The Impact of the Built Environment and Safe Routes to School-Related Policies on Youth Active Travel in a National Sample of Public Elementary Schools

Society for Behavioral Medicine, New Orleans, LA

April 12, 2012

Sandy Slater, PhD
Assistant Professor, University of Illinois at Chicago, School of Public Health

Acknowledgments

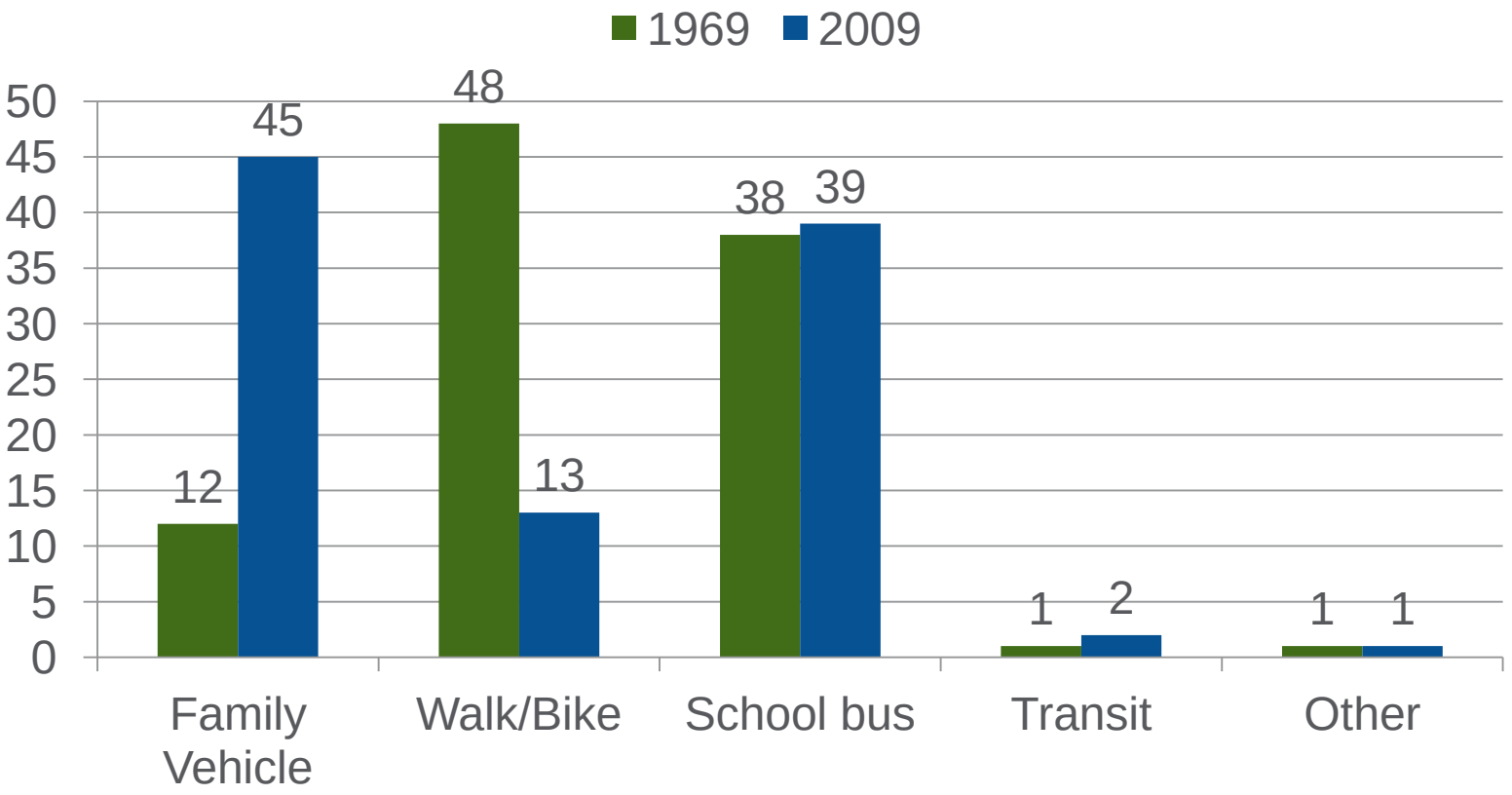
Co-Authors:

- Lisa Nicholson, PhD
- Jamie Chriqui, PhD
- Haytham Zayd
- Lindsey Turner, PhD
- Frank Chaloupka, PhD

The Research presented is funded by grants from RWJF and NICHD

Background and Significance

Comparison of the Usual Travel Mode To School for K-8th Grade Students, 1969 and 2009



National Center for Safe Routes to School, 2011

Background and Significance

- Greater distances to school account for 50 percent of the decline in active travel to school.
- In 2009 31 percent of K-8th grade students lived within one mile of school.
- In 1969, 89 percent of K-8th grade students who lived within one mile of school usually walked or bicycled to school. By 2009, only 35 percent of K-8th grade students who lived within a mile of school usually walked or bicycled to school even once a week.
- Recent research shows that schools in states with SRTS laws can increase the number of students who walk/bike to school.

(McDonald 2007; NCSRTS, 2011; Chriqui et al. 2012)

After a Systematic Review of the Scientific Literature, the Task Force on Community Preventive Services Recommends the Following Environmental and Policy Approaches to Increase Physical Activity

Environmental Policy Approach	Strategies
Enhanced School-based Physical Education	Increase # of minutes spent in MVPA
Community-Scale and Urban Design Land Use Policies	Mixed use, street connectivity, aesthetics and safety
Street-Scale Urban Design Land Use Policies	Roadway design standards, traffic calming, safe street crossings, street lighting

Impact of the built environment and Safe Routes to School-Related policies on youth active travel in a national sample of public elementary schools- Preliminary Results

The Food and Fitness Survey Data

•The Food and Fitness Project was launched in 2007 to assess obesity-relevant policies and practices among US elementary schools and their corresponding schools districts.

•Data were obtained from annual mail-back surveys of school administrators at nationally representative samples of public elementary schools for the 2007-08 through 2009-10 school years.

•Stacked cross-sectional analysis of 1,020 public elementary schools, nested within 47 states.

•State laws were obtained through primary legal research.

•All models controlled for SRTS-related state laws; principal-reported barriers to walking/biking to school; region, locale; school racial composition; % of students receiving free-reduced lunch; and, total number of students attending school.

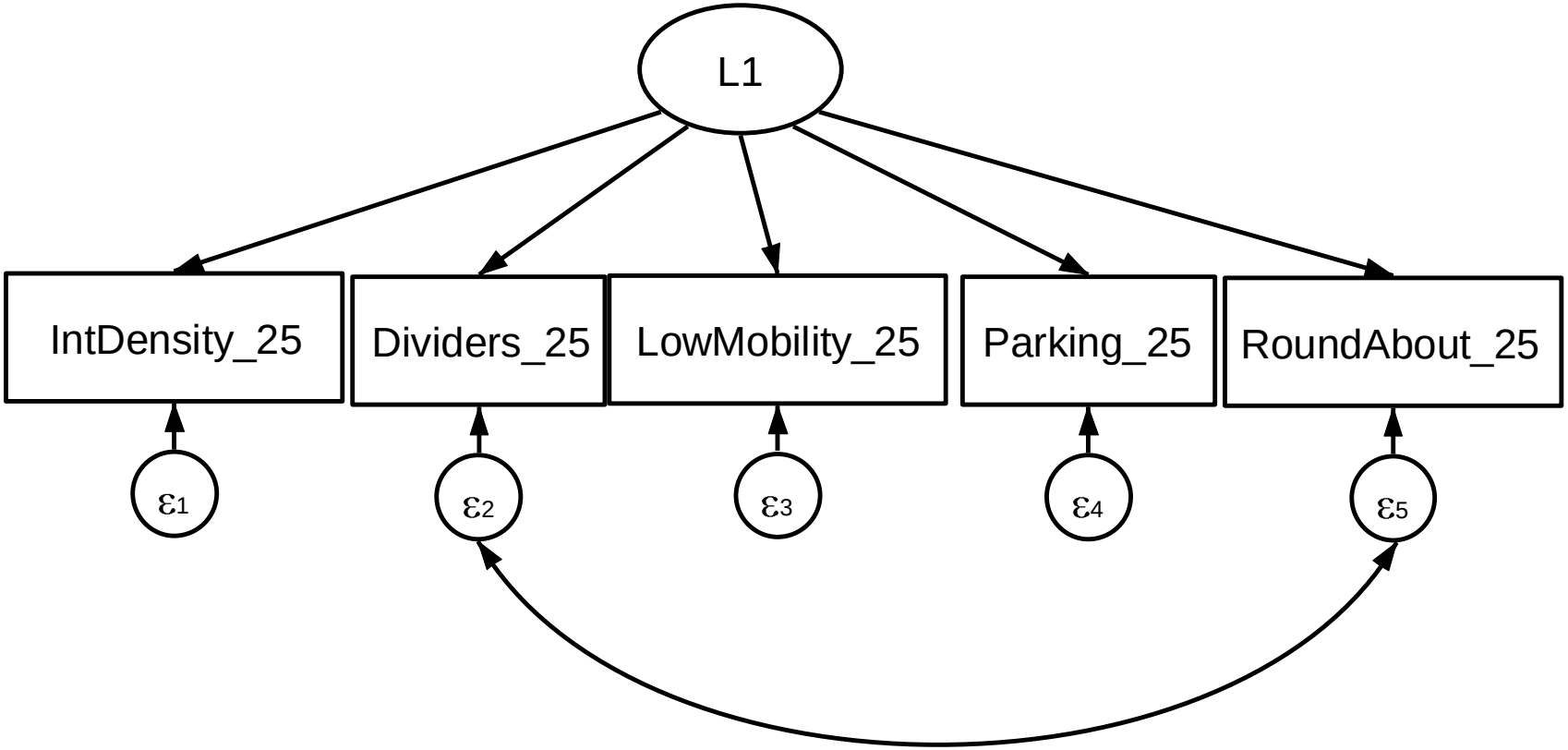
The Food and Fitness Survey Data

- 17.6 percent of students in the sample walk/bike to school, 84% of schools allow students to walk/bike.
- 54% of schools in sample allow all students to bike to school
- 77% allow all students to walk to school
- 31% of principals reported lack of sidewalks as a barrier to walking/biking
- 56% of principals reported traffic danger as a barrier to walking/biking
- 44% of principals reported distance as a barrier to walking/biking
- 20% of principals reported lack of crossing guards as a barrier to walking/biking
- On average buffers had an intersection density of 372/sq. mi.
- On average 55% of the streets in our buffers had higher road classifications (i.e. speed limits)

The Food and Fitness Survey Data

- 49% of states have a Minimum Bussing Distance law.
- 22.2% require Sidewalks to be maintained or constructed around schools.
- 9.8% require crossing guards
- 38.6% require traffic control measures (e.g. speed humps, traffic calming devices)
- 81% require speed zones around schools.

Traffic Calming Scale: Latent Variable Construction



Associations between traffic calming scale and components on Walking/Biking to School across buffers
Significance of Poisson Models (RR) (N=1686)

	¼ Mile	½ Mile	¾ Mile	1 Mile
Traffic Calming Scale	***	***	***	***
Scale Items:				
Intersection Density	***	***	***	***
Parking	*	*	*	**
Dividers	**	**	**	***
Low Mobility	***	***	***	***
Roundabouts	ns	ns	ns	ns

* p<.10, **p<.05, ***p<.01, ns=not significant

Associations between traffic calming scale and components on Walking/Biking to School across buffers
Significance of Inflate Models (OR) (N=1686)

	¼ Mile	½ Mile	¾ Mile	1 Mile
Traffic Calming Scale	ns	ns	ns	ns
Scale Items:				
Intersection Density	**	ns	ns	ns
Parking	***	***	***	***
Dividers	**	ns	*	ns
Low Mobility	ns	ns	ns	ns
Roundabouts	**	ns	ns	ns

* p<.10, **p<.05, ***p<.01, ns=not significant

Impact of built environment on Youth Active Travel – Preliminary Results

Results of Poisson Models (OR) (N=1686)

	¼ Mile	½ Mile	¾ Mile	1 Mile
Traffic Calming Scale	0.988 (0.753, 1.297)	0.847 (0.598, 1.200)	1.037 (0.782, 1.376)	1.038 (0.889, 1.212)
Traffic Danger	1.11 (0.898, 1.371)	0.891 (0.639, 1.244)	0.906 (0.645, 1.272)	0.909 (0.701, 1.180)
Mean Speed Limit	0.946 (0.858, 1.043)	1.017 (0.876, 1.181)	1.002 (0.877, 1.145)	0.967 (0.834, 1.120)
Minimum Busing Distance	**0.652 (0.490, 0.867)**	**0.656 (0.493, 0.872)**	**0.656 (0.492, 0.875)**	**0.648 (0.482, 0.870)**
Sidewalk Construction	**0.451 (0.228, 0.892)**	**0.453 (0.239, 0.857)**	**0.428 (0.229, 0.801)**	**0.397 (0.211, 0.747)**
Crossing Guards	**0.356 (0.177, 0.713)**	**0.371 (0.180, 0.764)**	**0.383 (0.189, 0.778)**	**0.332 (0.167, 0.658)**
Traffic Control Measures	1.298 (0.665, 2.536)	1.326 (0.692, 2.541)	1.285 (0.664, 2.489)	1.325 (0.689, 2.550)
Required Speed Zones	0.753 (0.411, 1.379)	0.723 (0.403, 1.295)	0.703 (0.390, 1.266)	0.704 (0.397, 1.248)

Slater et al. 2012 in development

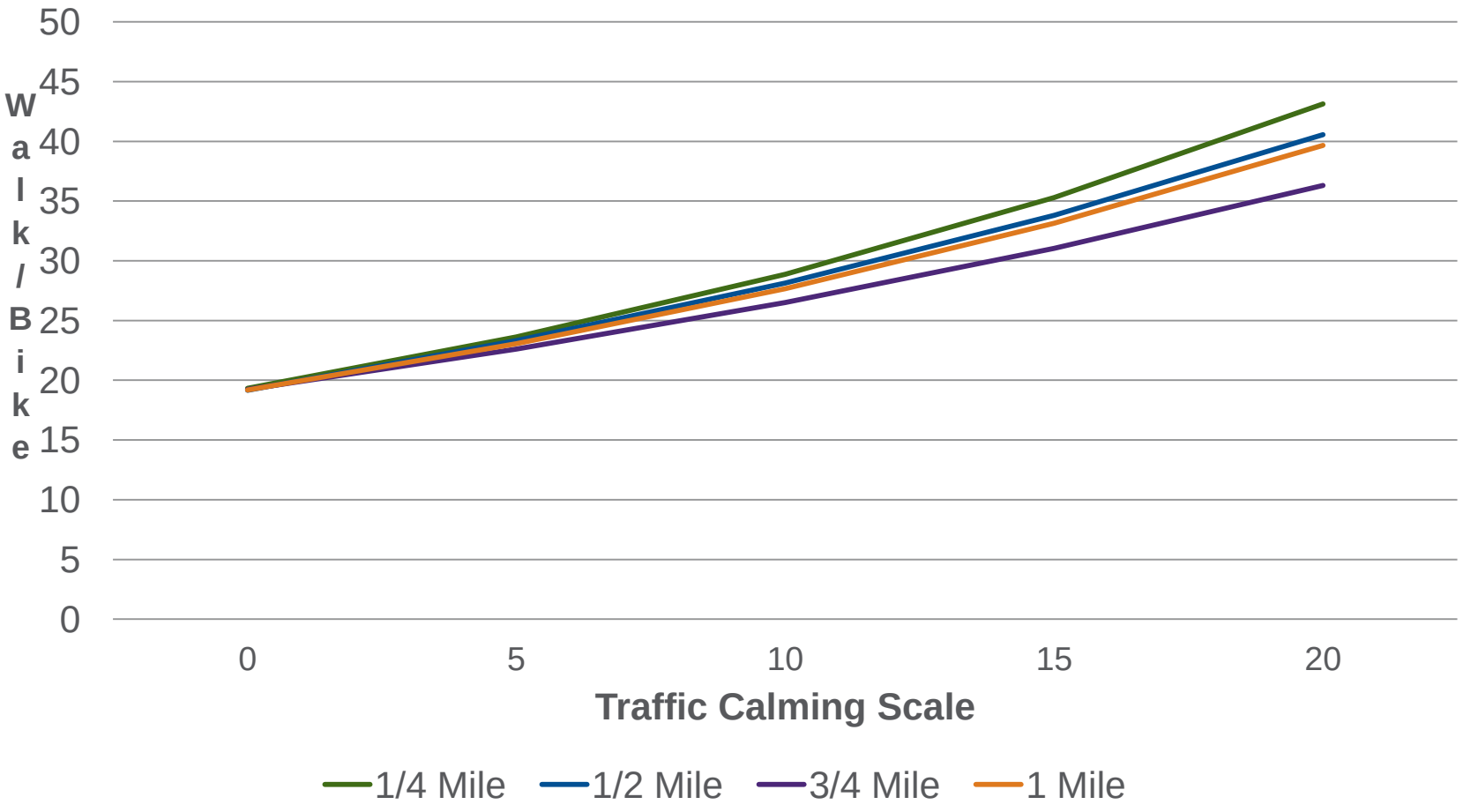
Impact of built environment on Youth Active Travel – Preliminary Results

Results of Poisson Models (RR) (N=1686)

	¼ Mile	½ Mile	¾ Mile	1 Mile
Traffic Calming Scale	**1.041 (1.022, 1.059)**	**1.037 (1.022, 1.052)**	**1.034 (1.017, 1.051)**	**1.039 (1.021, 1.056)**
Traffic Danger	1.032 (0.976, 1.091)	1.011 (0.999, 1.024)	**0.980 (0.968, 0.993)**	1.005 (0.996, 1.013)
Mean Speed Limit	**0.979 (0.965, 0.993)**	0.986 (0.972, 1.000)	1 (0.984, 1.016)	0.99 (0.963, 1.017)
Minimum Busing Distance	1.058 (0.991, 1.124)	1.053 (0.988, 1.122)	1.049 (0.989, 1.113)	1.053 (0.993, 1.116)
Sidewalk Construction	**1.163 (1.014, 1.335)**	1.147 (0.998, 1.319)	1.134 (0.979, 1.313)	1.140 (0.988, 1.315)
Crossing Guards	1.168 (0.969, 1.408)	1.122 (0.932, 1.350)	1.123 (0.936, 1.346)	1.129 (0.943, 1.351)
Traffic Control Measures	0.925 (0.789, 1.084)	0.913 (0.777, 1.073)	0.919 (0.782, 1.081)	0.91 (0.776, 1.069)
Required Speed Zones	0.945 (.0789, 1.132)	0.974 (0.808, 1.174)	0.967 (0.803, 1.166)	0.941 (0.786, 1.128)

Slater et al. 2012 in development

Predicted probability % walk/bike to school across traffic calming scale range & buffers



Conclusions

- We found that among schools where students walk/bike a greater presence of traffic calming infrastructure near schools increased the odds of students walking/biking to school.
- These findings can help inform federal, state and local policy, such as:
  - **Local**: community development plans (Zoning and Subdivision ordinances) and school siting plans.
  - **State**: State-level SRTS laws
  - **Federal**: funding for SRTS – one of the largest programs that fund biking and walking infrastructure.
- Changes in the built environment require long-term planning, but they can also have lasting health effects and provide one possible solution to help combat the obesity epidemic.