

Context-Specific Correlates of Walking to School: Do They Vary across Neighborhoods & Populations?

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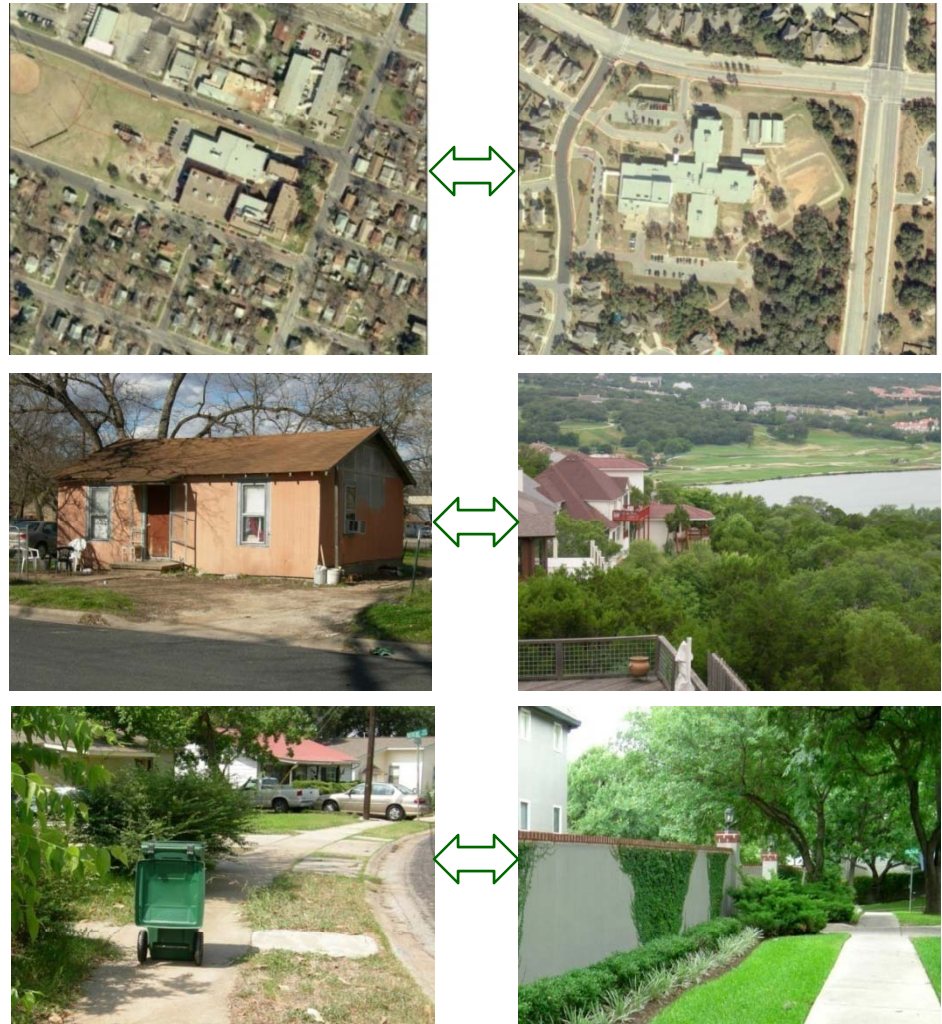
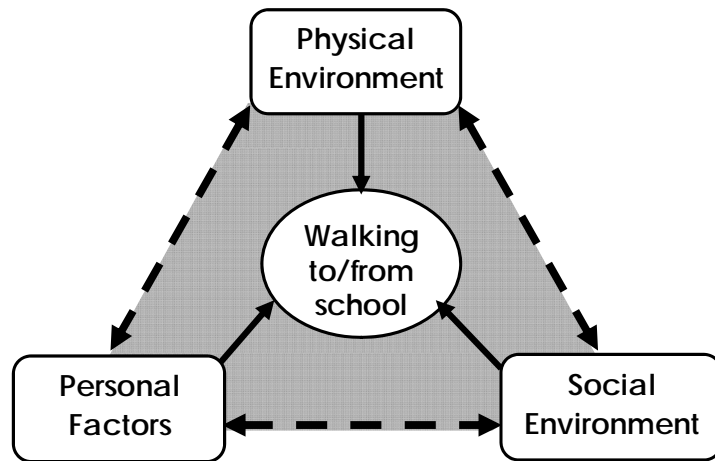
Findings

Conclusion



I. Background: Gaps of Knowledge

- ❖ Possible differences in correlates of walking to school across different **contexts**



❖ Study Population & Measures

- **Either** large-sample studies relying on surveys
or small-sample study relying on focus groups & interviews

❖ Environmental Measures

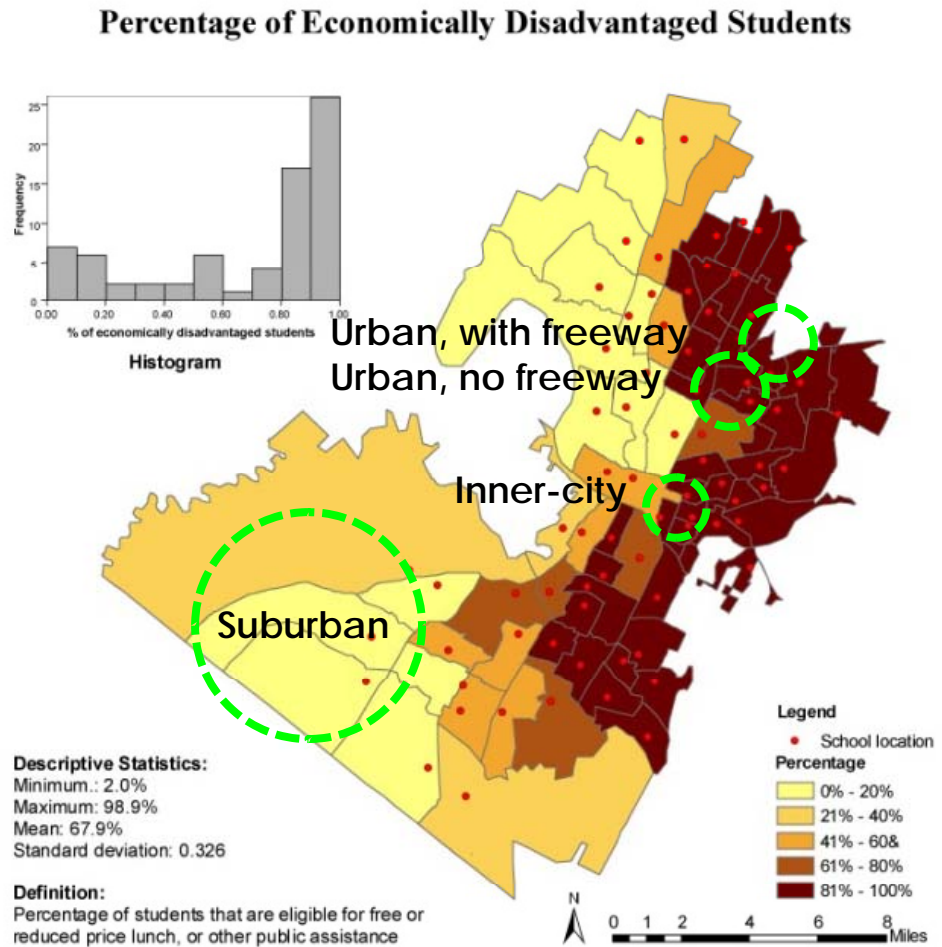
- **Either** subjective (e.g., survey)
or objective (e.g., GIS/field audit)

Limitations in:

- Understanding of **context-specific correlates**
- Development of **tailored interventions** with optimized effects

II. Question

- ❖ Do different *neighborhoods & populations* have different barriers & motivators for walking to school?
- ❖ Do different *measurement methods* supplement or contradict with each other?



III. Method

❖ 4 Types of Contexts

Inner-city



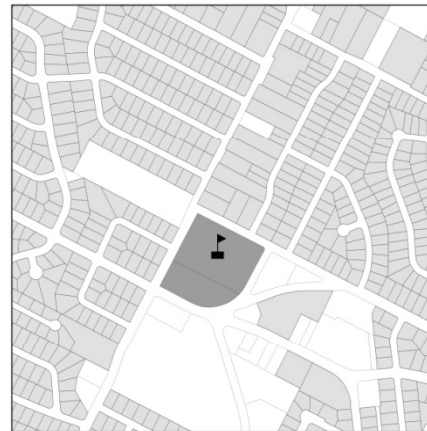
Urban;
with freeway in
attendance area





Urban;
no freeway in
attendance area



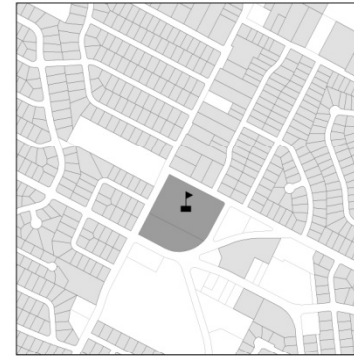
Suburban



 Residential Landuse
 School Parcel

0 0.25 0.5 1 Miles 

School



Context

Inner city

Urban; with freeway

Urban; no freeway

Suburban

Street network	Grid-like; high connectivity (0.42 inter./acre)	Mixed; medium connectivity (0.14 inter./acre)	Mixed; medium connectivity (0.22 inter./acre)	Cul-de-sac; low connectivity (0.07 inter./acre)
Size of single-family parcel	Small (mean=5,198 ft ²)	Medium (mean=12,150 ft ²)	Medium (mean=9,293 ft ²)	Large (mean=24,547 ft ²)
Distance	73% within ½ mile	27% within ½ mile	40% within ½ mile	21% within ½ mile
Sidewalk %	40%	34%	24%	8%
Density	9 persons/acre	11 persons/acre	12 persons/acre	2 persons/acre
Land use mix^b	0.7	0.5	0.6	0.1
Crime rate	96 offenses/yr /100 acres	50 offenses/yr /100 acres	108 offenses/yr /100 acres	5.1 offenses/yr /100 acres
Crash rate	7 crashes/yr/street mile	4 crashes/yr/street mile	3 crashes/yr/street mile	1 crash/yr/street mile
Ethnicity	Mostly Hispanic (89%)	Mixed (66% Hispanic)	Mixed (79% Hispanic)	Mostly white (75%)
SES	94% free or reduced-price lunch	93% free or reduced-price lunch	98% free or reduced-price lunch	8% free or reduced-price lunch

^a S.D.: Standard deviation; ^b With a 0-1 range; larger values indicate greater land use mix

❖ Data Collection & Analysis

- ❑ Personal, social & *perceived* physical environmental factors
- ❑ Logistic regression

SAFE ROUTES TO SCHOOL SURVEY

Directions: This survey is to be answered by the parent/guardian who is most involved in getting the child to and from school. Please be assured that everything you tell us will be kept strictly confidential.

The first few questions are about how your child normally gets to and from school. Please answer the questions in **bold** (boldface) by checking the box that applies.

Please begin by school		Please indicate by home	
1. On a normal day, how does your child travel?	<input type="checkbox"/> Walk alone <input type="checkbox"/> Walk with friends <input type="checkbox"/> Walk with a parent/caretaker <input type="checkbox"/> Bike <input type="checkbox"/> School bus <input type="checkbox"/> Private cars, including carpool	<input type="checkbox"/> Walk alone <input type="checkbox"/> Walk with friends <input type="checkbox"/> Walk with a parent/caretaker <input type="checkbox"/> Bike <input type="checkbox"/> School bus <input type="checkbox"/> Public bus <input type="checkbox"/> Private cars, including carpool	<input type="checkbox"/> Walk alone <input type="checkbox"/> Walk with friends <input type="checkbox"/> Walk with a parent/caretaker <input type="checkbox"/> Bike <input type="checkbox"/> School bus <input type="checkbox"/> Public bus <input type="checkbox"/> Private cars, including carpool
2. How long does it take to travel?	<input type="checkbox"/> Less than 15 minutes <input type="checkbox"/> 15-30 minutes <input type="checkbox"/> More than 30 minutes	<input type="checkbox"/> Less than 15 minutes <input type="checkbox"/> 15-30 minutes <input type="checkbox"/> More than 30 minutes	<input type="checkbox"/> Less than 15 minutes <input type="checkbox"/> 15-30 minutes <input type="checkbox"/> More than 30 minutes
3. Is this distance close enough for your child to walk to school?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
4. Does the school provide bus service for your child?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No

Now we would like to ask you some questions about your child's way to and from school.

5. Which of the following are located along your child's way to school? (Check all that apply.)

<input type="checkbox"/> Playground	<input type="checkbox"/> Park	<input type="checkbox"/> Walking path or trail	<input type="checkbox"/> Convenience store
<input type="checkbox"/> Bakery/confectionery	<input type="checkbox"/> Dry ice store	<input type="checkbox"/> Bus stop	<input type="checkbox"/> Community/faith center
<input type="checkbox"/> Library	<input type="checkbox"/> Child building	<input type="checkbox"/> Residential site	<input type="checkbox"/> Retail lot
<input type="checkbox"/> Large parking lot	<input type="checkbox"/> Other...		

6. Which of the following would your child have to cross while walking to school? (Check all that apply.)

<input type="checkbox"/> A highway or freeway	<input type="checkbox"/> A road with busy traffic	<input type="checkbox"/> An intersection without street signs or stop signs	<input type="checkbox"/> An intersection without a painted crosswalk	<input type="checkbox"/> None of the above
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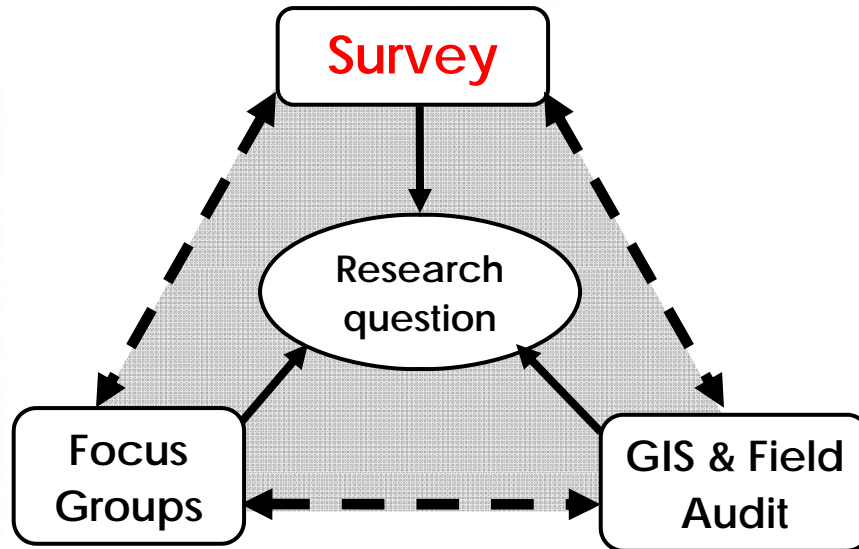
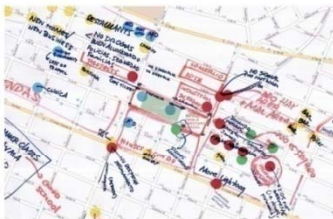
7. Are there sidewalks along your child's way to school?

<input type="checkbox"/> Yes, on all streets	<input type="checkbox"/> Yes, on most streets	<input type="checkbox"/> Yes, on some streets	<input type="checkbox"/> Yes, on very few streets	<input type="checkbox"/> No (if you choose this, please skip the next question, and go directly to question 8.)
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8. What do you think about the sidewalks along your child's way to and from school? Please tell us how much you agree or disagree with each statement by circling your answer.

Statement	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1) Sidewalks are well-maintained and clean.	1	2	3	4	5
2) Sidewalks are wide enough for two persons walking together.	1	2	3	4	5
3) Sidewalks are separated from traffic by grass or trees.	1	2	3	4	5
4) Some sidewalks are blocked by trash cans, street poles, or cars.	1	2	3	4	5

- ❑ Open-ended
- ❑ Content analysis



- ❑ *Objective* physical environment
- ❑ Exploratory



IV. Findings

1. Survey Results

❖ Mean Comparison across Schools

❑ Suburban School: *Greatest* Difference from Other Schools

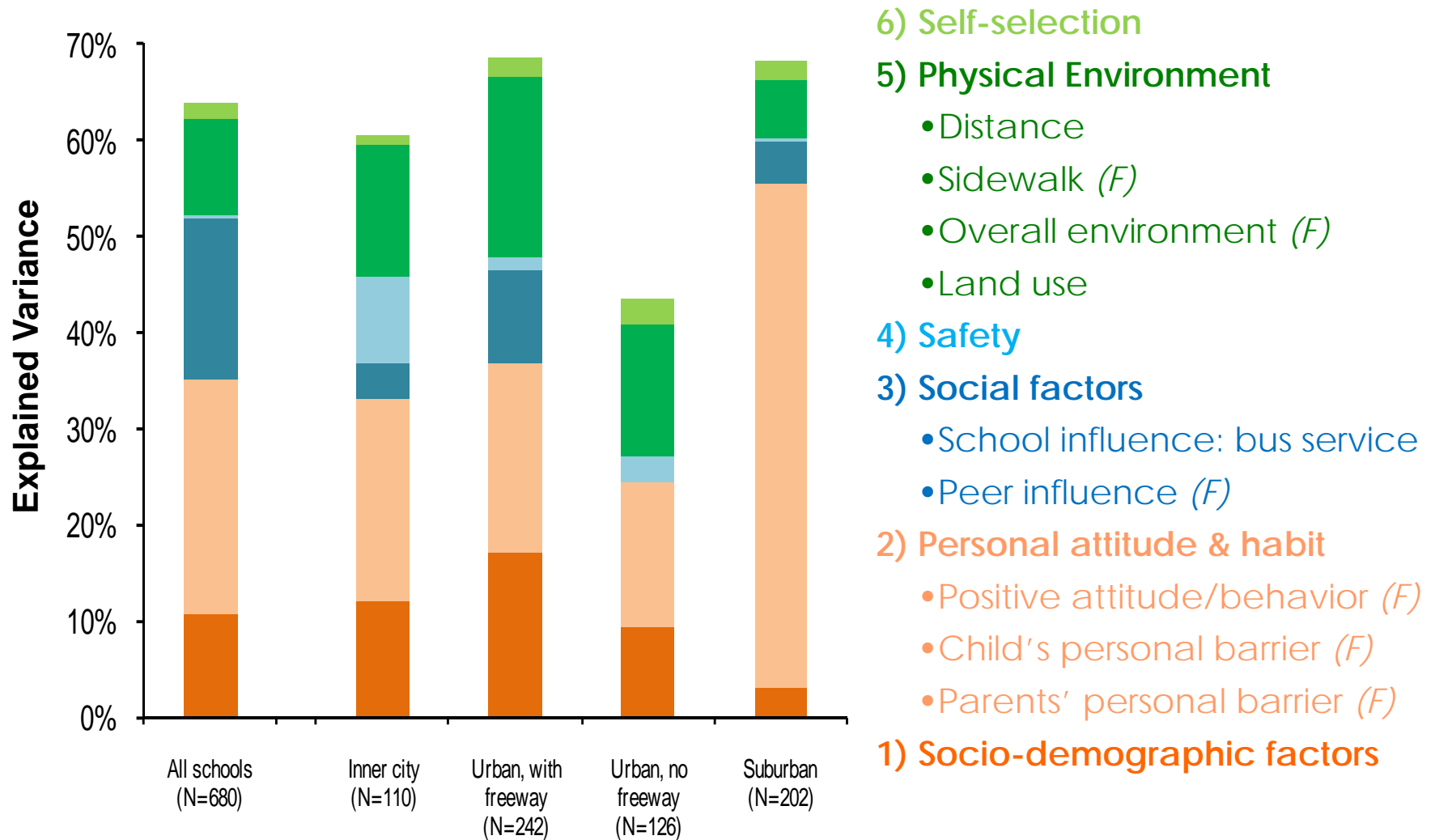
- **Personal:** Generally more positive attitude
- **Social:** Higher safety
- **Physical Environmental:** Greater walkability
- **Health:** Lower BMI

❑ Urban school with freeway:

- More concerns about child getting lost or hit by a car
- More barrier about “too much planning ahead” & less enjoyment from walking with child to school

❖ Data Reduction

❖ Explained Variance by Blocks of Variables

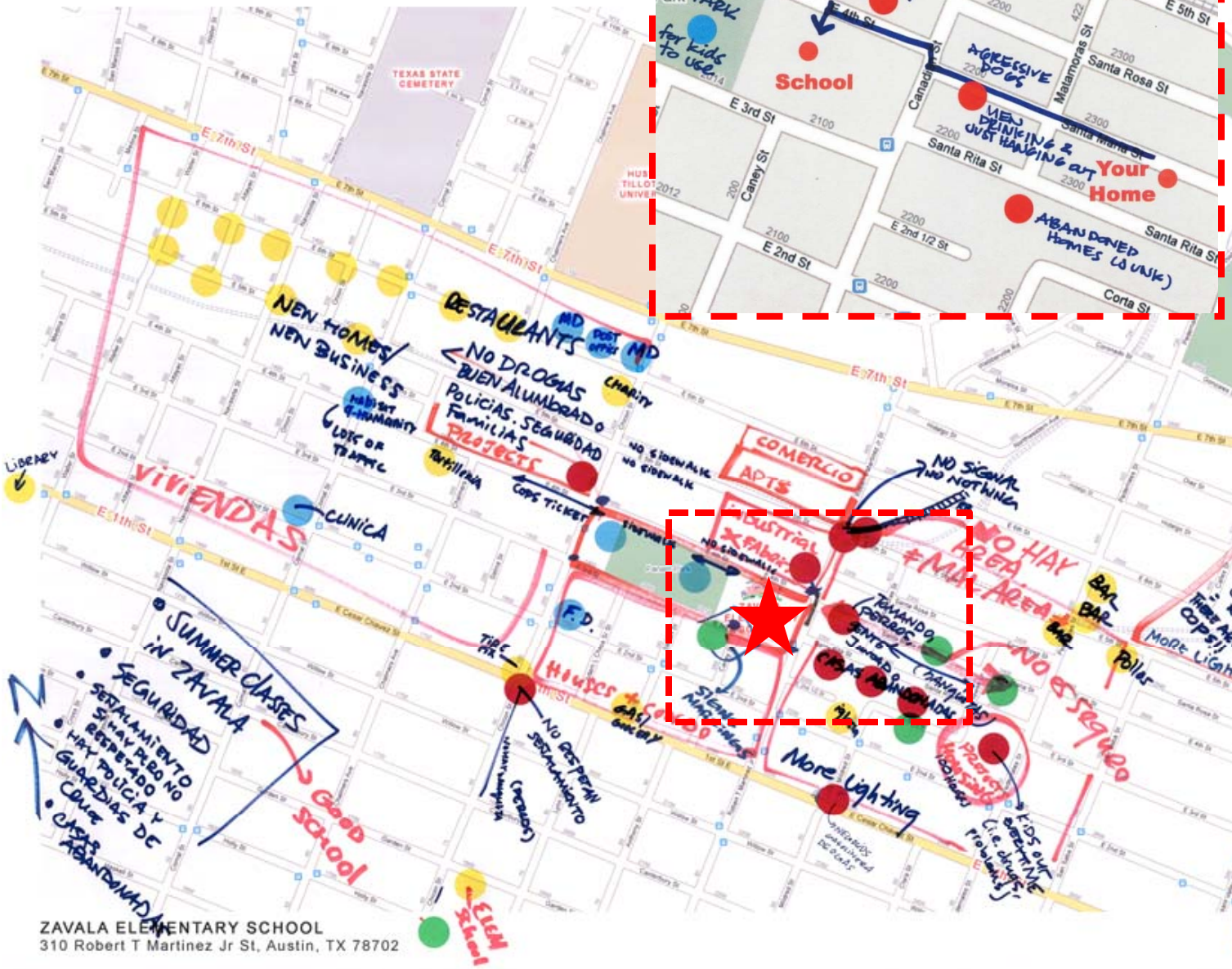
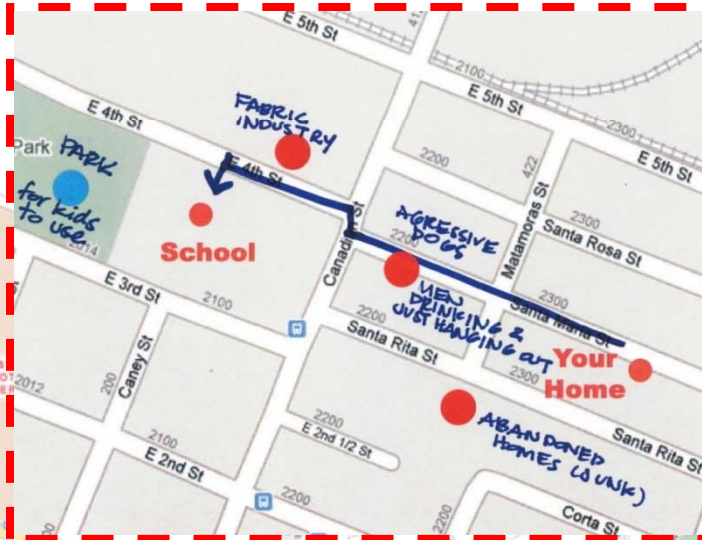


❖ Odd ratios of independent variables in predicting walking to school

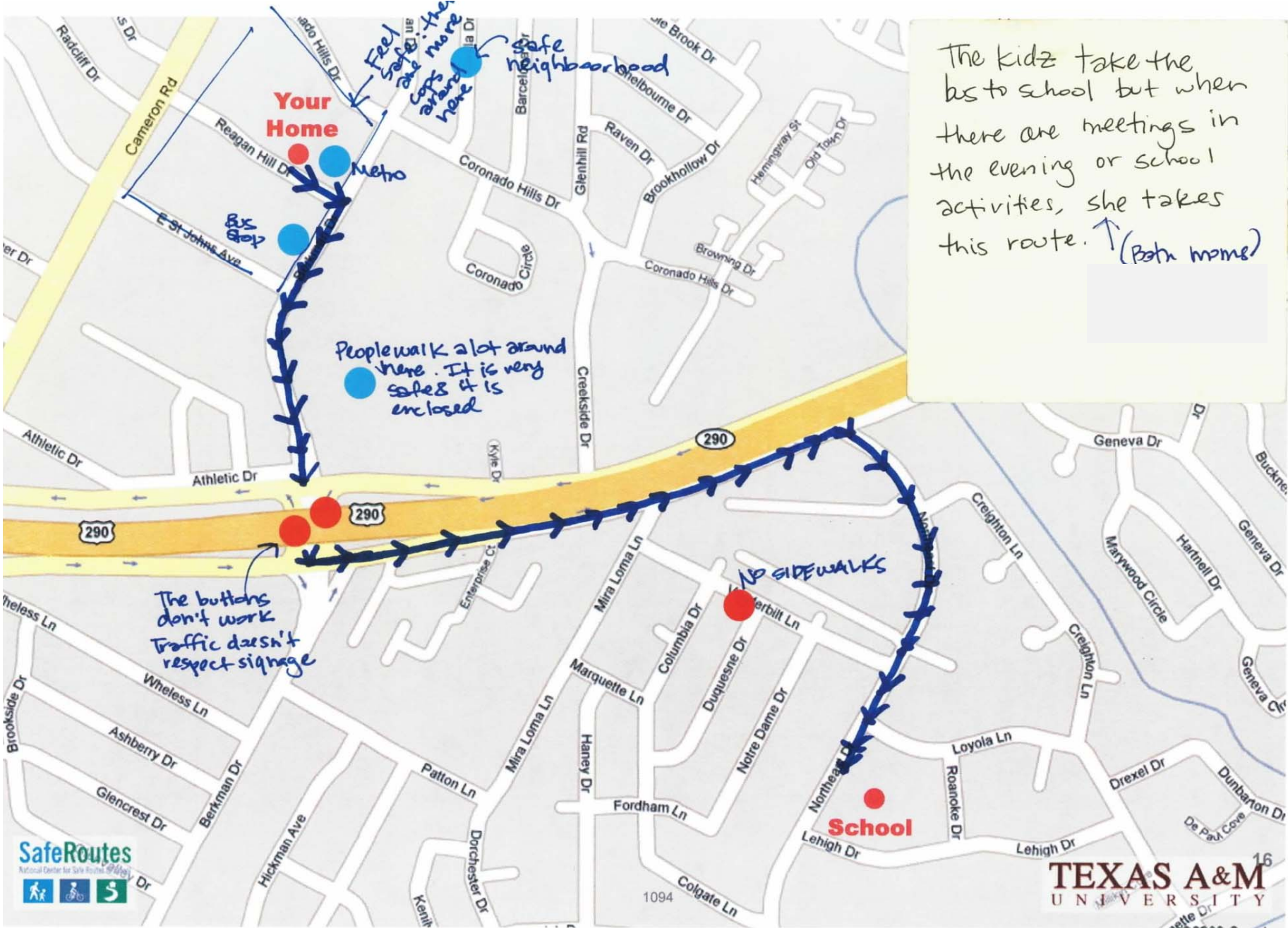
Variables		All schools ^a (n=680)	Inner city (n=110)	Urban, with freeway (n=242)	Urban, no freeway (n=126)	Sub-urban (n=202)
Socio-demographic factors	Child's gender (1=male)	0.810	1.293	0.708	0.704	1.268
	Child's grade level	<u>1.112</u>	<u>1.423*</u>	1.109	1.196	1.109
	Number of family members	1.058	1.015	1.018	0.846	0.809
	Household's car ownership	0.830	1.002	0.934	0.678	0.666
	Parents' highest education level (range: 1–7)	0.756**	0.624	0.583**	0.686*	<u>3.018*</u>
	Hispanic ethnicity (1=yes)	0.872	1.726	0.179*	1.277	1.754
Personal attitude & habit	Positive attitudes & regular walking (<i>factor</i>)	<u>1.516***</u>	1.568	<u>1.791*</u>	<u>2.297**</u>	1.773
	Child's personal barriers (<i>factor</i>)	0.712**	0.849	0.729	1.156	0.261***
	Parents' personal barriers (<i>factor</i>)	0.416***	0.412*	0.334**	0.487*	0.166***
Social factors	School influence: bus service availability (1=yes)	0.303**	0.125	0.780	1.025	0.024*
	Positive peer influence (<i>factor</i>)	<u>1.268</u>	1.190	1.281	1.152	<u>3.262**</u>
Safety	Parental safety concerns (<i>factor</i>)	0.962	0.479*	<u>1.687</u>	0.840	1.764
Perceived Physical Environment	Distance close enough (1=yes)	<u>3.279***</u>	<u>3.940</u>	<u>20.535***</u>	1.627	6.548
	Convenience store en route en route (1=yes)	0.322***	0.509	0.522	0.244*	0.000
	Vacant lot en route en route (1=yes)	0.584	0.981	0.798	0.631	0.131*
	Large parking lot en route (1=yes)	0.798	0.265	1.306	0.641	1.528
	Cross a highway or freeway en route (1=yes)	0.278**	0.173	0.189*	0.666	0.686
	Quality of overall walking environment (<i>factor</i>)	0.769*	0.849	0.555*	0.734	1.488
	Sidewalk availability and quality (<i>factor</i>)	1.210	1.139	<u>1.928*</u>	0.582	1.655
Self-selection	Close distance to school (0=no, 1=yes)	1.255	2.107	0.734	0.559	<u>3.892*</u>
	Ease of walking around (0=no, 1=yes)	<u>1.881</u>	0.479	<u>7.143*</u>	2.641	0.787

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$; # $0.5 < p < 0.1$; ^a For the model with 4 schools, dummy variables for school membership were also entered in to the model, and were not significant.

2. Focus Group Results



ZAVALA ELEMENTARY SCHOOL
310 Robert T Martinez Jr St, Austin, TX 78702

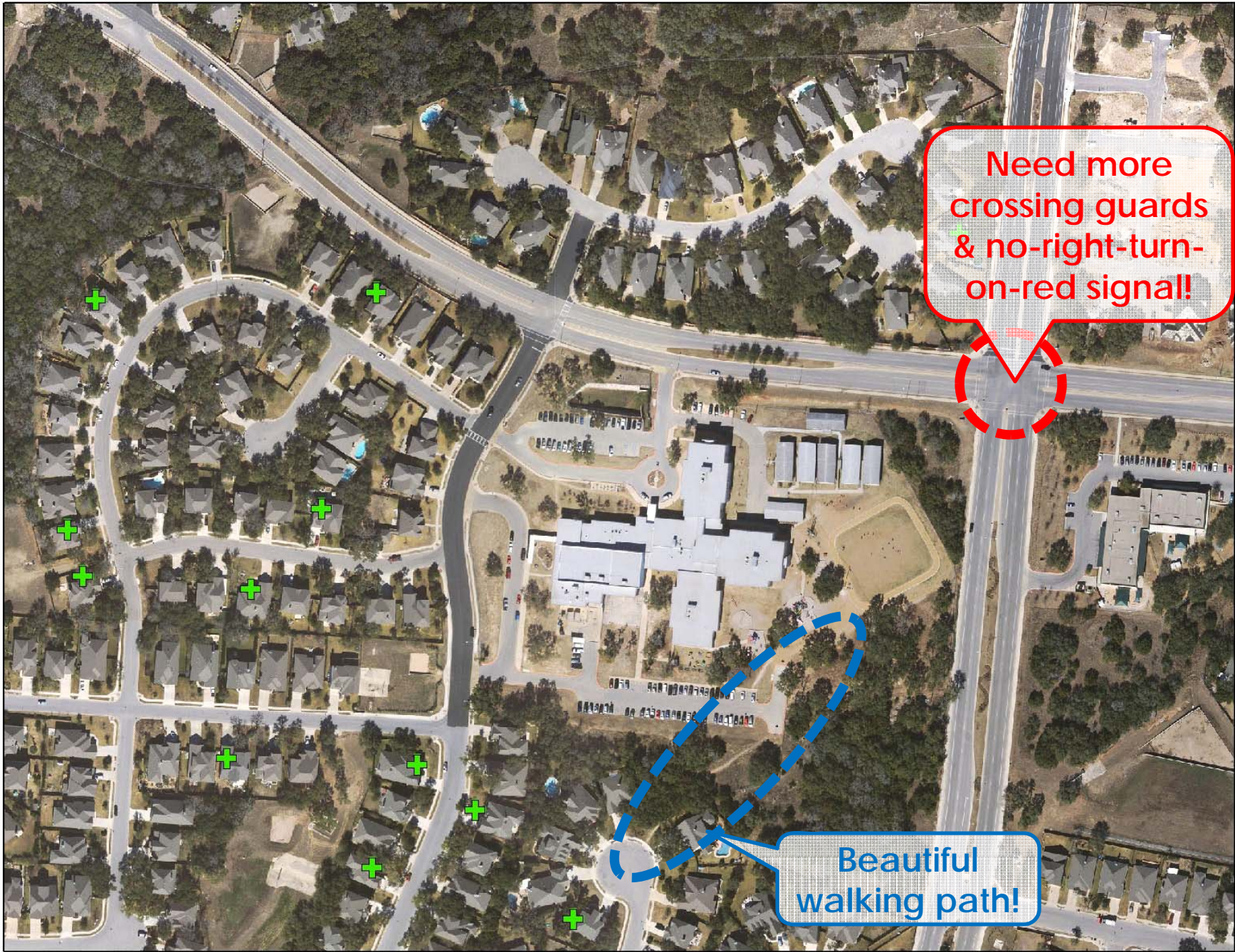


The kidz take the bus to school but when there are meetings in the evening or school activities, she takes this route. ↑ (Both homes)



Inner-city ⇔ Urban; with freeway ⇔ Urban; no freeway ⇔ Suburban

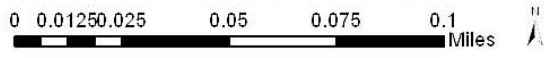
Barrier	<ul style="list-style-type: none"> • Social disorder (crime, drug, peer bullying, vacant lot) 	<ul style="list-style-type: none"> • Perceived traffic danger from environment & drivers 	<ul style="list-style-type: none"> • Highway • Lack of pedestrian crossings 	<ul style="list-style-type: none"> • Perceived traffic danger from environment
Motivator	<ul style="list-style-type: none"> • Close distance • No alternative travel mode 	<ul style="list-style-type: none"> • Close distance • Presence of police/fire station • No alternative travel mode • (Traffic law enforcement) 	<ul style="list-style-type: none"> • No alternative travel mode 	<ul style="list-style-type: none"> • Bonding with children • Health benefits of walking • Visual quality of environment • Walking path
Other findings	<ul style="list-style-type: none"> • Negative attitude (Forced to walk) 			<ul style="list-style-type: none"> • Positive attitude (Chose walking over other modes)



Need more crossing guards & no-right-turn-on-red signal!

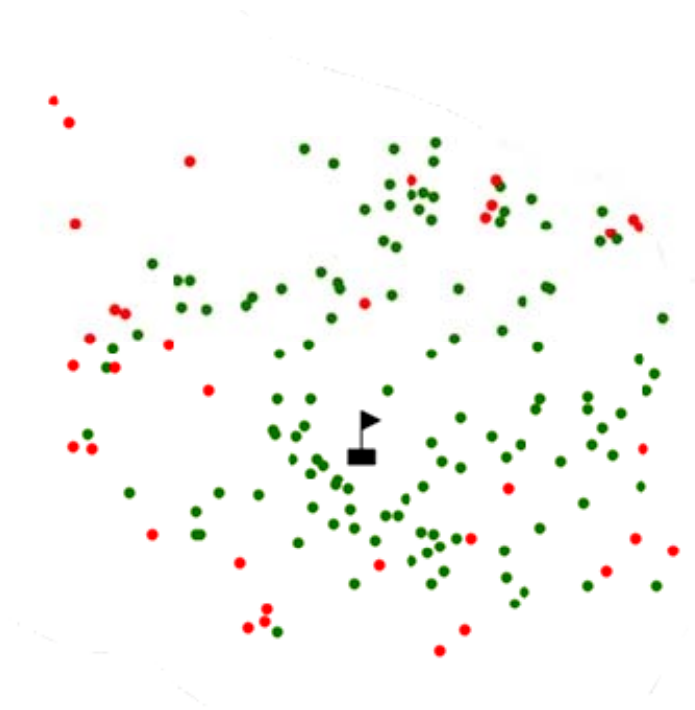
Beautiful walking path!

Suburban School

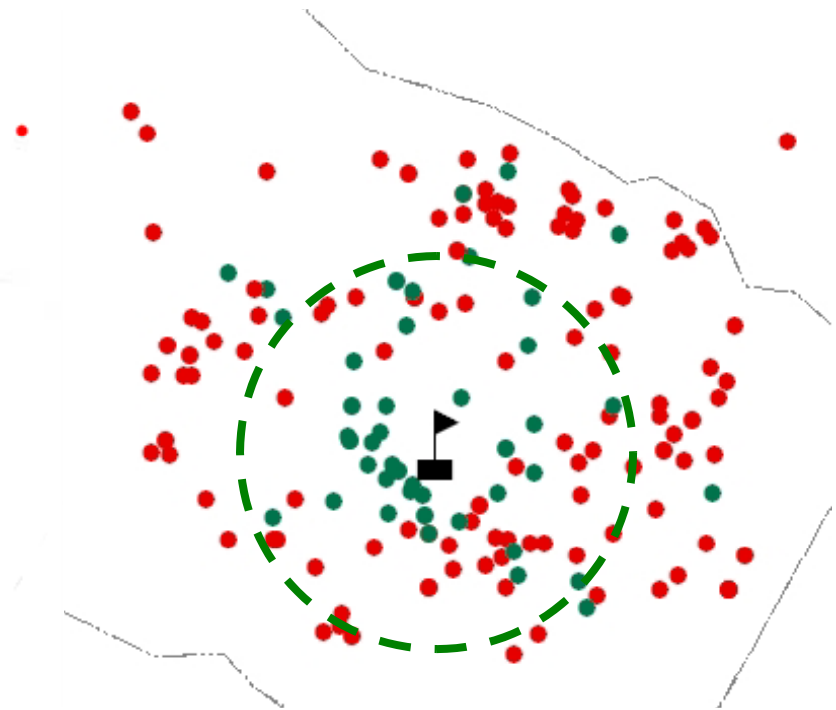


3) GIS Analysis & Field Audit

❖ Geocoded Homes & Survey Variables

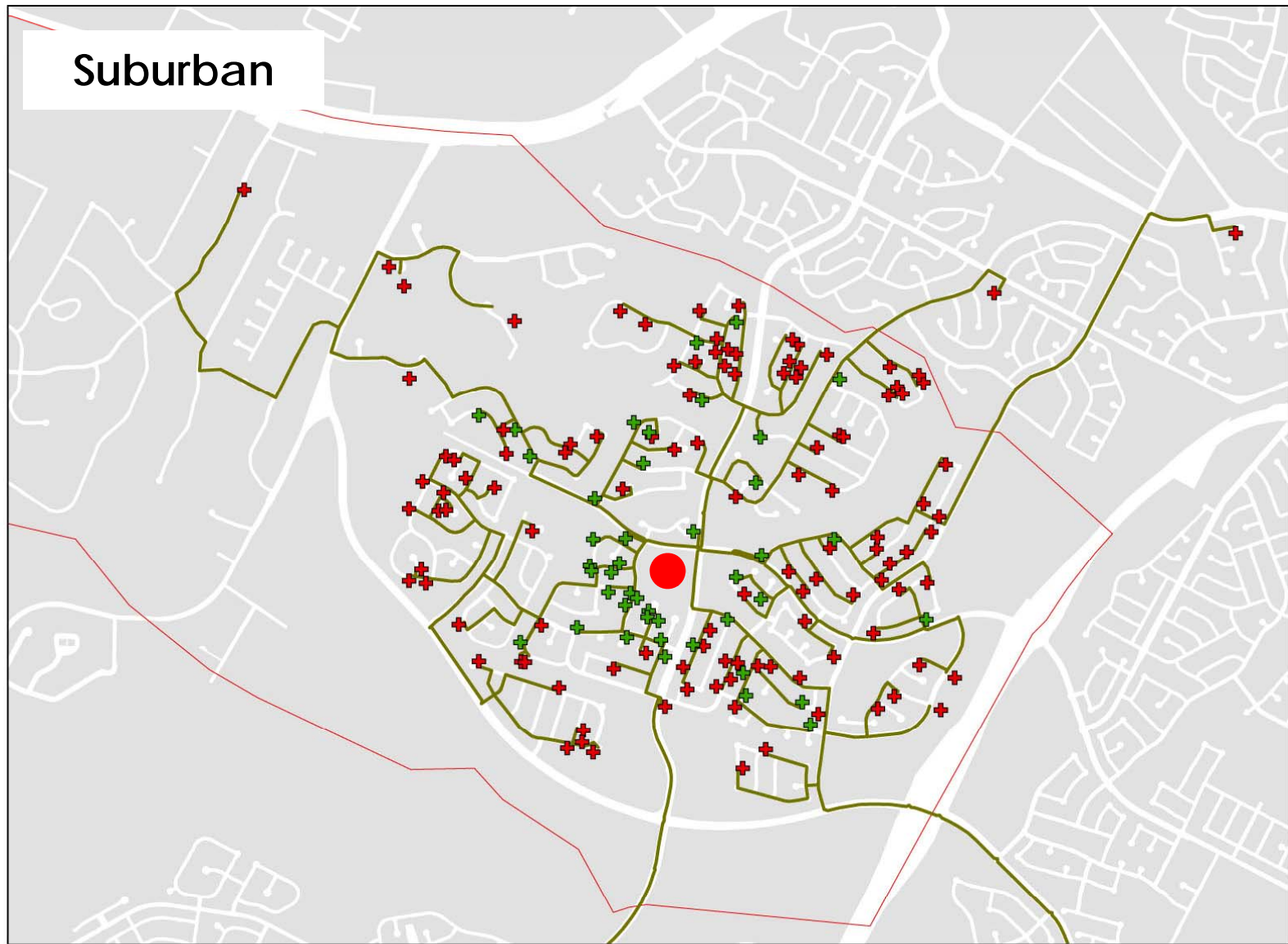


Parental perception of walkable distance



Walkers & Non-Walkers

❖ Home-to-School Routes



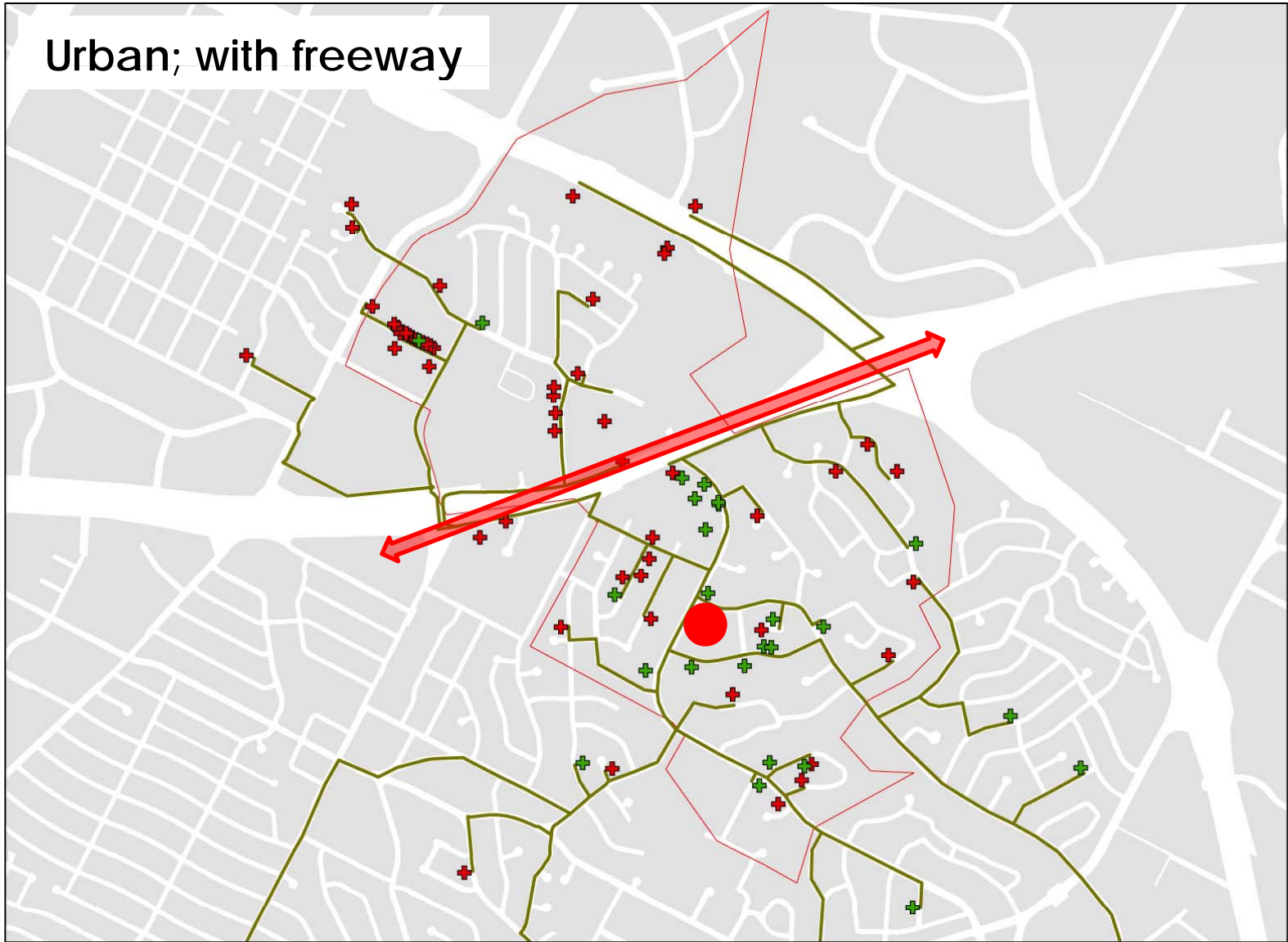
School_19_Mills: Geocoded Respondents (N = 189)

1:22,000

0 0.125 0.25 0.5 0.75 1 Miles

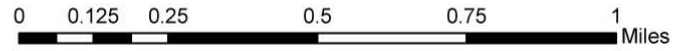


Urban; with freeway



School_1_Andrews: Geocoded Respondents (N = 219)

1:16,000



❖ Field Audit

School site



Home-to-school route



5. Conclusion

- ❖ Barriers & motivators of walking to/from school do vary across **different neighborhoods & populations**.
- ❖ **Different priorities & tailored interventions** are needed.
- ❖ Three data collection methods supplement each other in understanding this complex behavior.

Special thanks to:

- RWJF ALR Program
- City of Austin
- Austin Independent School District

Questions & comments?

Thank you!

