JOURNAL OF SCHOOL HEALTH

RESEARCH ARTICLE

Youth Walking and Biking Rates Vary by Environments Around 5 Louisiana Schools

JEANETTE GUSTAT, PhD, MPH[a] KATHERINE RICHARDS, MPH[b] JANET RICE, PhD[c] LORI ANDERSEN, MEd[d] KATHRYN PARKER-KARST, PhD[e] SHALANDA COLE, MBA[f]

ABSTRACT

BACKGROUND: The prevalence of obesity in children is high, and many do not meet physical activity recommendations. The Safe Routes to School (SRTS) program encourages school-aged children to walk and bike to school. We assessed the condition of the walking/biking environment around schools in Louisiana prior to the state's first SRTS program.

METHODS: Assessments were made at the neighborhood level with the Pedestrian Environmental Data Scan (PEDS) instrument, and at the school and individual levels using the National SRTS Center's teacher tallies and parent surveys. PEDS scores were developed to rate conduciveness to walking/bicycling of proposed SRTS routes. Sites' scores were compared with the percentage of students who walk/bike to school. Five schools in Louisiana were evaluated.

RESULTS: Overall, more students walked (range: 2.4-17.4%) than biked (range: 0.3-4.5%) to school with more students walking home than to school. Predictors of walking/biking to school include distance from school, speed of traffic, school encouragement, and if a student asked permission. Sites with the highest PEDS score had the highest percentage of students who walked/biked to school.

CONCLUSIONS: There is a role and a need for the SRTS program. The environment and other factors influence biking and walking to school.

Keywords: childhood obesity; physical activity; environment design; transportation.

Citation: Gustat J, Richards K, Rice J, Andersen L, Parker-Karst K, Cole S. Youth walking and biking rates vary by environments around 5 Louisiana schools. J Sch Health. 2015; 85: 36-42.

Received on August 30, 2013
Accepted on June 24, 2014

Obesity rates in Americans have grown rapidly in the last 30 years.[1] For children of 2-19 years of age, 31.8% are considered at risk of overweight or obesity. Rates vary by race, sex, and ethnic group with over 39% of African American and Hispanic children at risk for overweight and obesity.[2] In Louisiana, rates are higher than the national averages with over 35% of children 2-19 years overweight or obese.[3]

Having an active lifestyle is one way to combat obesity and making healthy, active choices in youth is a way to form a lifetime of good habits. Physical activity guidelines recommend that children and youth participate in at least 60 minutes of physical activity every day.[4] Walking and biking as part of an active transportation plan is one way to increase physical activity.

Because of the sky-rocketing obesity rates, experts have looked to ecological approaches to combating obesity. Community planners, policymakers and public health experts can design changes in the built environment to make physical activity safer, more attractive and convenient in communities. Much research has been dedicated to examining built environment characteristics that facilitate physical activity, but is often limited to adult populations.[5] Although the American Academy of Pediatrics has recommended that communities be made more accessible for walking and biking for children,[6] school active transport rates have significantly declined over the past few decades.[7] One particular comparative analysis examined trends in active transport among American children from 1969 to 2001 and found that active transport rates have declined from about 40% to 13%.[8]

The National Safe Routes to School (SRTS) program, administered by the Federal Highway Administration,

[a]Clinical Associate Professor, (gustat@tulane.edu), Department of Epidemiology, Prevention Research Center, Tulane University School of Public Health and Tropical Medicine, 1440 Canal Street, Suite 2000, New Orleans, LA 70112.

[b]Clinical Research Manager, (krichards@fhi360.org), FHI 360, 359 Blackwell Street, Suite 200, Durham, NC 27701.

[c]Associate Professor, (jrice@tulane.edu), Department of Biostatistics and Bioinformatics, Prevention Research Center, Tulane University School of Public Health and Tropical Medicine, 1440 Canal Street, Room 2023, New Orleans, LA.

was established in 2005 to promote safe walking and biking to school.[9] The program was designed to enable and encourage school-aged children to walk and bicycle to school, to make walking and bicycling safer and appealing to encourage healthy lifestyles, and to improve safety and reduce traffic around schools. In 2005, the program dedicated $612 million to states over a 5-year period with no state receiving less than $1 million per year. Funds can be used for both infrastructure projects and non-infrastructure activities that promote active transportation to school. Some of the most reported barriers to active transportation are concerns for safety and convenience,[10] and SRTS funding is able to provide opportunities to overcome these barriers. Various SRTS programs have been evaluated and seen positive results from the SRTS improvements. One particular study found an association between urban design changes and increased active transport to schools.[11] Another study observed increases in walking when sidewalk and traffic signal improvement projects were completed with SRTS funds.[12] These results suggest that other communities may benefit from SRTS programs.

In 2007, Louisiana funded its first SRTS programs. The purpose of this study was to examine baseline characteristics associated with walking and biking in school-aged children at the Louisiana SRTS funded sites.

METHODS

Louisiana awarded 10 SRTS projects to sites throughout the state in 2007. Awarded applications often contained projects for more than 1 school location, yet only the school that had applied for funding was evaluated in this study. The SRTS-awarded projects are located throughout Louisiana. Upon review of the applications, consultation with the state SRTS Coordinator and school staff responsiveness to information requests, 5 SRTS-awarded project sites were chosen for inclusion in this study. Sites were selected based on responsiveness and geographic diversity around Louisiana. An additional SRTS-awarded project site was chosen for the pilot. The pilot site had students from fifth to eighth grade in Napoleonville, Louisiana, with a school population of 349 students. This site was selected as a pilot location due to its central location in the state and responsiveness to participation. The other SRTS-awarded sites ranged from PK through eighth grade and the communities had similar median incomes. The project site information can be seen in Table 1. Due to a limited budget and time frame for the study, the remaining 4 SRTS sites were not evaluated.

Instruments

Parent survey and teacher tallies. The National Center SRTS established an evaluation protocol that includes a parent survey and teacher tallies of children.[13] Teachers are recommended to query students regarding their mode of transportation to and from school and tally the results. Previous studies have demonstrated that the evaluation tools used in this study have a high degree of validity and reliability.[14] The parent survey asked parents to report their child's usual travel mode to and from school, travel time to and from school, grade allowed to walk or bike to school, as well as barriers to walking or biking to school. For study-specific data collection, we included additional questions to the parent survey to address car and bicycle ownership, safety aspects near the school and in the child's neighborhood, and details about the route the child takes to get to school.

Environmental audit tool. The Pedestrian Environmental Data Scan (PEDS) tool was used to assess environmental features and safety concerns of the walking and biking environment surrounding the SRTS program site.[15] The features the PEDS tool assesses include type of pedestrian facility, path material, obstructions, sidewalk continuity, connectivity and condition, road condition, lanes, speed, parking, driveways, crossing aids, way-finding aids, shade, cleanliness, degree of enclosure, bicycle lanes, and transit facilities. The research team designed an electronic layout using Visual CE software and loaded it on a PDA GPS device for use in the field.

Participants

Participants included a total of 844 parents of students from the selected SRTS project schools who

[d]PhD Candidate, (Landerse@tulane.edu), Department of Global Community Health and Behavioral Sciences, Tulane University School of Public Health and Tropical Medicine, 1440 Canal Street, Suite 2301, New Orleans, LA 70112.

[e]Executive Director, (kate@marketumbrella.org), Market Umbrella, 200 Broadway, Suite 107, New Orleans, LA 70118.

[f]State Coordinator, (shalanda.cole@la.gov), Louisiana Department of Transportation and Development, Lousiana Safe Routes to School Program, 10 Veterans Blvd., New Orleans, LA 70124.

Address correspondence to: Jeanette Gustat, Clinical Associate Professor, (gustat@tulane.edu), Department of Epidemiology, Prevention Research Center, Tulane University School of Public Health and Tropical Medicine, 1440 Canal Street, Suite 2000, New Orleans, LA 70112.

This publication is a product of a Prevention Research Center and was supported by Cooperative Agreement Number # 1-U48DP001948 from the Centers for Disease Control and Prevention. The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention. The authors would also like to thank the schools partnerships for their support to the project.

Table 1. **Demographic Characteristics of the SRTS-Awarded Sites**

SRTS-Awarded Site Locations	Parish Population*	Parish Median Income*	Grade Levels	Number of Studentsv at Selected School	Response Rate† (%)
Lockport (Lafourche Parish)	89,974	$31,168	Sixth to eighth	424	32.2
Walker (Livingston Parish)	91,814	$34,910	Sixth to eighth	720	45.7
Bossier City (Bossier Parish)	98,310	$39,203	PK to fifth	563	42.1
Vinton (Calcasieu Parish)	183,577	$35,372	PK to fifth	485	36.45
Franklin (St. Mary Parish)	53,500	$28,072	PK to fifth	235	38.9

*As determined from the 2000 census data.
†Parent survey response rate.

completed the SRTS parent survey.[13] The parent surveys had return rates of 32% to 46% over the 5 schools.

Teacher tally completions ranged from 40% to 84%. Although return rates for the teacher tallies were higher than the parent surveys, the totals for the teacher tallies did not match school records for attendance that day so the teacher tallies were not used in this analysis. Walking and biking trends indicated by the teacher tallies mirror the trends of the parent survey results.

Procedures

Data collection occurred between April and May 2009. Although sites were selected for SRTS awards in 2007, none had received statewide funds until after 2009. The protocols and procedures were tested in the pilot community. Procedures and survey return rates were found to be acceptable and ranged from 32.2% to 45.7%.

Each school distributed the parent survey to all K through eighth-grade students on Monday, and all surveys were to be returned to the principal's office the Friday of the same week under recommendation from local school staff. The schools were encouraged to provide an incentive to the students for them to return a completed parent survey. Of the 5 schools, 3 offered a ''dress code'' pass, 1 provided a $50 Wal-Mart gift card raffle, and one offered a pizza party for the 3 classes that had the highest return rates. These incentives were discussed and agreed upon with the principal and/or assistant principal.

The National Center instructions for the teacher tallies called for 2 separate tallies conducted each day: 1 in the morning and 1 in the afternoon. However, teachers may have a different class in the morning than in the afternoon, depending on the daily class schedule and classes taught. It was assumed that a child was likely to know each morning how she/he would be leaving from school the same day. Prior research has confirmed students' ability to predict travel home from school.[14] Therefore, in an attempt to ease the administrative burden on the teachers, the research team amended the teacher tally instructions, so both AM and PM counts were conducted in the morning during roll call. Study staff communicated with schools and reviewed instructions as necessary the week the surveys were distributed and tallies were to be conducted.

With the SRTS grant, each site proposed improvements to the route(s) children take to school. These improvements included repair or installation of sidewalks, completing or making crossings safer, fixing drainage issues, and changing signaling.

Maps were generated of the areas surrounding each school, and the school administrative personnel identified the geographic locations and clustering of student residences, with a focus on the current walkers/bikers. After discussion with the school staff about the routes children took to school, the most frequently used routes to school as well as the SRTS grant-proposed route were identified on the maps. The data collector toured the surrounding areas by car to identify new housing developments and other land-use areas that may affect the routes of students. The commonly used routes as well as the proposed route for each site's SRTS grant were selected for the PEDS audit. The data collector selected additional routes from the driving observations. This resulted in at least 2 routes for the PEDS audit for each site. Routes were broken down into segments consisting of either 1 block or 700 feet, whichever was a shorter distance, in accordance with the established PEDS protocol.[14] There were no minimum or maximum numbers of segments required per route.

Data Analysis

Frequencies were computed and Pearson's chi-square test was used to determine differences between the percent of children who walk and/or bike to school and various factors including distance from school, travel time to school, if the student asked permission to walk/bike to school, if the school encourages walking/biking, and if the student recognizes most people on their block. A p-value less than .05 was considered statistically significant.

Variables that were significantly associated at the bivariate level with walking or biking to and/or from school were included in a multivariate logistic regression model predicting walking or biking to

and/or from school. We used the forward stepwise likelihood ratio method with entry set to .05 and removal set to .10.

Scoring of PEDS instrument. The selected segments (N = 69) received the full PEDS audit. Frequencies and means for each of the variables were computed. After reviewing the SRTS proposals, relevant environmental variables were selected for inclusion into the score. Variables were then recoded into dichotomous variables to reflect desired environmental or safety features [present (1) vs. absent (0)]. Frequency distributions were computed for the total segments for each variable. An initial score was created by summing the number of items coded 1 for each segment. To assess internal consistency, the mean PEDS score of the segments with the desired feature was compared with the mean PEDS score of the segment without the feature present. Variables had to demonstrate a mean difference greater than 1 unit to remain in the final score. Scores ranged from 1 to 10 with a higher score indicating a greater number of desired features within a segment.

RESULTS

Over half of the students were in the younger grades K-5 (54.5%) and were girls (55.2%) (Table 2). Just over half the parents had at least a college degree (52.1%) and the majority of parents owned more than 2 cars. Over 76% of students owned a bicycle and 40% of students lived less than 1 mile from school. Sixty percent of the students at all the schools lived more than 1 mile from the school and 25.8% lived less than one-half mile from school.

Overall, more students walked (range: 2.4-17.4%) than biked (range: 0.3-4.5%) to school with more students walking home than to school (data not shown). Distance lived from school varied by city with just under 12% in Walker, 29% in Lockport, 43% in Vinton, 50% in Franklin, and 78% in Bossier City of students living within a 1-mile radius of their respective school (data not shown). Bossier City, Lockport and Vinton had higher percentages of students who walked or biked to school.

Variables that were significantly related to walking or biking to school included distance ($p < .001$), travel time ($p < .001$), permission ($p < .001$), school encouragement ($p < .001$), and recognizing most people on the block ($p < .05$) (Table 2).

In a multivariable model, living less than one-half mile from school, a parent reporting distance to school as a factor affecting the decision to allow child to walk/bike to school, a child's school encouraging walking or biking, and if the student asked permission to walk or bike to school in the past year were significantly associated with the increased likelihood of a child actually walking or biking to or from school (Table 3). Students were 2.6 times more likely to walk or bicycle if the school promoted it (CI: 1.36-5.07). Students who lived less than one-half mile away were 16.7 times more likely to walk/bicycle to school than those who lived farther away (CI: 6.81-41.16) (Table 2). In addition, if a student asked permission to walk or bike to school in the past year, they were over 7 times more likely to walk or bike to school (CI: 3.434-14.86). The speed of traffic was reported by parents as a significant factor associated with fewer children walking or biking to or from school.

Table 4 shows the variables in the final PEDS score and the means for each feature included. Mean values range from 1 to 10. The majority of the path segments were in poor condition (62.3%), had obstructions

Table 2. **Demographic Characteristics of Parent Survey Respondents**

School, City	N (%)	% Walk/Bike
Lockport Middle School, Lockport	113 (13.4)	15.0
Westside Jr. High School, Walker	271 (32.1)	3.3
Meadowview Elementary School, Bossier City	216 (25.6)	21.8*
Vinton Elementary School, Vinton	153 (18.1)	12.4
Lagrange Elementary School, Franklin	91 (10.8)	4.4
Grade of student		
K to fifth	460 (54.5)	15.2*
Sixth to eighth	384 (45.5)	6.8
Sex of student		
Boys	378 (44.8)	13.2
Girls	465 (55.2)	9.7
Highest grade completed by respondent		
Elementary thru High School	374 (47.9)	10.7
College or more	407 (52.1)	10.8
Distance student lives from school		
> 1 mile	457 (60.0)	2.0
Half to 1 mile	108 (14.2)	9.3
< Half mile	196 (25.8)	36.2*
Number of cars owned or leased		
None	29 (3.6)	17.2
1 car	246 (30.1)	11.8
2 cars	373 (45.7)	10.7
3 or more	168 (20.6)	12.5
Student owns a bicycle		
Yes	629 (76.4)	12.4
No	194 (23.6)	8.2
Student asked permission to walk/bike		
Yes	249 (30.1)	31.3*
No	579 (69.9)	2.4
Travel time to school		
< 5 minutes	145 (19.2)	23.8*
5-10 minutes	214 (28.4)	14.6
11-20 minutes	219 (29.1)	5.8
> 20 minutes	176 (23.3)	2.2
School encourages walking/biking		
Positive	115 (14.6)	28.7*
Neutral/Negative	673 (85.4)	8.6
Recognize most people on the block		
Positive	494 (60.2)	13.4†
Neutral/Negative	327 (39.8)	8.6

*$p < .001$; †$p < .035$.

Table 3. **Predictors of Children Currently Walking or Biking to and/or From School***

	Total N	% Currently Walk/Bike	OR	95% CI	p-Value
Distance student lives from school					
>1 mile	457	2.0	1		
Half to 1 mile	108	9.3	2.648	(0.867, 8.085)	.087
<Half mile	196	36.2	16.74	(6.807, 41.162)	<.001
Distance as a factor†					
Yes	547	16.2	2.218	(1.194, 4.12)	.012
No/missing	297	8.8	1		
Speed of traffic as a factor					
Yes	519	7.5	0.42	(0.232, 0.758)	.004
No/ missing	325	17.5	1		
Child's school encourages walking or biking					
Positive	115	28.7	2.625	(1.359, 5.071)	.004
Neutral/ negative	673	8.6	1		
If the student asked permission to walk/bike in past year					
Yes	249	31.3	7.141	(3.43, 14.864)	<.001
No	579	2.4	1		

*Forward stepwise logistic regression.
†Reported by parents as a factor affecting parental decision to allow child to walk/bike to school.

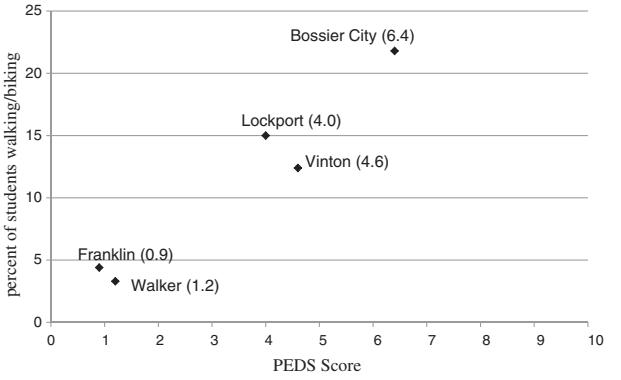
Table 4. **PEDS Score Components for Path Segments**

Feature	Score per Segment	% Segments (N = 69)	Mean PEDS Score (SD)
Pedestrian facility	0—None	44.9	1.03 (0.55)
	1—Sidewalk	55.1	6.21 (1.71)
Path condition	0—Poor	62.3	2.02 (1.86)
	1—Fair	37.7	6.96 (1.18)
Path obstruction	0—Obstruction present	75.4	2.83 (2.49)
	1—None	24.6	7.12 (1.22)
Buffer between road and path	0—None	49.3	1.53 (1.54)
	1—Buffer present	50.7	6.17 (1.92)
Sidewalk width	0—<4 feet	63.8	2.09 (1.84)
	1—>4 feet	36.2	7.04 (1.27)
Sidewalk completeness	0—Incomplete	58.0	1.88 (1.80)
	1—Complete	42.0	6.66 (1.52)
Sidewalk connectivity	0—3 or fewer connections	79.7	3.09 (2.65)
	1—4 or more	20.3	7.00 (1.36)
Crosswalks	0—none	69.6	2.94 (2.55)
	1—1 to 2	30.4	6.05 (2.52)
Bike facilities	0—None	97.1	3.76 (2.86)
	1—Bike facility present	2.9	8.00 (0.00)
Overall cleanliness	0—Poor	11.6	2.00 (2.73)
	1—Fair	88.4	4.13 (2.86)

SD, standard deviation; 1, desired feature present; 0, desired feature absent.

(75.4%), incomplete sidewalks (58.0%), lacked connectivity (79.7%), lacked crosswalks (69.6%), and had no bike racks (97.1%). However, most had a sidewalk present (55.1%) and had a fair or good level of overall cleanliness (88.4%). The final score is a reflection of overall ease of pedestrian use for a segment.

Figure 1. **Mean PEDS Score per Site by Percent of Students Who Currently Walk or Bike to and/or From School**



The mean PEDS scores for the total segments for each city are shown in Figure 1 and range from a high mean score of 6.4 in Bossier City to a low of 0.9 in Franklin. Sites with the highest PEDS score had the highest percentage of students who walked or biked to school.

DISCUSSION

This baseline assessment of the SRTS projects in Louisiana shows that there is a relationship between the percentage of students who walk or bike to school and features of the environment that are supportive of those activities. The highest rates of active transport were found in communities that had the highest PEDS evaluation scores, suggesting sites with higher environmental and safety features that support active transport are more likely to experience higher rates of walking and bicycling. Previous research has identified that when the built environment is conductive to physical activity, increased rates of activity will be seen.[5,11,12,16,17]

The safety features of the various environments and the scoring system we developed helped to summarize across all the segments on all routes for a site and indicated opportunity for improvement. Future changes through SRTS grants may be able to address these environmental features which, in turn, could improve rates of active transportation to school. Other literature has shown the relationship between increased rates of active transport due to SRTS improvement programs.[11,12,18]

In addition, this study identified several characteristics associated with increased likelihood of active transportation. Distance to school was associated with increased likelihood of walking or biking to school. Specifically, students who lived less than one-half mile from the school were more likely to walk or bike to school. Previous research suggests that distance is a

factor affecting their decision in allowing their children to walk or bike to school, and this study is consistent with those findings.[19-21] Minimum bussing distance laws may be a way of encouraging students to walk or bike to school, and research suggests these laws can increase the proportion of students walking and biking to school.[21]

Our findings also indicate that parents' perception of school encouragement for active transport can serve as a significant predictor of the percentage of children that walk or bike to school. A previous study identified popular interventions where schools can act as supports to active transport; these included safety education, special events, infrastructure improvements, and walking buddies.[22] Schools have an opportunity to utilize improvements from SRTS to promote active transportation and encourage parent involvement in increasing the acceptability of active transportation. Other successful SRTS school sites have offered promotional events such as ''International Walk to School Day'' and formed walking school buses and bike trains to support active transportation.[23]

We also found that if a child recognized most people on the block, they were more likely to walk or bike to school. This variable could represent perceptions of neighborhood safety, as well as neighborhood social support. This finding highlights the importance of the social environment in active transportation, conducive with the socio-ecological model.[24] Studies in Australia and the United Kingdom also have highlighted the importance of the social environment as a facilitator of active transportation.[25,26]

This study also highlights traffic speed as a barrier reported by parents to active transportation to and from school. Many other studies have shown similar results and identify other barriers including lack of sidewalks.[27,28] Permission from parents was predictive of active transportation to school and is indicative of parental attitudes toward travel. Wen et al[29] suggest that parental attitudes influence active transportation. In their study, parents of children who were driven to school were more likely to believe their child did not have road safety skills, as well as perceive the roads on the way to school as being dangerous.[29] Schools can use the opportunity through the SRTS project funds to address some of these deficits such as changes to the environment like the installation of traffic calming devices and additionally foster attitude change within the parental community.

Strengths and Limitations

This study involved several limitations. The use of self-report data at the individual and school level such as teacher tallies is inherent to biases of the individual. However, previous research has identified that these measures are likely an appropriate method for this information.[14] Although we received a high percentage of returned teacher tallies, totals did not match school attendance records for the corresponding day. Teachers may have benefitted from incentivizing data collection at the classroom level. The environmental audits were conducted only one time and may not represent the condition of the environment at all, yet the tool has been established as an objective method in the field of transportation research.[15] The additional questions included in the parent survey were not tested for reliability; however, these questions were not included in our final model and are not reflected in the conclusions of this study.

Several strengths of the study are worth noting. This study is unique because it links a rating of the environment with the percent of students walking and bicycling to school. The study demonstrates a correlation between walking and biking and environment features that SRTS can address. It also shows that there are opportunities for improvement.

The information collected is the first data of its kind collected for Louisiana. Response rates were consistent with previously published SRTS research.[11] The study demonstrated the cooperation between the statewide SRTS office, the research team and the sites where the study was conducted. In addition, a scoring method for the environmental audit was developed and can be used for other schools to identify strengths and weaknesses in their pedestrian environment.

Conclusions

The SRTS program is designed to help communities improve the paths that children can walk or bike to school and an opportunity for schools to address these areas of deficit. As paths are made safer for children, use frequently increases, as is seen in previous evaluations of SRTS.[11,12] It is important that community planners, policymakers, public health officials, and school personnel look for possible ways to intervene as children who walk or bike to school are more likely to meet physical activity recommendations than those who are driven.[30] The SRTS program has the potential to influence the infrastructure and promote active transportation to school.

IMPLICATIONS FOR SCHOOL HEALTH

Active transportation to and from school is an ideal opportunity for children to be physically active and establish patterns of transportation into adulthood. Schools can focus on making routes to school safer by focusing on the opportunities identified through PEDS audit and improving the ways students walk to school. Schools can also use these findings to create educational campaigns to help improve parental perception of walking/biking to school, or create school

programs to reduce safety risks associated with active transportation. Schools can utilize this information to make changes to their environment in an attempt to combat childhood obesity and prevent tracking into adulthood.

Human Subjects Approval Statement

All protocols, procedures, and data collection instruments were approved by the Tulane University Institutional Review Board.

REFERENCES

1. Flegal MK, Carroll MD, Ogden CI, Curtin LR. Prevalence and trends in obesity among US adults, 1999-2008. *JAMA*. 2010;303(3):235-241.
2. Ogden C, Carroll MD, Kit BK, Flegal KM. Prevalence of obesity and trends in body mass index among US children and adolescents, 1999-2010. *JAMA*. 2012;307(5):483-490.
3. Singh GK, Kogan MD, van Dyck PC. Changes in state-specific childhood obesity and overweight prevalence in the United States from 2003 to 2007. *Arch Pediatr Adolesc Med*. 2010; 164(7):598-607.
4. US Department of Health and Human Services. Physical activity guidelines for Americans. 2008. Available at: http://www.health.gov/paguidelines/pdf/paguide.pdf. Accessed February 1, 2012.
5. Saelens BH, Handy SL. Built environment correlates of walking: a review. *Med Sci Sports Exerc*. 2008;40(7):S550-S560.
6. American Academy of Pediatrics Policy Statement. The built environment: designing communities to promote physical activity in children. *Pediatrics*. 2009;123(6):1591-1598.
7. Killingsworth R, Lamming J. Development and public health: could our development patterns be affecting our personal health? *Urban Land*. 2001;60:12-17.
8. McDonald NC. Active transportation to school: trends among US schoolchildren, 1969-2001. *Am J Prev Med*. 2007;32(6):509-516.
9. US Department of Transportation, Federal Highway Administration. Safe Routes to School. Available at: http://safety.fhwa.dot.gov/saferoutes/. Accessed February 1, 2012.
10. Chaufan C, Yeh J, Fox P. The Safe Routes to School program in California: an update. *Am J Public Health*. 2012;102(6):e8-e11.
11. Boarnet MG, Anderson CL, Day K, McMillian T, Alfonzo M. Evaluation of the California Safe Routes to School legislation: urban form changes and children's active transportation to school. *Am J Prev Med*. 2005;28(2 suppl 2):134-140.
12. Boarnet MG, Day K, Anderson CL, McMillian T, Alfonzo M. California's Safe Routes to School program: impacts on walking, bicycling, and pedestrian safety. *J Am Plann Assoc*. 2005;71(5):301-317.
13. Government Accountability Office. *Safe Routes to School: Progress in Implementing the Program, but a Comprehensive Plan to Evaluate Program Outcomes Is Needed*. Washington, DC: GAO; 2008 GAO-08-789.
14. McDonald NC, Dwelley AE, Combs TS, Evenson KR, Winters RH. Reliability and validity of the Safe Routes to School parent and student surveys. *Int J Behav Nutr Phys Act*. 2011; 8:56-63.
15. Clifton KJ, Livi Smith AD, Rodriguez D. The development and testing of an audit for the pedestrian environment. *Landscape Urban Plann*. 2007;80:95-110.
16. Saelens BE, Sallis JF, Black JB, Chen D. Neighborhood-based differences in physical activity: an environment scale evaluation. *Am J Public Health*. 2003;93(9):1552-1558.
17. Ferdinand AO, Sen B, Rahurkars S, Engler S, Mehachemi N. The relationship between built environments and physical activity: a systematic review. *Am J Public Health*. 2012;102(10): e7-e13.
18. Henderson S, Tanner R, Klanderman N, Mattera A, Webb LM, Steward J. Safe Routes to School: a public health practice success story—Atlanta, 2008-2010. *J Phys Act Health*. 2013;10(2):141-142.
19. Ahlport KN, Linnan L, Vaugh A, Evenson KR, Ward DS. Barriers to and facilitators of walking and bicycling to school: formative results from the non-motorized travel study. *Health Educ Behav*. 2008;35(2):221-244.
20. Faulker GEJ, Richichi V, Buliung RN, Fusco C, Moola F. What's ''quickest and easiest?'': parental decision making about school trip mode. *Int J Behav Nutr Phys Act*. 2010;7:62.
21. Chriqui JF, Taber DR, Slater SJ, Turner L, Lowrey KM, Chaloupka FJ. The impact of state safe routes to school-related laws on active travel to school policies and practices in the US elementary schools. *Health Place*. 2012;18(1):8-15.
22. Buliung R, Faulkner G, Beesly T, Kennedy J. School travel planning: mobilizing school and community resources to encourage active school transportation. *J Sch Health*. 2011;81(11):704-712.
23. Stauton CE, Hubsmith D, Kallins W. Promoting safe walking and biking to school: the Marin County success story. *Am J Public Health*. 2003;93(9):1431-1434.
24. Sallis J, Owen N. Ecological models. In: Glanz K, Lewis FM, Rimer BK, eds. *Health Behavior and Health Education: Theory, Research and Practice*. 3rd ed. San Francisco, CA: Jossey-Bass; 2002.
25. Salmon J, Salmon L, Crawford DA, Hume C, Timperio A. Associations among individual, social, and environmental barriers and children's walking or cycling to school. *Am J Health Promot*. 2002;22(2):107-113.
26. Panter JR, AP J, van Sluijs EM, Griffin SJ. Attitudes, social support and environmental perceptions as predictors of active commuting behavior in school children. *J Epidemiol Community Health*. 2010;64(1):41-48.
27. Kerr J, Rosenberg D, Sallis JF, Saelens BE, Frank LD, Conway TL. Active commuting to school: associations with environment and parental concerns. *Med Sci Sport Exerc*. 2006;38(4):787-794.
28. Scholossberg M, Greene J, Phillips PP, Johnson B, Parker B. School trips: effects of urban form and distance on travel mode. *J Am Plann Assoc*. 2006;72(3):337-346.
29. Wen LM, Fry D, Rissel C, Dirkis H, Balafas A, Merom D. Factors associated with children being driven to school: implications for walk to school programs. *Health Edu Res*. 2008;23(2):325-334.
30. Davison KK, Werder JL, Lawson CT. Children active commuting to school: current knowledge and future directions. *Prev Chronic Dis*. 2008;5(3):1-11 Available at: www.cdc.gov/pcd/issues/2008/jul/07_0075.htm. Accessed February 4, 2012.