents became more familiar with the child's competence at navigating the public realm (Kingham & Ussher, 2007).

The National Center for SRTS provides information on how to start a WSB program (National Center for Safe Routes to School and Pedestrian and Bicycle Information Center, n.d.). They recommend an incremental approach in which parents develop ad hoc walking groups that then may evolve into a larger program. This approach recognizes the administrative challenges of formal WSB programs, for which walking routes must be set and stops identified, volunteers recruited, and the program advertised every year. WSB programs are only likely to be popular with parents if they truly make life more convenient. This means that parents must not be unduly taxed with volunteering or organizing for the program.

The evaluations of WSB programs have noted how the administrative requirements can negatively affect participation. The longitudinal study of WSB in Christchurch found that over 50% of WSB routes ended after one year (Kingham & Ussher, 2005). A major reason for ending the routes was difficulty finding volunteers. The parents who had volunteered to serve as drivers felt overburdened and opted not to continue with the program. These results were echoed by a survey of WSB parents in England in which one group of parents reported substantial time savings because of the program, while another group reported losing time because they supervised the children while walking (Mackett et al., 2003). Such unequal volunteer and administration burdens are likely to make it difficult to sustain the program over time.

Kingham and Ussher (2005) recommended that schools and local governments provide more institutional support for WSB by coordinating volunteers and facilitating meetings. Another solution is to use local volunteers who are not necessarily parents as the WSB drivers. This could provide increased community interaction and lessen the time burden on parents. For example, the Walk There program sponsored by the Oregon Department of Environmental Quality planned to use seniors as WSB drivers. The program was never implemented because of liability concerns; a similar outcome occurred when walking advocates proposed using seniors to lead WSB in Larkspur, California (Baker, 2004).

In fact, liability is a primary reason for the lack of institutional support for WSB programs in the United States. Many American school districts are unwilling to formally sponsor WSB because they are concerned they would be liable for any injuries that occur during the walk to school (Baker, 2004). Since the 1980s, many state courts have held that schools are liable only if they were aware of a danger and did nothing to reduce the danger, which is considered "willful and wanton negligence" (Baker, 2004, n.p.). When schools transport students on schools buses, they assume the "responsibility of the parent or guardian" and will be "held liable for foreseeable injuries which are proximately related to the absence of supervision" (Katz, 2006, n.p.).

Presumably a similar standard would exist if schools sponsored WSB routes. However, there have been no test cases, so it is not known exactly how the courts would interpret "foreseeable injuries" for WSB. However, strategies have emerged to address liability concerns. A school district can ensure that its umbrella insurance policy covers its SRTS program. This is the most comprehensive solution and, from a liability perspective, would treat walking to school in the same manner as taking the school bus. If school districts are unwilling to directly cover SRTS programs, insurance could be sought through other parties such as the Parent Teacher Association. Alternatively, if a community group assists with organizing the WSB, they may purchase insurance directly. For example, PedNet Missouri organizes a successful WSB program in Columbia and has purchased liability insurance for that program.

## Making Pupil Transportation Multimodal

Our analysis of what it takes to increase the proportion of students walking to schools suggests that WSB programs could be important. However, these programs will not be successful and sustainable without administrative support and liability coverage. In other words, it must be someone's job to create a successful WSB program. Under the federal SRTS guidelines, this can be difficult to accomplish. Funds for noninfrastructure projects are limited to 10 to 30% of a state's total funding, and, in some states, the noninfrastructure funds must be used for programs, not salaries. A few places, such as Marin County, have addressed this challenge by taxing themselves to provide a dedicated funding stream for SRTS programs (Marin County Bicycle Coalition, 2008). However, this is rare.

As diesel fuel prices rise and interest in SRTS programs increases it seems logical to think about pupil transportation as a multimodal function. Currently, pupil transportation departments provide state-mandated yellow school bus service, but are not involved with other modes of school access. Part of this has to do with the genesis of pupil transportation. The government's involvement in pupil transportation dates to the 1800s, when education reformers promoted school consolidation. Before public schools could consolidate they often had to make arrangements to transport students who would live very far from their new schools (Smith, 1972). Over time, this has evolved into statutes in a majority of states that require school districts to provide transport to students living more than 1 or 2 miles from their schools (McDonald & Howlett, 2007). Many states also offer transport to students who live less than 1 mile from school, but face hazardous walking conditions. Some, but not all, require that state-mandated transport be provided at no cost to students, and many states offer partial reimbursement to school districts for transport expenses. The cost of the current U.S. pupil transportation system was $17 billion in 2003–2004, or approximately 4% of all school expenditures (U.S. Census Bureau, 2006).

Pupil transportation has evolved incrementally from a service designed to assist the few students living very far from school to one charged with getting a majority of students to school. As service expanded, there was no reassessment of modal options. There are some analogies between current pupil transportation approaches and transportation planning prior to 1990. The 1991 Intermodal Surface Transportation Efficiency Act (ISTEA) gave state and regional transportation agencies more flexibility to meet mobility goals by spending on something other than auto-oriented infrastructure. It also required each state Department of Transportation to hire a bicycle and pedestrian coordinator for "promoting and facilitating the increased use of nonmotorized modes of transportation, including developing facilities for the use of pedestrians and bicyclists and public education, promotional, and safety programs for using such facilities" (ISTEA, 1991).

No such requirements exist for pupil transportation. However, there are a few districts that have staff dedicated to options other than school buses. For example, the 4-J school district in Eugene, OR, has hired a full-time employee to manage the SRTS program. In other areas, such as Marin County, nonprofit and advocacy groups have hired staff to manage the SRTS programs. Currently, the examples are limited. However, they highlight the potential for schools to think more holistically about transport options. For example, school district staff could manage SRTS programs and school districts could consider the economic tradeoffs between expanding school bus service and encouraging walking and biking. Recent increases in diesel fuel costs caused many school districts to reduce school bus service (de Vise, 2008), raising the possibility of using some pupil transportation funds to support children walking to school. For example, the funds might be used to fund a transportation staff member to develop walking routes, coordinate volunteers, and inform parents about the programs. Going even further, districts could hire adults to walk specified routes and pick up children along the way. Any of these options would represent a major change in the business of pupil transportation and would likely face opposition. However, it should be possible to develop pilot programs to test the efficacy of such programs.

## Equity and Walking to School

Finally, the issue of equity has not been prominent in discussions of SRTS programs. We know that minority and low-income youth walk to school at rates two to three times those of White students (McDonald, 2008b). We also know that the pedestrian injury rates are much higher for minority youth (Agran, Winn, Anderson, & Del Valle, 1998; Centers for Disease Control Web-Based Injury Statistics Query and Reporting System, 2007). This suggests the potential for conflict between the program's dual goals of a) increasing the number of children who walk and bike to school and b) making travel safer for current and new walkers. To improve the safety of walking to school and reduce child pedestrian injuries, SRTS funds should be targeted at schools where children are currently walking. These schools will be disproportionately urban, with large low-income and minority populations. However, improving safety may not increase walk rates much at such schools because they are already high. Increasing walk rates requires children and their parents to switch from driving to walking, and thus must focus on children who are not already walking to school. These children, who are more likely to be White and suburban, have other options and must be convinced to walk.

This conflict is common to many transportation programs where concerns about distributional and geographic equity conflict with income and race-based definitions of equity. For example, many transit agencies aim to attract *choice riders*, who could choose to drive instead. Attracting choice riders often requires rail extensions into low density suburban areas where transit is inefficient (Crane & Schweitzer, 2003). As happened in Los Angeles in the 1990s, funding such rail expansion can reduce service for those already riding transit (Garrett & Taylor, 1999; Grengs, 2002). Similarly, the SRTS program can aim to attract *choice walkers* who will often be White and will often live in suburban areas poorly suited to walking, or it can aim to improve infrastructure in areas where many children are already walking.

There is no simple solution to this issue. However, states regulating SRTS programs could bring attention to the issue and provide baseline funding for low-income areas. For example, states could consider area socioeconomic status in evaluating SRTS applications, provide additional assistance to disadvantaged areas in the application process, or set aside a portion of SRTS funds for low-income and minority areas.

## Conclusions

To increase rates of walking to school, our study shows that SRTS program managers should offer noninfrastructure programs that provide adult supervision and decrease the parental time costs of walking a child to school. We estimate a program addressing these concerns could affect the behavior of 60% of parents who currently drive their children less than 2 miles to school.

However, SRTS programs have emphasized the importance of improving traffic safety as a means of increasing walking to school and decreasing injury. While safety is an important concern, our study suggests that in urban and higher density suburban areas improving traffic safety is not sufficient to convince families to change their school travel behavior. One approach that can meet parental requirements for supervision and convenience is the WSB, in which parents or community volunteers share responsibility for walking groups of children to school. SRTS program managers can facilitate the creation of such programs in their areas by designating routes and recruiting volunteers.

There is also an institutional aspect that needs to be considered; it may be time for school districts' pupil transportation departments to consider other modes of transportation in addition to school buses.

Finally, the SRTS program's stated goals of increasing walking and making walking safer sometimes conflict. Encouraging more children to walk by choice may take resources that could otherwise be used to improve traffic safety in low-income and minority areas that have high walk rates and high pedestrian injury rates. State SRTS coordinators can work to increase access to SRTS funds in disadvantaged areas through grant evaluation criteria, application assistance, and programmatic set-asides.

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**Notes**

**1.** A *trip to school* refers to the trip a student makes between home and school, generally in the morning. Available modes are usually auto, bike, walk, school bus, and transit.

**2.** This is from the author's calculations, based on data from McDonald (2007).

**References**

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