
Policies related to active transport to and from school: a multisite case study

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Abstract

Active transportation to and from school (ATS) is a viable strategy to help increase physical activity among youth. ATS can be challenging because initiatives require transdisciplinary collaboration, are influenced by the built environment and are affected by numerous policies. The purpose of this study is to identify policies and factors that influence ATS initiatives. Nine elementary schools in seven states participated in this case study. Sixty-nine stakeholders were interviewed. The interviews were transcribed, coded and analyzed using a master thematic codebook. This study identified two distinct aspects of policies: 'influential factors' which are factors that might impact policies related to ATS and 'policy actions' which are policies reported by people involved in ATS initiatives that directly affected their success. Influential factors included sidewalks, crosswalks/crossing guards, funding, personal safety concerns, advocacy group involvement and others. Policy

actions included policies on school speed zone, drop-off, no-transport zones, school siting, school start/dismissal time and school choice. Despite the diversity of the schools studied, similarities included influence of built environment, safety concerns, funding and transdisciplinary collaboration. Stakeholders need to work together to stimulate action and ensure successful initiatives. Influential factors appear to be important to this process.

Introduction

Opportunities for children to be physically active during the school day are becoming scarce. Many schools have reduced physical education programming and limiting or omitting recess due to increasing academic standard requirements [1]. During non-school hours, sedentary activities such as television viewing and video games often take the place of physically active play [2]. Related to increasingly sedentary lifestyles, research shows that the childhood obesity rate is reaching epidemic proportions [3,4]. Recently, there has been interest in environmental and policy approaches that can increase physical activity and decrease sedentary behavior in order to prevent childhood obesity [3]. Environmental and policy approaches are designed to provide opportunities, support and cues to help people develop healthier behaviors and are often more permanent than many programs focused on individual-level behavioral change [5]. Active transportation to and from school (ATS) initiatives are a good example of an environmental and policy approach to influence behavior change.

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ATS initiatives not only encourage children to walk or bicycle to school but also make bicycling and walking to school safer and a more appealing transportation alternative, thereby encouraging a healthy and active lifestyle from an early age. Additionally, ATS initiatives can mobilize diverse stakeholders to take part in planning, development and implementation of projects because activities that facilitate ATS may also reduce traffic volume, fuel consumption and air pollution and improve safety in the vicinity of schools.

Recognition of the importance of policy approaches for improving the health of children has led to the recent federal legislation supporting ATS. The Federal Highway Administration is charged with implementing legislation that provides funding for State Departments of Transportation to create and administer Safe Routes to School (SRTS) programs. Through these programs, communities can compete for funding for local SRTS projects [6].

Because ATS is an approach that holds promise for increasing physical activity among youth [7–9], a better understanding of policies that may promote or impede active transportation is needed. Examination of existing local, state and national initiatives that are intended to promote walking and biking to school may help guide ongoing efforts to promote active transportation [6]. The importance of increasing physical activity through active transportation is reflected in the national objectives set in *Healthy People 2010*, which are to increase the proportion of children's trips to school made by walking (≤ 1 mi) to 50% [10]. Despite the use of promotional campaigns and other activities designed to increase physical activity, children fall short of meeting this objective [10–13]. The national rate of active commuting to school is estimated at 5–14% [14,15]. One national survey showed that ATS is more common among boys than girls, and among children in lower than upper grades [16].

Notwithstanding the importance of ATS initiatives, adoption and implementation of such programs are complicated by the following factors. First, ATS initiatives require transdisciplinary

cooperation and collaboration of schools, communities and governmental agencies. In addition, they can be influenced by existing unfavorable conditions in the built environment (e.g. roads and sidewalks) that may inhibit ATS [11,13,17]. Third, ATS can be facilitated or impeded by local, state and federal policies, such as guidelines on bus transportation, funding for programs and school start times.

Policy interventions have recently been identified as an important aspect of public health efforts, including ATS initiatives [18]. Although ATS initiatives have been specifically recommended as a way to increase rates of physical activity among youth [19], no studies to date have documented the actual impact of policies that are specifically relevant to ATS. The purpose of this study is to identify policies and related factors that may influence ATS programs. Information can be used to inform ATS initiatives and provide a basis for future research.

Methodology

The Active Transport School Case Study Project was conducted by the Physical Activity Policy Research Network (PAPRN). The PAPRN was established in October 2004 as a thematic research network of the national Prevention Research Centers program funded by Centers of Disease Control and Prevention. The goal of this network is to identify which policies are effective in increasing physical activity in communities. Ten universities are represented in the PAPRN, and seven of these participated in this study.

Definitions

For this article, a policy is defined as a legislative action, organized guidance or rule that may affect the physical activity environment or the behavior of people. Policies can be in the form of written codes, standards that guide choices or common practices [18]. This study identified two distinct aspects of policies: (i) 'influential factors' which are factors that might impact policies related to ATS and (ii) 'policy actions' which are specific policies reported

by people involved in local ATS initiatives that directly affected their success.

Research of state policies

The research team investigated its own state government for relevant legislation, policies and procedures that could affect ATS. Information was collected from Web sites, personal contacts or previous research. The research team also examined state bus transportation policies.

School site selection

The researchers at each participating university submitted a list of schools to study based on the criteria developed by the PAPRN. Each selected schools had to be an elementary school and the school had to have a current or past ATS initiative (that involved more than just participation in annual Walk to School day event). In addition, the overall sample of schools had to be racially, ethnically and economically diverse. See Table I for more information on participating schools.

Interview guide development

This case study was informed by interviews with people from the schools and their surrounding communities who were involved in the schools' ATS initiatives and who were determined to have unique insights into the initiatives. A core list of representatives to interview was generated by the research team. The list included physical education teachers, principals, parent representatives, local community organizers, school officials, city officials and public safety representatives.

To allow for cross-site comparison, a list of core questions was developed and used for all interviews (see Table II). Consistent questions help in comparing interviews at each site as well as among the sites in the study. The full interview guide is available online at <http://prc.slu.edu/paprn.htm>.

Data collection

After researchers received Institutional Review Board approval, they made initial contact with a key person involved with each ATS initiative.

This person helped to generate a list of contacts for the interviews. Because the schools and initiatives were diverse, the interviewees varied slightly by research site. For example, one school did not have a physical education teacher, but had a school nurse who was active in their ATS initiative. Sixty-six interviews were conducted in person and audio recorded and three interviews were conducted by telephone. One of the interviews was conducted in Oromo, with the remaining 67 in English.

Data analysis

Data were collected during October 2005 to March 2006. Researchers at each site conducted 7–12 interviews for a total of 69 interviews at nine schools. Interviews ranged from 15–90 min in length. Each interview was professionally transcribed. Transcripts were analyzed using a common codebook, although the method for coding varied by site. Each transcript was coded by at least two people to increase reliability. Coded comments were synthesized into overall themes and these themes were further subdivided and categorized. Only themes associated with policy-related factors are reported here.

Results

Research on state policies

As of 2005, six of the seven states (California, Colorado, Massachusetts, North Carolina, South Carolina and Washington) had statewide SRTS programs or ATS policies. The State Departments of Transportation oversaw many of these programs, with support from other governmental and private agencies. Some states (e.g. California and Colorado) had budgets for projects and others (e.g. South Carolina) were non-funded policies. Missouri had no statewide ATS policy.

All but two states (California and Colorado) had a statewide policy on how far away a student must live from the school to receive bus transportation. For six states, children were eligible for bus service if they lived >1 mi from their elementary school, with some states increasing this distance for middle

Table I. Descriptions of participating schools

State	Background	Setting	No. of students	% White	% Black	% Asian	% Hispanic	% F/R ^a
Missouri	Located in a diverse, medium- to high-income area of a college town. School has high parental support for ATS and good environmental infrastructure.	Suburban	344	58	25	13	4.5	36
Massachusetts	School had first ATS initiative in 2000. Has good parental and community support. Many children live within walking distance, but the school is located in area where traffic is a concern.	Suburban	319	68.3	8.2	14.4	7.5	32.6
California	School serves a low-income student population. Has held a 'walk your child to school' program for several years.	Suburban	835	2	15	8	75	100
Washington	Located adjacent to several high-volume streets. Large population of students within the school's walk boundary.	Urban	389	7	45	27	18	91
South Carolina	School is in traditional neighborhood with sidewalks. School serves a community with high poverty rate. A large number of students walk to school. Some level of community and parental support.	Urban	247	4	92	— ^b	— ^b	96
South Carolina	School is located in a commercial area, on frontage road near a busy four-lane highway. Area has few sidewalks. School slated to close after 2005–06 school year.	Suburban	509	8	81	— ^b	— ^b	93
North Carolina	The school has sidewalks leading to it and it connects to a well-marked trail.	Urban	319	<1	80	0	19	88
North Carolina	Put in sidewalks and reduced bus routes to encourage walking to school. Traffic problems initially resulted as parents opted to drive kids to school.	Rural	712	73	23	<1	2	70
Colorado	Located in high-income area. Participated in Walk to School days since 1997. Parental involvement helped develop ATS.	Suburban	463	94	0	2	1	14

Numbers do not add up to 100% because the 'other' category for race is not reported here. F/R, Free reduced price.

^aPercentage of students receiving free or reduced price lunch.

^bNot available.

and high schools. South Carolina was unique in that only students living >1.5 mi from school were allowed bus service. Each state had provisions for exceptions to these policies such as a hazardous route (e.g. crossed a main road, no direct route).

Other state policies were identified that could affect ATS initiatives. The Washington State Traffic Safety Commission School Zone Safety grant program pays for safety education and small traffic

safety improvements. This program is funded by fines from school zone traffic violations. In addition, all school districts in Washington State are required to have a suggested active commute route plan for every elementary school. In South Carolina, state laws have been changed to allow smaller school sites, which provide more flexibility in new school placement. In California, a measure was passed in 2003 to reduce bus emissions near

Table II. Interview guide core sections^a

Introductory information	Description of interviewee position History with agency
Background ATS information	Involvement History of ATS Goals Funding Support/opposition Specific events leading to ATS Other
	Perception of ATS
	Benefits of ATS (in general and specific to school) Success Barriers Enablers Lessons learned Personal stories
	Closing
	Closing comments Recommendations for others to interview

^aSee complete interview guide booklet at <http://prc.slu.edu/paprn.htm>.

schools. Many states are also establishing School Health Advisory Councils or Task forces on Student Nutrition and Physical Activity to improve the overall health of school children and meet a federal requirement. ATS is a component of many of these councils and task forces.

Interview results: influential factors

Policies were major components of successful ATS initiatives. However, many factors discussed were not policies themselves, but acted as enablers or barriers that affected ATS initiatives. Eight influential factors were identified (see Table III).

Sidewalks

All the schools had sidewalks at least partially surrounding the school, but the mere presence of sidewalks did not always help the ATS initiatives. In two of the school communities studied, debris and garbage (e.g. old appliances, couches) blocked the pathways, and cracks in sidewalks made walking unsafe. Incomplete sidewalks were also a problem. Also the presence of fast-moving traffic near school grounds made some parents feel as though sidewalks were still unsafe. In colder regions such as

Table III. Schools (n = 9) reporting influential factors and policy actions on ATS

	Number of school reporting relevance
Influential factors	
Sidewalks	
Crossing guards/crosswalk	
Funding	
Personal safety concerns	
Advocacy group involvement	
Walk to school days	
Parking lot size and design	
Natural environment	
Policy actions	
School speed zone	
Drop-off policy	
No-transport zone	
School siting	
School start/dismissal time	
School choice	

Shaded box indicates that an influential factor or policy action was reported by a school.

Massachusetts, homeowners’ failure to shovel snow off of sidewalks and poor-quality control of trucks plowing around intersections were major barriers in the winter. Policies to improve sidewalk conditions prior to ATS initiatives or as a direct result of ATS initiatives can positively affect the acceptability of active transport.

People need to be able to walk on sidewalks and cross a busy street at a crosswalk.

City Official

I think there has to be the basic infrastructure in place, sidewalks there for the kids to actually walk on. The sidewalks that are there need to be maintained so that they’re not covered in leaves or mud or other things that would impede the kids as they’re trying to traverse.

Engineering Manager

Crossing guards and crosswalks

The most common change made among the schools studied was the addition of crossing guards or crosswalks to increase safety of active transport.

These changes were seen as comparatively low-cost solutions to some safety concerns. Many people interviewed valued crossing guards because they maintained traffic control, reassured parents of their child's safety and made children feel safer when walking. One school rallied to reinstate crossing guards after they were eliminated as a result of budget cuts.

...we lost two crossing guards. And so I spent some time trying to lobby to get them back which we didn't get back until the next year when funding came back.

Parent Coordinator of a SRTS Program

Parent volunteers serve as crossing guards at some schools. Policies that relocated or funded crossing guards and added or improved visible crosswalks helped ATS initiatives succeed.

When I'd come up [the] road in the morning, I'd see some parents walk out to the sidewalk and they could watch their child walking down the sidewalk and up to school. And then, you know, they could safely cross with the crossing guard.

School Administrator

Policies that fund, place or reposition crossing guards and policies that establish crosswalks can contribute to the success of ATS initiatives.

Personal safety concerns

Personal safety concerns were mentioned as a barrier to ATS initiatives at all schools. Many parents felt that their communities were safe, but there was still a chance that their child would be abducted or harmed by strangers.

Some parents aren't letting them walk because, you know, the safety issue. For some students walking to school, they're walking through some areas that aren't the safest in the city.

School Principal

Simple policies such as requiring that adults walk with children or organization of formal walking groups can help address this issue.

Funding

Funding for ATS initiatives was an important factor in sustainability and overall success. Some community members and legislators do not support funding for active transportation. They view local taxpayer money as better spent on roads instead of sidewalks.

And you have a lot of people who think building things for pedestrians is frivolous because everybody drives. That's their style of life and they don't see any reason to spend money on anything but streets.

City Official

Addressing this type of thinking is important for the success of ATS initiatives because funding for personnel—either a formal program coordinator, parent leaders or teachers—was seen as especially important by interviewees in this study. A program with adequate financial support also can help pay for infrastructure improvements such as sidewalks near the school.

Participation in walk to school days

Almost all the ATS initiatives in this study began with a 'Walk to School day' event that was as part of the national campaign. Walk to school events had the support of schools, local pedestrian advocacy groups and legislators. In South Carolina, however, the school districts in the study area did not initially support participation because of liability concerns. However, the successful efforts of one school prompted the school to pass its own SRTS policy prior to the enactment of the state policy.

I think what gets a little more visibility is the Walk to School Day and what we have done is used it as the vehicle to springboard other things.

Community Organizer

In that first year we actually established great partnerships ... for Walk to School Day and those partnerships still exist today.

Community Organizer

Most of the schools studied started with a successful 1-day Walk to School event, and then sought external funding via grants to expand their initiatives to promote active transport. Walk to School day events are effective in moving schools toward more systematic ATS initiatives.

Advocacy group involvement

Organizations such as WalkBoston in Massachusetts, PedNet in Missouri, Feet First in Washington, Partners for Active Living in South Carolina, GO Boulder and Bicycle Colorado in Colorado and the Diabetes Prevention Group in California all worked with the schools to provide guidance and funding. Although reasons for participation varied, these groups had the same goal: increase the number of children walking or biking to school. For example, officials at one school studied had hoped that traffic and congestion on a busy commuter road would be abated if more kids walked to school. In California, the Diabetes Prevention group wanted to reduce obesity and diabetes. Involvement of external advocates is an effective, positive influential factor in promoting and creating environmental and policy changes for ATS.

Parking lot/drop-off area size and design

Many of the schools have small parking lots making private vehicle drop-off inconvenient and causes traffic congestion on adjacent roads. At one school, officials disagreed about the advantages of an expanded parking lot. One administrator thought that an expanded lot increased walkers' safety because it mitigated traffic congestion, while another administrator believed that a bigger lot discouraged ATS.

Now we have this nice parking lot and it seems like that entices more people to drive ' cause it was easier to get the kids in and out.

School Administrator

Air pollution is another aspect of the school parking lot environment that affects ATS. Specifically, idling automobiles and school buses make schools

one of the places with the poorest air quality during and immediately after drop-off and pick-up times. At four schools, interviewees mentioned the need for more policies to regulate air quality in the parking lots.

Schools are one of the most air polluted parts of the city because you typically get lines of cars and buses just crawling along over a period of about an hour dropping off or picking up kids—I mean, it's terrible really, and the kids are supposed to learn and live in that environment all through the school day.

Local Organizer

Careful design of pick-up/drop-off areas and parking lots are important influencing factors for ATS. Policies that physically separate pedestrian and bicyclists from the queue of cars waiting to pick up or drop off children would improve safety, and policies that prohibit idling vehicles may make the air quality better for those walking through the drop-off areas into the schools.

Natural environment

Factors in the natural environment can impact a school's ATS initiative. Topography, terrain and weather can all influence a school's decision to promote ATS. For example, a canyon adjacent to one school was a natural hazard and a haven for homeless people and drug activities. Despite these dangers, children often used the canyon as a shortcut to and from school. The state SRTS program provided funding for a colorful fence to block the entrance to the canyon as a temporary means to deter children from using it. Another school noted that the sloping terrain near the school was perceived as particularly dangerous because it affected drivers' ability to see children crossing. Schools located in regions of the United States with frequent snow and ice have unique barriers to overcome. Although children still walked to school during 'Polar Bear Month' in Massachusetts, their efforts were thwarted at times because of poor-quality control for snow plowing on streets and lack of enforcement of property

owners' requirement to shovel sidewalks. Numerous aspects of the natural environment can negatively influence ATS; creative solutions and policies that address these factors are needed for successful ATS initiatives.

Interview results: policy actions

This study identified six policy actions that directly impacted ATS initiative success (see Table III).

School zone speed limit and enforcement policies

Interviewees reported that many streets around the schools in this study had heavy traffic, especially during the morning commute. They noted that efforts were made to improve the safety of school-aged pedestrians. All but one school reported that school speed zones already existed or were improved or developed as part of an ATS initiative. The presence of school zones alone may not be enough to make active commuting safer. Despite efforts by police, crossing guards and automated controllers, many motorists do not obey posted school zone speed limits. Policies to enforce speed limits are an important aspect of overall pedestrian safety. Several schools worked with local police department traffic units to increase enforcement around the school during peak hours and to conduct presentations on pedestrian safety to the students. One school incorporated pedestrian safety into physical education classes.

Five schools noted that enforcement of the speed limit by speed signs and traffic regulators and assessment of traffic speed around the school were key aspects of their ATS initiative and helped reassure parents about the safety of their children's commute. Despite these safety efforts, some parents and administrators still perceive streets as dangerous for pedestrians. At one school, trucks were banned from the school road.

Trucks going through there made it a whole lot let's say more dangerous... the city requested to actually pass an ordinance, limiting trucks on there.

Regional Department of Transportation Coordinator

Traffic is dangerous. Would I allow my own child to walk to school? I probably would not.
School Board Member

Even with the sidewalks [it doesn't] necessarily feel as inviting to walk down when you [have] trucks going down there at 45 miles an hour.

School Official

It's a huge problem because the corners aren't safe. There have been three kids hit in these last 12 months I should say.

Community Organizer

On the road that this [school is] on there was a child that got hit crossing the road going to a little store that's probably, oh, three city blocks away from the main entrance to where the school's located. And the child had some head injuries. It was not at all life threatening, but they were pretty serious injuries that made more awareness about walking to the schools....

Planning Director

At one school where a child was hit by a car, the incident solidified support by the principal for the ATS initiative and called for increased pedestrian safety and awareness.

Drop-off policies

School policies on managing student drop-off can be a barrier or enabler to an ATS initiative. All schools had designated areas for buses and private vehicles to drop-off students. Two schools had policies requiring school personnel to direct bus traffic and viewed this as an important aspect of drop-off safety.

At many of the schools, private vehicle drop-off procedures caused congestion on already crowded streets.

I've heard people say, 'I am not gonna let my kid walk to school. There are too many cars out there' so they get in their car. You know, and just add to it.

Community Organizer

Drop-off policies that allow cars or buses to block sidewalks or entrances to schools also can be a danger for children walking into the school.

And people are stopping to get their kids and stopping in various places so kids are sometimes running in front of cars or sometimes cars are stopping in front of other cars and just staying there and getting people angry. It's a system that is not functioning properly.

Community Organizer

No-transport zone establishment

'No-transport zones' are areas where bus service is not provided because children live too close to the school. These policies can be set by states or local schools and districts. Theoretically, if students live close and lack bus service, active transport would be a viable option. At two schools studied, this was the case, especially on designated Walk to School days. However, at two other schools, this policy only caused more people to drive their children to school creating more traffic congestion.

At several of the schools, students who could not participate in Walk to School days because of distance or hazards were dropped off in specifically designated areas where they could then walk the remaining distance to school. Some schools called these 'staging areas' or 'drop areas'. Schools worked with local businesses to develop policies to use their parking lots for this purpose.

School siting policies

Some interviewees noted that school siting policies were an important consideration in ATS initiatives. In particular, school officials have to consider factors such as traffic speed, traffic congestion, terrain around the school and school distance from neighborhood residence when deciding on where schools should be located.

Neighborhood schools are a thing of the past. They are building larger schools that draw from a larger geographical region to save on resources.

School Board Member

At one school in the study, the only entrance faced a busy five-lane street and faced away from the neighborhoods from which most children walked. Another school was built and opened before road and sidewalk construction was complete, making walking to school impossible.

School start/dismissal time policies

In areas where elementary schools start class later than when most parents leave for work, ATS initiatives were challenged. Most parents do not want to leave younger alone to wait until it is time to walk to school. Before school day, care and bus service are the most convenient options for these parents. Additionally, dismissal times can also influence ATS initiatives.

Probably one thing to help walkability to school is the change in school hours. Elementary schools don't start until 8:45. Now that's a problem for parents.

Public Safety Official

In one school, walkers were dismissed 10 min earlier than those who rode the bus. This gave walkers a chance to get out before the height of school dismissal traffic.

I think they even had a special dismissal for walkers so that they could get out of the traffic quicker. If you can get out of school a little sooner, it might encourage you.

Maintenance/Transportation Director

School choice policies

In some areas, school attendance is based on choice rather than proximity to the school. In one school district in Washington, students can choose to attend a school that is outside of their neighborhood school. This policy is also true in South Carolina and California for schools that fail to meet requirements of the federal 'No Child Left Behind Act'. In Missouri, students can attend magnet schools within the district. These students may be likely to live too far away for ATS. To overcome this

barrier, one magnet school in Missouri has its buses drop the children off 0.25 mi away from the school so they can partially participate in ATS.

Discussion

Despite the diversity in the nine schools studied, there were more similarities than differences in the influential factors and policy actions of ATS initiatives. Four major similarities were identified. First, all schools needed a built environment more conducive to ATS. Even schools with adequate sidewalks and good locations in terms of proximity to neighborhoods still had plans to widen sidewalks or improve routes to school. Subsequently, policies to improve sidewalks, parking lots or surrounding areas were a common theme. This finding is consistent with past research. Boarnet *et al.* [20] studied urban form changes and children's active transportation to school and found that improvement projects such as sidewalks, traffic lights, pedestrian crossing improvements and bike paths can increase walking or bicycling to school. In a national study on ATS in children grades 4–12, Fulton *et al.* [16] found that the presence of sidewalks was the main modifiable characteristic associated with ATS.

Concern over safety was another common theme. For all schools, interviewees expressed concerns about traffic and speed limits. Implementing and enforcing policies to improve road safety was a strong priority in the ATS initiatives studied. Differences in school setting had little relationship with the level of parental concern for safety. In this study, even parents whose children attended schools in upper-middle class suburban areas still had safety concerns with respect to strangers. Safety concerns have been shown to be an important barrier to ATS in adolescents [21] and minority children [11,22]. All the ATS initiatives in this study addressed this issue with policies that promoted the personal safety of those children walking to and from school.

The third common theme across research sites was the need for funding for three main areas: per-

sonnel, program materials and improvements to the built environment. Funding for personnel is necessary to increase initiative sustainability. Although volunteers are a driving force behind many of the ATS initiatives studied, paid coordinators, parents or teachers make initiatives more permanent, especially if key volunteers move out of the area or stop participating. Funding also is needed for program materials, such as incentives or rewards, maps, promotional items or snacks to make initiatives more child-friendly. The third area of funding is the most costly. Permanent improvements to the built environment include sidewalks, parking lots or fences. These modifications are expensive, but essential components to ATS. They may require coordination between different groups and funding from grants, and donations, especially when local governments are operating under tight budgets. One potential funding opportunity is the nationally established STRS. The SRTS program was established in August 2005 as part of the most recent federal transportation reauthorization legislation—SAFETEA-LU. This law provides multiyear funding for the surface transportation programs that guide spending of federal gas tax revenue. Section 1404 of this legislation provides funding (for the first time) for State Departments of Transportation to create and administer SRTS programs, which allow communities to compete for funding for local SRTS projects. As of 2007, most states have a full-time SRTS coordinator to aid in the distribution of these funds [23]. Additionally, this law states that 10–30% of the funds allocated to the state must be used for non-infrastructure activities (e.g. education, encouragement and enforcement), while 70–90% of the funds must be spent on construction projects such as bike lanes, trails, paths, sidewalks, etc. [6].

The final common theme identified was that all the ATS initiatives relied on a collaboration of many organizations and individuals, requiring leadership and cooperation. This collaboration is typical of community change projects [24]. Schools in this study partnered with advocacy agencies, government entities and community groups at each of the research sites. Representatives from each of

these groups played a role in identifying influences and implementing policy actions that promoted ATS. Leadership and cooperation were key enablers to success. Published case studies of early ATS initiatives in California, Michigan and Texas show collaboration among transdisciplinary partners as an integral aspect of each program [6]. For example, beginning in 1998, the Texas Department of Transportation awarded a grant to a non-profit organization to implement a bicycle/pedestrian traffic safety curriculum. Members of this coalition worked with government officials, school administration, teachers and other community members over several years to successfully disseminate this program [6]. One reason for the similarity in results across our diverse sample was that this study focused on schools with a current or past ATS initiative. Regardless of where the school was located, ATS initiatives had advisory committees, school involvement and other factors in place that contributed to initiative success.

In addition to the similarities identified, a few policy differences emerged. Different states and districts have different busing and school choice policies, which can impact the effectiveness of ATS initiatives. Depending on the population demographics, density and economic growth of an area, site selection policies for new schools can have an impact on both busing and school choice. Nationally, the number of schools in the United States decreased by ~1000 in the past 40 years, while the number of students increased by >2 million [25]. Larger schools located further from home are becoming more common than local neighborhood schools. Geographical differences also require unique ATS strategies. For example, the schools in this study were in different regions of the United States and while San Diego has year-round weather conducive to ATS, cities such as Boston have to contend with >80 days of precipitation on average per year. Weather was cited as one of the main barriers to walking or biking to school in a recent survey [26]. And ATS initiatives in places where inclement weather might impede participation have to make accommodations for this barrier. Another difference noted in this study was that policies may

be affected by local cultural factors. For example, several study sites (e.g. Columbia, MO) already had a reputation as being highly walkable, and citywide programs to promote active transport had already been in place. These schools had an easier time getting ATS promoting and garnering support for ATS initiatives those located in areas where automobiles are the preferred mode of transportation.

Limitations and strengths

Several limitations of this study warrant mention. First, methodology included coding at each site instead of centralized coding (i.e. one site coding all transcripts). However, each researcher was trained in coding and used a common codebook. The benefit of having people knowledgeable about the schools and local areas was an advantage that outweighed the benefits of one research site completing all the coding. Another limitation is that this study did not interview children. Because this study focused on policies and not necessarily program components, information was gathered only from adults. Interviewing children about effective program components could be a worthy approach for future studies. A final limitation is that this study did not evaluate schools without initiatives or schools who had initiatives that were not sustained.

In spite of these limitations, this study has several strengths. First, this is a unique study because it identifies policies (e.g. school, community, written/unwritten) and influences of ATS initiatives. In addition, the sample was drawn from diverse regions and states across the United States, which suggests that the common themes and findings are meaningful. A final strength is that this study incorporated the perspectives of multiple stakeholders who can influence the success of these initiatives.

Conclusion and recommendations

The schools in this study all implemented ATS initiatives with varying degrees of success. The

influential factors and policy actions identified may directly or indirectly affect future success. Based on our findings, we recommend that ATS initiatives consider the following:

- Collaboration: Establishing policies is a collaborative effort. School personnel need to have effective relationships with public safety officials, city officials, parents and school district representatives in order for policies to be enacted and enforced.
- Safety: Policies that address safety, related to personal safety and traffic safety (e.g. speed zones, drop-off policies and safe routes promotion) are paramount.
- Policy context: ATS initiatives must take into account relevant state and local policies (e.g. bus policies, school start times, school choice) that might affect success.
- Influential factors: Factors such as infrastructure, crossing guard/crosswalk status, geography of the surrounding area or weather can be an important catalyst or inhibitor for policy development. Addressing these proactively can benefit the initiative.

Regardless of whether the goals of ATS are related to health, traffic control or clean air, many stakeholders need to work together to stimulate action and ensure successful programs. Influential factors appear to be important to this process. These influences are identified in this qualitative multisite case study, which is a good starting point for other larger studies using broad, quantitative data collection techniques. Intervention and case-control studies also should be conducted in a diverse population of schools to generate the most robust, generalizable results.

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Conflict of interest statement

None declared.

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