ACTIVE ROUTES TO SCHOOL
A North Carolina Safe Routes to School Project

Active Routes to School Evaluation Update from the UNC Highway Safety Research Center (HSRC)

May 2016

Main Evaluation Goals

- Measure changes in the percentage of K-8 students in North Carolina who walk and bicycle to school in settings where those activities are feasible.
- Measure changes in participating schools' readiness to support safe walking and bicycling.
- Measure changes in participating families' walking and bicycling activity.

Main Data Sources and Collection Schedule

Instrument	Who / how reported	Timing
Student Travel Tallies and Parent Surveys	Coordinators are asked to recruit schools and work with them to collect data	• fall 2014 for baseline • spring 2015 for extended baseline • fall 2015 (first mid-intervention period) through spring 2019 for mid to post intervention
Active Travel Readiness Scale	Coordinators report on the level of readiness to promote walking and bicycling for three to five schools with which they work	Quarterly beginning fall 2014
Active Routes to School Progress Reporting System (Formstack)	Monthly process measures submitted by Coordinators to North Carolina Division of Public Health (NCDPH)	Monthly
Structured interviews	HSRC evaluation team will conduct interviews with exceptional programs to obtain insights into best practices	fall 2016

Findings from fall 2015

Because of the limited sample size from originally scheduled baseline in fall 2014, data collected in spring 2015 became part of an "extended baseline," comprised of the two time periods. Data collected in fall 2015 became the first mid-intervention data. The findings from fall 2015 are summarized in this report.

Schools' Data Collection Activity and Results

Coordinators assisted 99 schools to collect Travel Tallies and 73 schools to collect Parent Surveys between baseline (i.e., fall 2014 and spring 2015) and fall 2015.

Sample Representativeness

On average, adults living in the 57 counties represented in the fall 2015 data collection period were slightly more physically active and more likely to walk or bicycle to work than the average adult in North Carolina. The study's adult population matched North Carolina's adult population in rates of unemployment. Suburban schools were over-represented and city and rural schools were significantly under-represented in the study.

Table 1. Results from 99 Travel Tally-collecting schools derived from negative binomial regression models which clustered responses by school.

Time		# of Trips	Walk	Bike	Bus	Car	Other
Baseline	Morning	52,256	1.4%	0.2%	42.1%	56.2%	0.1%
	Afternoon	50,016	2.7%	0.3%	55.1%	41.1%	0.8%
Fall 2015	Morning	51,360	3.1%	0.1%	41.2%	55.0%	0.6%
	Afternoon	49,819	3.3%	0.2%	53.7%	41.6%	1.3%

When looking at the 99 schools that collected Travel Tallies that allowed for comparison between baseline and fall 2015, students were twice as likely to walk to school in fall 2015 as they were at baseline. Older students (i.e., 6^{th} – 8^{th} grade) attending city schools were most likely to walk or bicycle to and from school. Older students attending suburban or town-based schools were more likely than similarly situated younger students to be driven or ride a bus between home and school. Students attending lower income schools were less likely to be driven to or from school than were students attending higher income schools.

Table 2. Results from 33 schools that collected Travel Tally information on two occasions.

Time		# of Trips	Walk	Bike	Bus	Car	Other
Baseline	Morning	17,420	1.3%	0.0%	49.2%	49.2%	0.4%
	Afternoon	16,981	2.7%	0.1%	53.8%	42.9%	0.6%
Fall 2015	Morning	17,259	1.7%	0.1%	48.9%	48.9%	0.4%
	Afternoon	16,872	3.6%	0.1%	51.7%	43.5%	1.1%

Within the sample of 99 schools, 33 collected information both during baseline and in fall 2015. When looking at this group, walking and bicycling to and from school remained stable, approaching a statistically significant increase in the afternoon in fall 2015 ($p = 0.112$). In terms of how students traveled between home and school, there were no significant differences between schools that collected Travel Tallies once (n = 99 schools) and those that collected them twice (n = 33).

Table 3. Results from 73 Parent Survey-collecting schools derived from mixed-effects logistic regression results, which captured school-level random effects.

Time		# of Surveys	Walk/Bike	Bus/Transit	Car	Other
Baseline	Morning	6,399	3.5%	37.2%	56.8%	0.1%
	Afternoon	6,208	3.9%	47.7%	43.6%	0.7%
Fall 2015	Morning	3,140	3.0%	41.6%	55.4%	0.2%
	Afternoon	3,084	4.9%	53.9%	41.5%	0.8%

Examining results from the 73 schools that allowed for comparison between baseline and fall 2015, there was no statistically significant shift in the travel mode students used to get to and from school (*p* values ranging from 0.287 for riding a bus home from school to 0.805 for being driven home from school).

While the exact reasons why the Parent Survey results differ from the Travel Tally results are not known, three potential reasons could likely explain the differences: (1) in most cases, different schools collected either Travel Tallies or Parent Surveys, only a handful of schools collected both; (2) Parent Surveys capture how children travel between home and school "on most days", whereas Travel Tallies capture how children get to and from school during two or three days in a given week; and (3) Parent Surveys solicit information on children's estimated distances from school, as well as parents' perceptions of walking and bicycling to school, which is information the Travel Tallies do not solicit.

Predictors of travel mode choice between home and school from 73 Parent Survey-collecting schools.

- **Walk/Bike:** After distance from school, parents' perceptions of how much fun walking and biking to school is for their child and children asking parents to walk or bike to school were strongly associated with walking or bicycling to school.
- **Bus:** Children asking permission to walk or bike to school was negatively associated with their riding a bus to and from school. Those who rode a bus between home and school were most commonly older students who lived far from school.
- **Car:** Parent-perceived fun of walking and biking to school negatively predicted being driven in a car to and from school. Those who rode in a car between home and school were most commonly younger students who lived far from school.

Predictors of parents' and students' walking or biking activity from 73 Parent Survey-collecting schools.

- **Parent walked/biked to school with child:** Parent-perceived fun of walking and biking to school for their child was strongly associated with parents' accompanying their child on the walk or bike ride to school.
- **Child walked/biked after school or on the weekend:** Parent-perceived fun of walking and biking to school was strongly associated with students' walking and biking activity after school and on the weekend. Schools' encouragement of walking and biking to school—while it did not predict walking to and from school—did predict students' walking and biking after school and on the weekend, especially at rural schools.
- **Parent walked/biked:** Parent-perceived fun of walking and biking to school was associated with parents' general walking and biking activity. Parents with students enrolled in higher income schools that encouraged walking and biking to school walked and biked the most.

Table 4. Results from 20 schools where it's theoretically feasible* to walk or bike between home and school.

Schools in which more than 12.5% of students (i.e., the median value) lived within ½ mile of school and whose parents completed Parent Surveys on more than one occasion are included in the following analysis.

Time		# of Surveys	Walk/Bike	Bus/Transit	Car	Other
Baseline	Morning	1,609	4.4%	33.0%	57.7%	1.9%
	Afternoon	1,589	6.0%	50.1%	39.4%	1.9%
Fall 2015	Morning	930	5.3%	31.0%	60.8%	0.5%
	Afternoon	921	7.8%	41.6%	48.0%	1.5%

From baseline through fall 2015 school travel mode choices did not shift significantly. The one exception was the proportion of students driven home from school, which increased significantly from Baseline to fall 2015 (p = 0.042).

Differences between all 73 Parent Survey-collecting schools and the subset of 20 Parent Survey-collecting schools where it's theoretically feasible to walk or bike to school included the following:

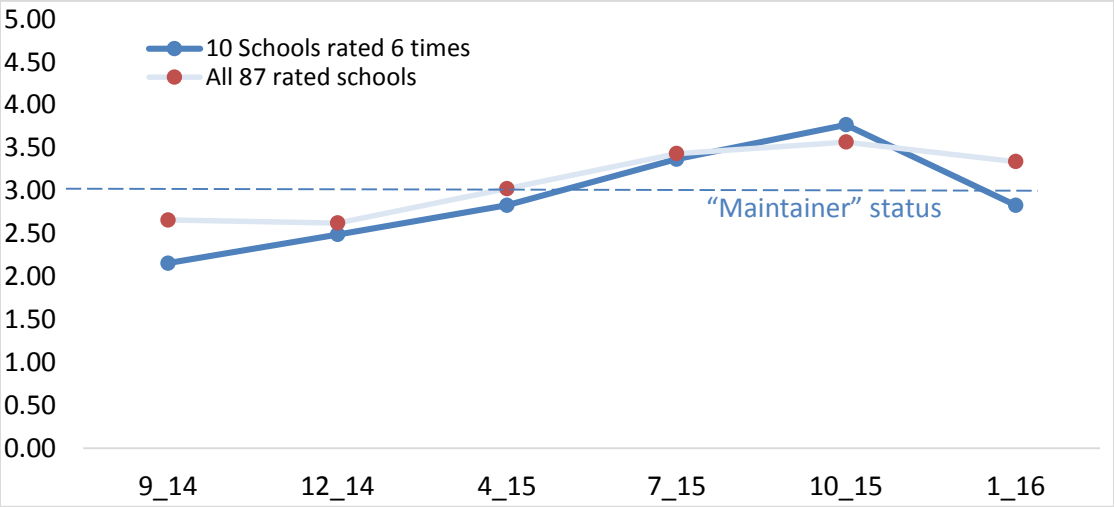
- **The importance of parent-perceived health:** Along with parent-perceived fun of walking and biking to school, perceived health of walking and bicycling predicted children's walking and bicycling to and from school. Such perceived health benefits also predicted riding a bus between home and school.
- **The Project's potential impact on children's walking and biking activity outside of school:** Among children who attended schools likely more facilitative of walking or biking to school, more of them walked or biked after school and on the weekend in fall 2015 than did at baseline.
- **The impact of children's walking and biking to school on their parents' walking and biking activity levels:** When children walked and biked between home and school, their parents' walked and biked significantly more than parents whose children did not walk or bike to school, regardless of whether the parent was accompanying their child on the trip to school.

Active Travel Readiness Ratings

The Active Travel Readiness Scale is a measure of Active Routes to School Coordinators' perception of schools' interest in and engagement with walking and bicycling to and at school. Each quarter, Coordinators assign a score of 0 ("No Interest, No Activity") to 5 ("Lots of interest, Many activities, Seeking more to do") for three to five schools with which they work intensely (for more information on the scale, see the Appendix).

Regression models controlling for schools' locale and school-level income reveal that between September 2014 and January 2016, Coordinators' ratings of schools' Active Travel Readiness increased significantly, though they dipped in January 2016 (Figure 1).

Figure 1. Estimated Active Travel Readiness ratings over time.



- **Among the 10 schools that Coordinators rated all six months:** These schools' Active Travel Readiness ratings increased like the larger group's ratings, but experienced a larger dip in January 2016. It is unclear why these frequently rated schools "regressed" in January 2016 (Figure 1). Perhaps some of the 10 frequently rated schools lost a "school champion" during the period, which served to temper the schools' momentum. Or maybe the colder weather during the three months leading up to January—i.e., the period of time Coordinators were asked to consider schools' active travel readiness when they rated schools in January—contributed to the schools being less enthusiastic about promoting walking and biking to school. And as a result, the Coordinators may have had higher expectations of these schools based on the schools' performance during warmer time periods of activity. This is a topic worthy of further investigation. HSRC will assess whether and to what extent Active Travel Readiness scores predict walking and bicycling outcomes in future analyses.

Discussion and Implications for Active Routes to School Regional Coordinators' Work

Though early in this evaluation, it appears that by engaging "feasibly walkable or bike-able schools" with educational experiences, promotional events, and positive messaging, the Coordinators and their partners may be inspiring students to walk and bike more after school and on weekends. Future analyses will help the team better understand this relationship, but these early results are promising. The following discussion highlights relationships among school-, household-and student-level variables, their influence on walking and bicycling between home and school and beyond, and implications for the Active Routes to School Regional Coordinators' work.

The "fun factor." Parents' perceptions of the level of fun walking or biking to school was for their children was the strongest predictor—after distance from school—of whether children walked or biked. These students were also less likely to be driven to and from school. Not only that, perceived fun was the strongest predictor of whether and how much parents walked or biked to school with their children, how much children walked or biked after school and on the weekend, and how much parents walked or biked in general. ***Practical implications:*** *Support walking- and bicycling-focused events that highlight the fun of walking and bicycling between home and school. Capturing photos and videos of smiling families and school staff can communicate the community-oriented benefits of active school travel to school*

administrators and other decision-makers. While fun might sound too "soft" for a serious strategy, it seems to hold promise for supporting impactful change.

Parents' walking and bicycling activity over time. Baseline results indicate that accompanying children on the walk or bicycle ride to school contributed about five percent of the total amount of walking and bicycling parents did in a given week. However, in fall 2015, about 20 percent of parents' walking and bicycling activity was accounted for by accompanying their child on the walk or bike ride to school. And the more the students walked and biked to school, the more their parents walked and bicycled in general, not just the trip to school (p = 0.001). It could be that children's and parents' walking and bicycling activity influenced one another by: (1) parents getting involved in SRTS programming; or (2) parents and children broadening their perspective on walking and bicycling as viable means of transport. It's also possible that parents who enjoy walking and bicycling are more likely to participate in these activities with their children, and that some communities—including the communities' infrastructure—simply support walking and biking more than others. Future analysis will seek to better understand the direction of this relationship. ***Practical implications:*** *Encourage parents to get involved in SRTS programming. Recruit them to lead walking school buses from homes or remote drop-off locations; invite walking and bicycling parents to socialize with other parents and school staff during drop-off and pick-up transition times, thereby creating a sense of community while encouraging parents to remain engaged in walking or bicycling to school; invite parents as special guests to participate in on-campus walking programs; and improve infrastructure so more adults and children have the opportunity to walk and bike separated from traffic.*

Asking parents' permission to walk or bicycle to school. Students who asked to walk or bicycle to school were more likely to do so. Also, asking permission to walk or bike was negatively associated with riding a bus between home and school. Curiously, in places where it was likely more feasible to walk and bicycle to school, asking permission to actively travel to school was predictive of being driven to school, yet not predictive of riding a bus to school. This could be because some parents wish to accompany their children on the trip to school, something not possible when children ride a school bus. It could also be that children who asked permission to walk or bike did not want to ride a bus to school, so instead accepted a ride from their parents. ***Practical implications:*** *Schools can encourage students to discuss transportation options with their families. This could be accomplished through homework assignments or service learning projects.*

Schools' encouragement of walking and bicycling to and from school. Overall, parents' perceptions of schools' encouragement of walking and biking to school was weakly associated with active school travel among all 73 Parent Survey-collecting schools. However, schools' perceived encouragement of active school travel modes strongly predicted students walking and bicycling activity after school and on the weekend, as well as parents' walking and bicycling activity. This strong association did not hold among the 20 schools where it was theoretically feasible to walk or bike between home and school. In these places, walking and bicycling outside of the school trip appeared to be more influenced by location—i.e., suburban locales with higher socio-economic status, areas which may maintain more supportive walking and biking infrastructure than lower income areas. ***Practical implications:*** *Consider using prominent banners that promote safe walking and bicycling to school and elsewhere; placing bike racks in visible locations at school and around town; developing school policies that include safe walking and bicycling as an objective; and using consistent school-parent communications that feature walking and bicycling*

as viable transportation options. These strategies can create a welcoming community climate for safe walking and bicycling.

Appendix

School archetypes using the Active Travel Readiness scale

Coordinators are prompted with: "This school community…"

...is not interested in promoting safe walking/biking and hasn't conducted any activities.	…shows some interest in promoting safe walking/biking, but hasn't gotten involved yet.	…shows some interest in promoting safe walking/biking, and has done a few activities to promote them.	…shows a lot of interest in promoting safe walking/biking and has consistently done one or two activities each year.	…shows a lot of interest in promoting safe walking/biking and has consistently done several activities each year.	…shows a lot of interest in promoting safe walking/biking, has consistently done numerous activities, and wants to do more to make walking/biking to (or at) school an important part of the school's culture.
Keywords for classifying a school					
No interest No activity	Some interest No activity	Some interest A little activity	Lots of interest A few activities	Lots of interest Many activities	Lots of interest Many activities Seeking more to do
Archetype					
Resistor	Beginner-1	Beginner-2	Maintainer-1	Maintainer-2	Maintainer-3
Active Travel Readiness score					

0	1	2	3	4	5