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Evaluating safe routes to school events that designate days for walking and bicycling

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ABSTRACT

This paper presents a case study evaluation of days designated for walking and bicycling as part of a Safe Routes to School program. The case study examines two elementary schools in Moscow, Idaho that annually participate in two designated days for walking and bicycling, "International Walk to School Day" in the fall and "Fill the Racks!" in the spring. Students walking or bicycling to school were counted before and after the events. For comparison, counts were also observed at a nearby school not involved with the Safe Routes to School program. Count data was collected for 8 days. Furthermore, 45 students and 17 parents were surveyed; and five parents and four community leaders were interviewed. The count data showed a significant increase in students using active modes of travel on the day of the event and a few weeks later. The interviews and surveys showed, among other things, there is strong support for the special events and most parents felt the designated days increased their child's motivation to walk to school. Many parents said the spring event prompted their child to return to walking to school after the cold winter months. Policy implications and other lessons learned are provided.

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1. Introduction

Safe Routes to School (SR2S)[1] programs in the United States emphasize encouragement as a means to increase walking and bicycling to school. The National Center for Safe Routes to School (NCSRTS) suggests that local programs designate two special days for encouraging walking and bicycling to school. The first event, "International Walk to School Day," is held in October and the second event, "National Bike to School Day," is held in May as part of National Bike Month (NCSRTS, 2012). Many local SR2S programs advertise the events with posters and flyers sent home with students and often the events involve incentives, prizes, and fun activities. The goal of the events is to reverse the national trend of fewer and fewer students walking or bicycling to school (an estimated decline from 42% in 1969 to less than 15% in 2001) (McDonald, 2007).

Are these events effective? Do the benefits outweigh the costs? Should funds be directed toward encouragement events? From 2005 to 2012 dedicated federal funds were directed to SR2S, but the recent transportation bill, MAP-21, consolidated the available funds into a competitive process with other programs related to recreational trails, environmental mitigation, other pedestrian and bicycle needs, and minor road projects. Furthermore, states can now choose to opt out and transfer 50% of this smaller pool of funds to other uses, such as bridge rehabilitation. If there is a state emergency, 100% of the funds can be taken for rebuilding damaged highways. In the past, states could only transfer 10–15% of these funds to other programs (America Bikes, 2012). This dramatic competition-focused change in funding for SR2S intensifies the need to evaluate all aspects of the program and determine which specific activities are the most effective.

Over the past few years most research related to SR2S has focused on identifying barriers to active travel (such as distance from home, safety concerns, and parent perceptions), while very little research has focused on program evaluation (Weigand, 2008). The few program evaluation studies that have been published do not address specific program activities, but rather provide broad before-and-after evaluation of an entire program (Weigand, 2008). One challenge with achieving focused, activity-specific evaluation is that local programs differ widely, each with its own unique activities. There are, however, a few program activities commonly done across the country. For example, most local SR2S programs participate in the designated days for walking and bicycling.

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[1] The federal Safe Routes to School program in the United States is abbreviated SRTS. Some individual state and local programs use the abbreviation SR2S, such as the local program in this case study.

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This paper presents a case study evaluation of a specific SR2S activity: designated days for walking and bicycling. Data from six different sources are examined: count data for two schools for a fall SR2S event, count data for three schools for a spring SR2S event (including a control school that was not participating in the SR2S event); a student intercept survey; an online parent survey; phone interviews with parents; and phone interviews with key community leaders. Although the results are only a snapshot of a small case study, the findings and recommendations are relevant for any SR2S program. Furthermore, the process for data collection and analysis described in this paper serves as a model for SR2S practitioners seeking to evaluate special encouragement events.

2. Background

Encouragement is one of five "E's" at the center of the SR2S program. The other "E's" are evaluation, education, engineering, and enforcement. The program and its goals can be traced back to Denmark in the 1970s. A few local programs in the US have been around since those early years, but the federal US program began in 2005 with a surface transportation bill allocating $612 million through 2009 (Hubsmith, 2006). Each year until 2012, the program was continued through short-term extensions of the expired surface transportation bill. Federal dollars were allocated to the states based on student enrollment with no state receiving less than $1 million. Each state department of transportation was responsible for administering the funds to local SR2S programs.

The recent transportation bill, MAP-21, consolidated the SR2S program with other programs related to bicycle and pedestrian travel, environmental mitigation, and minor road enhancements. As a result, the Safe Routes to School National Partnership estimates there will be as much as a 70% reduction in available funds (Safe Routes to School National Partnership, 2010). The new, highly competitive process to obtain funding and anticipated efforts to restore dedicated funds in the next transportation bill significantly increases the need for thorough evaluation of the program's effectiveness. The following is a review of commonly used SR2S evaluation tools and formal evaluation studies.

2.1. Tools for evaluation

A number of organizations have developed easy to use evaluation tools for local programs. The NCSRTS provides numerous resources to start and maintain a local SR2S program, including the "In-Class Travel Tally" to help determine mode share to and from school (NCSRTS, 2012). The In-Class Travel Tally is a simple survey that records a hands up, hands down response to classroom teachers asking how students traveled to school and how they plan to travel home. It is recommended that teachers conduct the travel tally at least two days in a row between Tuesday and Thursday once in the fall and once in the spring. Local SR2S programs are encouraged to work with schools to collect the In-Class Travel Tallies from teachers and submit the data to NCSRTS headquarters in Chapel Hill, North Carolina. The NCSRTS archives electronic copies on a password protected website.

In 2008, the NCSRTS collaborated with the Pedestrian and Bicycle Information Center (PBIC) to create a guide for conducting program evaluation that includes, among other things, suggestions for using the In-Class Travel Tally (National Highway Traffic Safety Administration, 2008). A study by McDonald et al. (2011) demonstrated the reliability of the In-Class Travel Tallies; however, as part of our case study we examined four years of In-Class Travel Tallies and found a number of errors and inconsistencies in the data.

The PBIC also provides a "Walkability Checklist" and "Bikeability Checklist" to assess various aspects of the built environment (Pedestrian and Bicycle Information Center, 2012). These and other "audits" can be used to increase awareness about the physical environment and track engineering efforts over time (Kingsbury et al., 2011). The Safe Routes to School National Partnership, a coalition building network of organizations, a clearing house website for sharing ideas about many important topics, including program evaluation (Safe Routes to School National Partnership, 2010). Another potential resource is the National Household Travel Survey (NHTS) through which Federal Highway Administration (FHWA) has collected travel data periodically since 1969 (McDonald, 2007).

In 2011, Federal Highway Administration (FHWA) sponsored a report entitled the *Federal Safe Routes to School Program Evaluation Plan* (NCSRTS, 2011). The report outlines a plan for evaluation over the next decade and identifies three key needs: (1) better documentation of state program processes, (2) more studies concerning program activities, and (3) more studies concerning safety improvements.

2.2. Evaluation studies

Numerous studies have focused on identifying barriers for children to walk and bicycle to school, such as weather, distance, parental attitudes, safety perceptions, school policy, and infrastructure deficiencies (Martin and Carlson, 2005; Ewing et al., 2004; McMillan, 2007, Lorenc et al., 2008; Hume et al., 2009; McDonald and Aalborg, 2009; Stewart et al., 2012; Zuniga, 2012). To illustrate this point, the following are recent examples from this journal alone. Zuniga (2012) analyzed 65 parent interviews to determine perceptions about certain barriers. She concluded that negative perceptions diminish as active travel becomes more regular. Stewart et al. (2012) identify what they call the most "common" barriers and offer suggestions for SR2S practitioners to mitigate these barriers. This journal has also published a number of articles concerning children's travel behavior more generally, i.e. not just to and from school, to better understand children's mode choice (Fyhri et al., 2011; Lin and Yu, 2011; Marzoughi, 2011) and children's attitudes toward automobile travel (Arbour-Nicitopoulos et al., 2012; Kopnina and Williams, 2012).

Traffic safety evaluation is another topic with considerable literature; however Dumbaugh and Frank (2007) show that very little traffic safety research specifically addresses SR2S projects. Instead, they argue, the safety benefits associated with SR2S programs are often merely assumed and not empirically proven.

Only a few studies have focused on SR2S program evaluation (Weigand, 2008). Two notable and often-cited studies were done by Staunton et al. (2003) and Boarnet et al. (2005) showing increased walking and bicycling in California. Both studies were broad, before-and-after studies. Evaluation studies that are activity-specific are even more rare; however, this journal has published a few articles concerning a particular SR2S activity called a "walking school bus" (Mackett et al., 2003; Kingham and Ussher, 2005; Collins and Kearns, 2010). A walking school bus is an opportunity for students to walk in groups led by an adult and following a pre-determined route to pick up students along the way. Most walking school bus studies have showed positive benefits, such as the longitudinal study by Collins and Kearns, 2010. Their study showed increased walking rates over a 5-year period, as well as other related benefits (although they note that walking school buses can sometimes reinforce certain aspects of an automobile dependent society).

In general, evaluation studies of specific SR2S activities are scarce. We did not find any academic evaluations of special event days. In her review of the literature, Weigand (2008) concludes that more studies are needed

> …to discern the relative influence of each program element. [Because] When several components of a Safe Routes to School program are started at the same time, it is difficult to determine

which [specific] components effected a behavior change and why (Weigand, 2008, p. 10).

3. Data collection

3.1. Case study community

The case study concerns the local SR2S program in Moscow, Idaho. Since the program's inception in 2006, the Idaho Transportation Department has awarded the local program $269,880 for infrastructure improvements and $103,134 for education and encouragement activities. A portion of the latter funds, have been used to support a part-time (12–16 h per week) local SR2S Coordinator. A key responsibility of the SR2S Coordinator has been to plan, organize and market three annual designated days for walking and bicycling. The fall designated day is referred to as "International Walk to School Day" or "iWalk." The winter designated day is called "Polar Walk" and the spring event is called "Fill the Racks!" The NCSRTS only began promoting a spring event in 2012 and does not mention a winter event, but all three events have been a part of Moscow, Idaho's program since 2006.

The SR2S coordinator estimates that 50–60% of her time is spent preparing for the designated walking and bicycling days including recruiting parents to help, organizing walking school buses and bike trains, coordinating with local police to ensure safety, and working with school administrators and teachers to promote the events and to integrate walking and bicycling into appropriate classroom curriculum. The school principals and others involved feel the designated days are the hallmark of the community's SR2S program.

Quantitative and qualitative data was collected for the case study. Practitioners in other communities could use this procedure as a model for their program.

3.2. Count observation data

In the fall of 2011, volunteers helped count the number of students walking or bicycling to schools. The volunteers were assigned locations around two elementary schools, Lena Whitmore and McDonald. Counts were recorded in 15 min intervals from 7:45 to 8:30 am. Data were collected for 3 days: the day before, the day of the event, and the day after. The goal of the fall count was to measure the increase in all people walking and bicycling to school, so both students and adults were counted. Tick marks were made under the categories walking, bicycling, or other (skateboarding, in-line skating, etc.).

For the spring 2012 count, data were collected for 5 days: one day the week before the event, the day before the event, the day of the event, one day a week later, and one day two weeks after the event. Count data were collected for the same schools counted for the fall event, plus an additional third school, Jefferson Elementary School, in the neighboring city of Pullman, Washington. This was done to allow a comparison with a school not participating in the SR2S event. The two cities are 9.5 miles apart and very similar in terms of demographics and weather. The student body is also very similar with about 400 students per school and similar home-to-school distances of about 1 mile or less. The two cities are separated by a state border and somewhat isolated from each other, so it is doubtful that students at Jefferson Elementary would have been aware of the SR2S event.

3.3. Surveys and interviews

In addition to the count observations, a number of surveys and interviews were conducted. First, on the morning of the spring event, students who were walking or bicycling to school were administered a short questionnaire about their mode choice and knowledge of the SR2S program. Next, an online survey was sent to parents using email addresses provided by the local SR2S Coordinator. It is not possible to determine a response rate because the email recipients were encouraged to forward the emails to other parents. The survey questions focused on the benefits and perceived benefits from SR2S events that designated a day for walking and bicycling. For willing respondents, this was followed by a phone interview of open ended questions. Finally, additional phone interviews were conducted with key community leaders, including the Mayor, Police Chief, members of City Council, and school principals.

4. Findings and discussion

4.1. Count data findings

The count data revealed a substantial increase in active travel on the designated SR2S days. Fig. 1a shows for the fall event there was a 101% increase in the number of students and parents walking or bicycling to school compared to the previous day. Furthermore, the number remained higher the day after the event, yet it is not clear how long the high numbers might have persisted as no other counts were made. The count data collected for the spring event sought to capture a longer time period, so observations were made the week before, the week after, and two weeks after the designated SR2S day. Fig. 1b shows the increased active travel was sustained for at least two weeks after the event. (The count numbers are larger for the fall compared to the spring in part because of rainy and cold spring weather conditions.)

The spring data collection also sought to observe differences in parent escort levels and the number of students walking in groups. Confirming our hypothesis, the number of students with escorting parents (or other adults) increased by 333% on the designated SR2S day (Pearson chi-squared = 11.0, $p = 0.001$). Subsequent parent interviews confirmed that many parents saw the event as an opportunity to have fun with their children. This finding is noteworthy because research has shown that parents who escort their children can effectively, and often unintentionally, teach them how to safely cross streets and navigate urban settings merely by example (Morrongiello and Barton, 2009). Furthermore, the local SR2S coordinator stated that she uses the designated event days as a critical opportunity to interact with parents and inform them about the goals of the program.

On the day of the event the number of students walking in a group increased as well. The median group size increased from two to three and the maximum group size increased from five to nine. These findings demonstrate the potential for organizing a "walking school bus". Even without the presence of an adult, a larger group size may increase safety or perceived safety, and therefore increase parental willingness to let their child walk to school.

Jefferson Elementary, the control school that did not participate in the SR2S event, did not exhibit an increase in students walking or bicycling on the day of the event or in the weeks following (Pearson chi-squared = 11.6, $p = 0.009$). In fact, there was a large drop in the number of students walking or bicycling on the day of the SR2S event which most likely can be attributed to the inclement weather. The week before the event it was 50 °F (10 °C), but on the designated SR2S day it was a cold 34 °F (1 °C) and even snowed a little at all three school locations. The next two weeks the weather was back up around 50 °F (10 °C). Considering the weather, the increase in students walking or bicycling for the SR2S event was even more impressive.

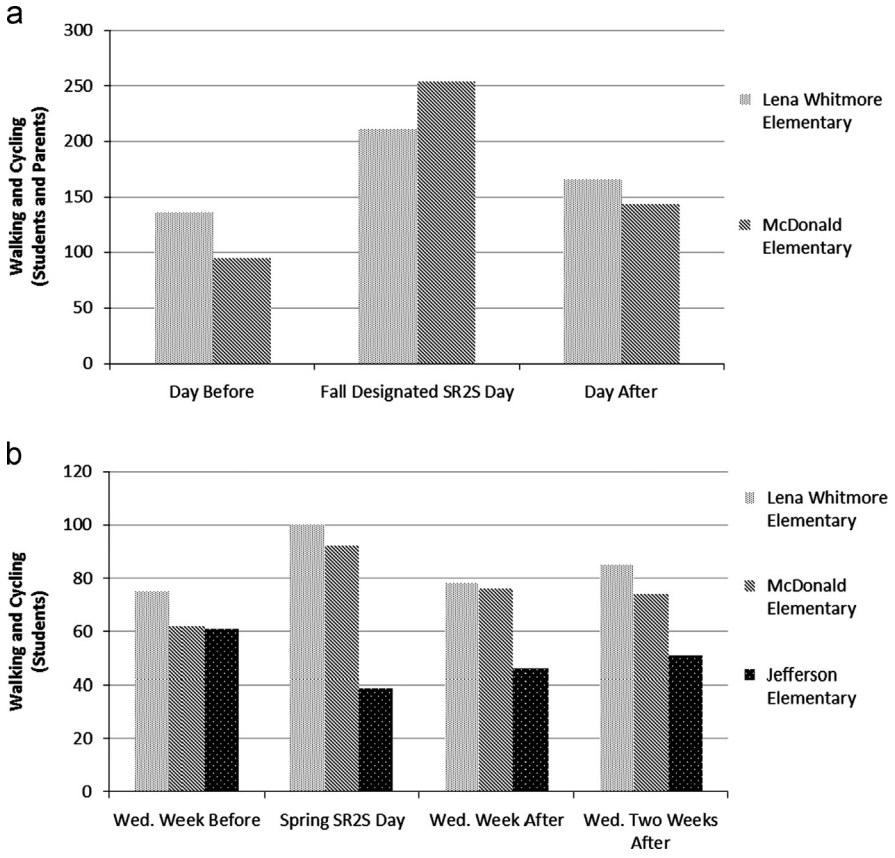

Fig. 1. Number of parents and students walking or bicycling to school: (a) fall and (b) spring.

Table 1
Percent walking or bicycling by event emphasis.

Active travel mode	Fall event: Walking emphasis (%)	Spring event: Bicycling emphasis (%)
Walking	81.1	63.5
Bicycling	18.9	36.5
Total	100.0	100.0

Note: 475 students for fall and 238 students for spring. Pearson chi-squared=24.7, $p=0.000$.

Another finding from the count data was how the SR2S program shaped the students decision to choose between walking and bicycling by emphasizing one mode or the other. For both the fall and spring events students were encouraged to use any active mode of travel, but the fall event emphasized walking, while the spring event emphasized bicycling. Many of the students chose the emphasized mode. Table 1 shows the percent of counts for each mode according to event emphasis. The percent of walking was greater for both events; however, there was a statistically significant difference between the two events with 17% more bicycling for the bicycling-emphasized event.

4.2. Student intercept survey response themes

Forty-five students walking or bicycling to school were surveyed on the morning of the spring SR2S event. The students were asked when they last used different transportation modes. Forty-three percent said they walked or biked to school earlier in the week, but quite a few (14%) said they had never walked or biked before (see Table 2). Many of the students (46%) said they had recently ridden to school with family, but many (51%) said they had never ridden to school with friends. In other words, the SR2S event increased the number of students traveling with other students to school.

Table 2
Previous time that students who were walking or bicycling used various transportation modes.

Mode	Earlier this week (%)	Last week (%)	Long time ago (%)	Never before (%)	Total (%)
Walk or bike	42.9	20.0	22.9	14.3	100.0
Ride with friend	11.4	11.4	25.7	51.4	100.0
Ride with family	45.7	14.3	25.7	14.3	100.0
School bus	11.4	8.6	11.4	68.6	100.0

Note: 45 students surveyed.

The students were asked why they think teachers and parents encourage them to walk or bike to school. They were not prompted with possible answers and could give multiple reasons. Most of the students (71%) said for health reasons, such as for example, “When you walk you burn some energy and you get your muscles pumping and it's just really good for you.” Another common (45%) response was for environmental reasons with comments such as “If everybody uses cars, driving alone, and don't share [rides], then they cause a lot of pollution and it could kill the earth.” Some students (23%) said saving money was a reason to walk to school with comments such as “It saves gas

which costs a lot of money." A few students (6%) noted that walking to school was a chance to have fun with their friends.

Likewise, when asked more specifically about SR2S events, the majority said they felt the events were intended to help them learn about choosing healthy travel choices, very few mentioned environmental or safety reasons. Most of the students said one of the reasons they chose to participate was for the prizes they would get from the SR2S program.

4.3. Parent survey

In general, the survey and phone interviews indicated strong community support for SR2S events. There were 17 parents who responded to the online survey. When asked to rate the overall benefit of SR2S events, the parents gave an average of 3.82 out of 5 (5 being very beneficial). Another question listed possible benefits from designated walking and bicycling days; the parents were asked to indicate which benefits they believe to be the first and second most important. The choices included the following:

- Meeting Friends/Socializing
- Educational Benefits
- Safety/Decreased Traffic
- Exercise/Health
- Support for Bicycling or Walking
- Environmental Reasons/Pollution Reduction
- Fun/Enjoyment

The benefit chosen most frequently was "Exercise/Health" to which 71% of respondents said it was either first or second most important. The next most common response was "Support for Bicycling or Walking" (35%). Surprisingly, "Safety/Decreased Traffic" (6%) and "Environmental Reasons/Pollution Reduction" (6%) were not frequently chosen as the first most important benefit.

Approximately one quarter (24%) of the parents said their children walk or bicycle to school "Only for the special Safe Routes to School Events" and over a third (41%) stated that a SR2S event at some point in the past motivated their child to walk or bike to school for the first time (the events have occurred since 2006). Additionally, 47% of parents said that their child participated in a walking school bus or bike train at an event.

Parents were asked to rate how much they agree or disagree with certain statements about SR2S events. Fig. 2 summarizes the results. Most of the parents agreed that the SR2S events enhanced their child's behavior/motivation to walk or bike to school. Likewise, most agreed the SR2S events helped their child learn about the benefits of walking or biking to school. A few parents (29%) said the events helped introduce them or their children to new walking and biking partners.

About half (47%) of the parents agreed that the SR2S events increased their or their children's awareness about other walking and biking routes (i.e. they discovered new routes or realized the feasibility of a route), while the other half was neutral or disagreed (see Fig. 2). About one-third agreed that the SR2S events increased their willingness to let their child walk or bike to school, but most were neutral (59%) and a one parent said they strongly disagreed.

A closer look at these responses reveals interesting insight; of the parents who said their child only walks to school for SR2S events, most (75%) agreed that the event increased their awareness of new routes (see Table 3). While on the other hand, most (78%) of the parents who said their child regularly walks or bikes to school were neutral. In other words, SR2S events have been a learning experience, in terms of routes, for families that usually do not walk to school, but not for families where the children already walk to school regularly.

Likewise, Table 3 shows the effect on willingness to let a child walk to school seems to depend on the frequency with which the child walks to school. For parents with children who only walk or bike on SR2S days, the majority (75%) believed the SR2S events have had a neutral effect on their willingness to let them walk to school. However, for parents with children who "sometimes" walk or bike, most (67%) said the events increased their willingness to let their child walk or bike to school. And for parents with children who regularly walk to school, most (71%) gave a neutral response. Perhaps, the SR2S events have the greatest effect on parents of "sometimes" students because the "only for SR2S events" students simply live too far away to walk more and "regularly" students will walk anyway regardless of the SR2S efforts.

4.4. Parent and community leader phone interviews

In the phone interviews, to avoid general discussion about general benefits from walking and bicycling, parents were asked (among other things) to specifically identify benefits from the SR2S events with careful focus on the day of the event. Some parents said they could not think of anything beyond the general benefits, such as health benefits or increased student alertness in the classroom. A number of parents, however, offered insightful observations. For example, one parent told the story of his daughter who insisted he let her walk to school for the SR2S event. To accommodate her wish, while recognizing the long distance from their home, he decided to drive her part way and let her walk the remaining distance. He said the experience opened his eyes to the possibility of driving part way. He noted it saved him from having to deal with traffic near the school and

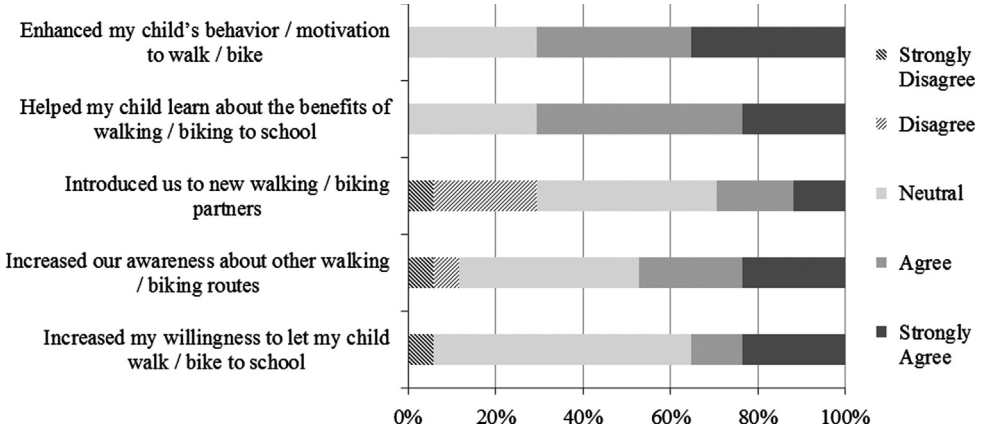

Fig. 2. Parent response to "I feel the SR2S walking and biking events resulted in the following."

Table 3
Effect of SR2S events depending on frequency child walks or bikes to school.

Frequency my child walks/bikes to school	SR2S events increased our awareness about other walking or biking routes				SR2S events have increased my willingness to let my child walk or bicycle to school			
	Disagree (%)	Neutral (%)	Agree (%)	Total (%)	Disagree (%)	Neutral (%)	Agree (%)	Total (%)
Only for SR2S events	25.0	0.0	75.0	100.0	25.0	75.0	0.0	100.0
Sometimes	16.7	33.3	50.0	100.0	0.0	33.3	66.7	100.0
Regularly	0.0	77.8	22.2	100.0	0.0	71.4	28.6	100.0

provided a means for his daughter to get exercise. Another parent said she discovered neighbors whom she had not realized could be walking partners for her child. A few parents said walking with their child on the day of the SR2S event helped them realize that the walk "wasn't so bad."

When asked how the designated days might be improved, overwhelmingly the response was to expand the events for more days—most parents said it should last for a whole week. A few parents suggested the need for more information, such as maps showing recommended routes and "kiss and walk" locations. A walk or bike to school "practice day" to explore routes and walking partners was proposed by one parent, who added that it could be held on a Saturday so that working parents who otherwise cannot participate could be involved.

The community leaders were also asked to focus on the designated days for walking and bicycling. One common theme that emerged from the interviews was the idea that the SR2S events provide a fun, community-building activity. Typically on the morning of the events, the Mayor, members of City Council, police officers, and other interested citizens make a special effort to be at the schools to cheer on the students. In the interviews, most of the community leaders noted the jubilant atmosphere that is created from the larger crowds of students and parents, big colorful posters with words of encouragement, honking car horns, and fun activities.

Furthermore, a few community leaders noted that the sheer number of students walking and bicycling, combined with extra attention and observation, helped them discover certain locations where safety could be improved, such as otherwise un-noticed street segments where sidewalks are missing and intersections where providing crossing guards would be helpful. One school principal said that while observing a SR2S event she and her staff realized the bike racks should be moved to a different location to better accommodate the students. Another school principal said because of his observations during a SR2S event he and his staff have decided to completely reconfigure the parking lot to change the flow of vehicle traffic. He said they are currently reviewing different paint striping layouts and signage to more safely direct vehicles.

A few community leaders said they think the SR2S events and their underlying message have produced broader positive changes across the city. One city council member noticed an increase in the number of youth wearing helmets while riding bicycles even on weekends. Another person said there was an increase in driver awareness of students walking to school in certain areas.

5. Conclusion

The results from this case study illustrate some of the benefits and perceived benefits from SR2S events that designate a day for walking or bicycling. The analysis was only a snapshot for one SR2S program, yet the findings revealed important trends. The number of students walking or bicycling to school showed a 100% increase on the day of the event. The numbers remained high a few weeks after the event and interviews with parents confirmed that the spring event, which was held after the coldest winter months, helped re-initiate walking and bicycling for the remainder of the year. In other words, the spring event seemed to propel students to start walking or bicycling to school a little earlier than they might have otherwise. These trends were not observed at a nearby control school that did not participate in the SR2S event.

The counts also showed a statistically significant increase in the number of parents escorting their children to school on the day of the event. SR2S leaders should use the events as an opportunity to advertise and encourage walking school buses. Likewise, SR2S leaders and school administrators should use the events as an opportunity to interact with parents and get feedback on all aspects of SR2S as well as other important issues. SR2S leaders can use the large crowds and intense observation to draw attention to particular safety issues.

A few students said the SR2S event was the first time they had ever walked or biked to school. SR2S leaders should continue to encourage families that live far away to participate in some manner, even if it means dropping their children off a few blocks from the school. They should work with school and city officials to identify and make maps for "kiss and walk" locations. Furthermore, the findings suggest the most success in changing behavior might be achieved by targeting families where the children "sometimes" walk to school.

In general, the surveys and interviews showed most parents, students, and community leaders feel the SR2S events provide important benefits. The most common benefit mentioned was improved health through active travel. Numerous studies have shown there are in fact health benefits from walking and bicycling (Pucher and Dijkstra, 2003; Mackett, 2013); however, it is difficult to translate the findings from this case study into quantifiable health benefits. In fact it is very difficult to put a dollar value on most of the purported benefits from SR2S events. For example, clearly there was a reduction in vehicle emissions and possibly some congestion relief on the day of the events, but the monetary value of those benefits is not readily clear. Likewise, there were a number of ancillary benefits that are not easily quantified. For example, the city engineer and school principals said the events helped identify and motivate safety improvements that may have otherwise gone unnoticed.

It is perhaps even more difficult to try to quantify social benefits from SR2S events. Much like a city's fireworks show, the benefits from community-building events are not easily priced. Furthermore, many of the benefits from SR2S events might not be realized for many years into the future. Most parents said they felt the events changed their child's motivation to walk to school and it is very possible that the insight their child gained will guide their behavior long into their adult lives. These long-term behavioral changes are very difficult to measure.

On the other hand, the costs are easier to quantify. For the case study, the local SR2S coordinator estimates the cost for each event, including her wage, advertising, prizes, and materials for fun games, was about $230 per school, which calculates to about $0.80 per student. If the purported benefits were to be calculated, it is very probable that they would easily outweigh the costs.

Future research should be done to quantify the benefits from SR2S activities and determine their dollar value. Perhaps longitudinal studies could be conducted to identify long lasting impacts. Future research could also look closer at some of the findings from this study. For example, is it safer for students to walk in larger groups or might a group of students be less attentive to vehicular traffic? What is the best timing of an event to encourage students to start walking again in the spring? What are the most effective ways to advertise SR2S events and increase participation?

The research design for this case study can serve as a model for other evaluation efforts in the future. For example, practitioners should seek to gather data through various means, namely quantitative and qualitative observations, student surveys, parent surveys, and interviews with stakeholders. We found that sometimes the various data sources supported each other, and other times shed a different light on certain implications. Likewise, we recommend identifying a "control" school when possible. Unfortunately, in our case study this was not considered for the fall event. The research questions and the findings from this case study can also guide practitioners in future evaluation efforts. For example, practitioners might actively seek to evaluate the extent of indirect benefits that are not necessarily intended, expected, or obvious, such as increased insight about infrastructure needs or increased face-to-face interaction between school administrators and law enforcement.

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