Evaluating the Impact of *Safe Routes to School* Infrastructure on Active Travel in Central Texas Schools: Findings from the STREETS Study

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Texas Trails and Active Transportation
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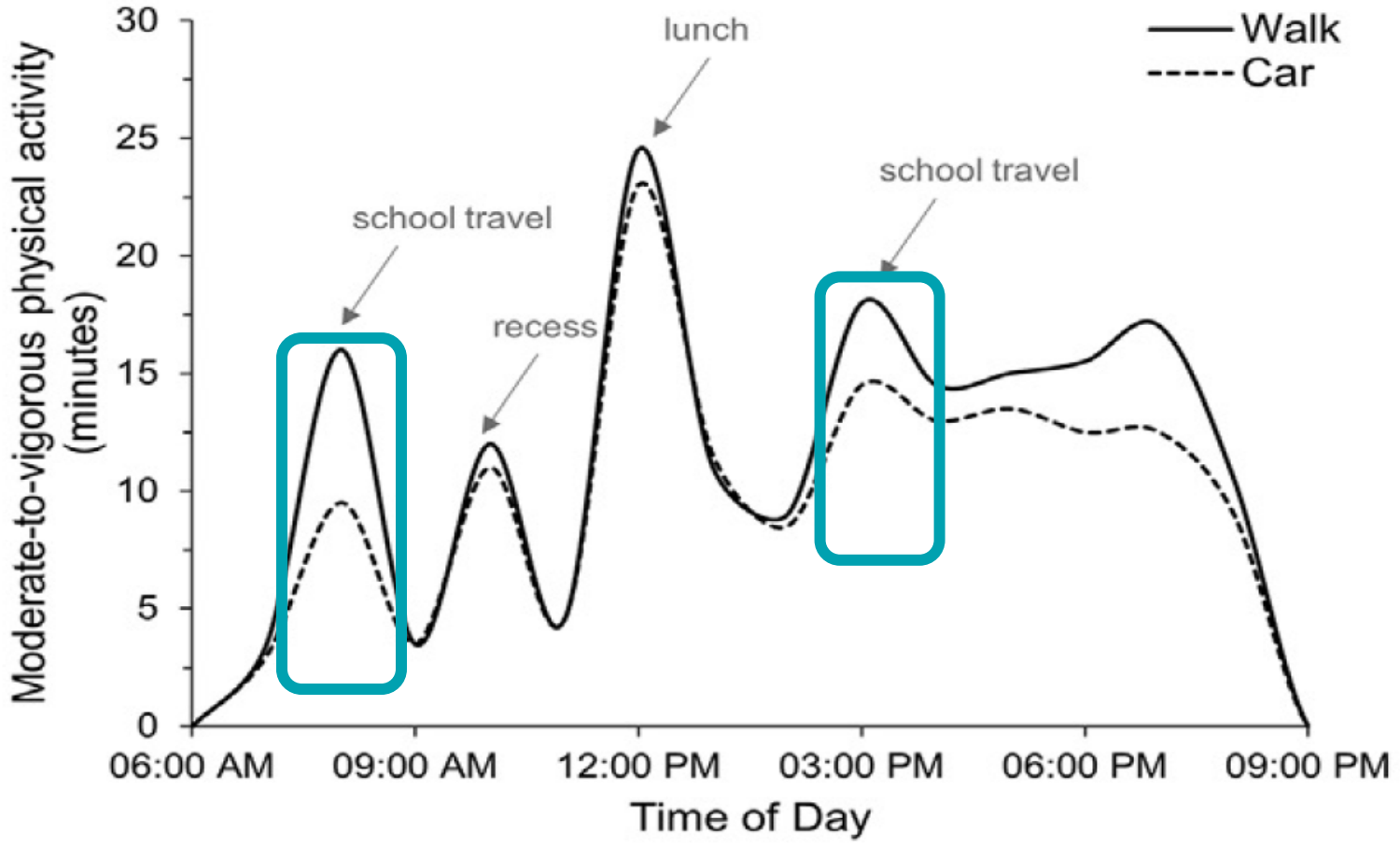
Today's presentation

1. Overview of the STREETS Study
2. Novel method for integrating accelerometry, GPS, and GIS data
3. Preliminary results:
   - Spatial equity analysis
   - Serial cross-sectional study using a teacher tally to measure modes of Active Commuting to School

Importance of active travel for children

Martin et al (2016); Cooper et al (2003); Cooper et al (2012); Campos-Garzón et al (2023)



Active school travel may contribute up to **48%** of the physical activity recommendations in young people on school days.

Public Health Benefits of Active Travel to School

- ↑ Physical activity
- ↑ Cardiorespiratory fitness (cycling)
- ↑ Cardiometabolic health
- ↑ Muscular fitness
- ↑ Mental health
- ↓ Traffic-related injuries and fatalities

Martin et al (2016); Cooper et al (2003); Cooper et al (2012); Campos-Garzón et al (2023)

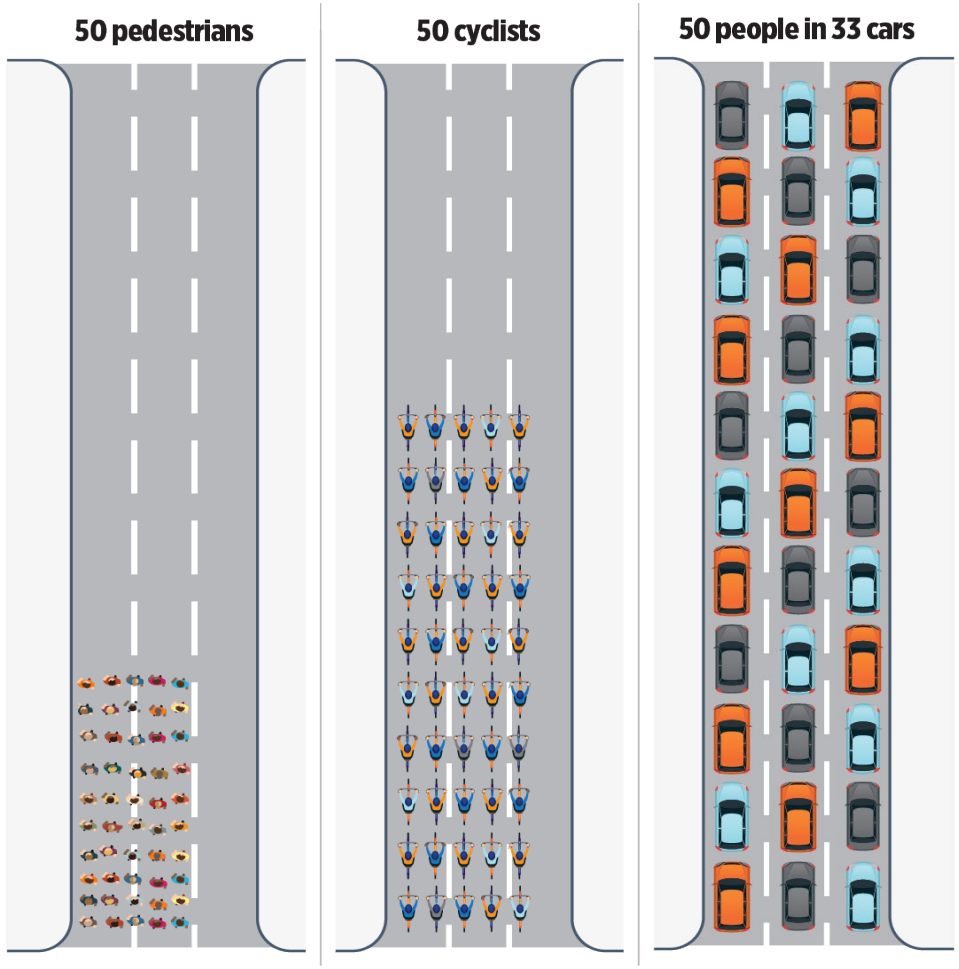
Societal Benefits of Active Travel to School

- ↓ Use of private automobiles and other motorized transport, including busing to school
  - ↓ Congestion
  - ↓ Noise in neighborhoods
  - ↑ Social cohesion
- ↓ Healthcare costs

Martin et al (2016); Cooper et al (2003); Cooper et al (2012); Campos-Garzón et al (2023)

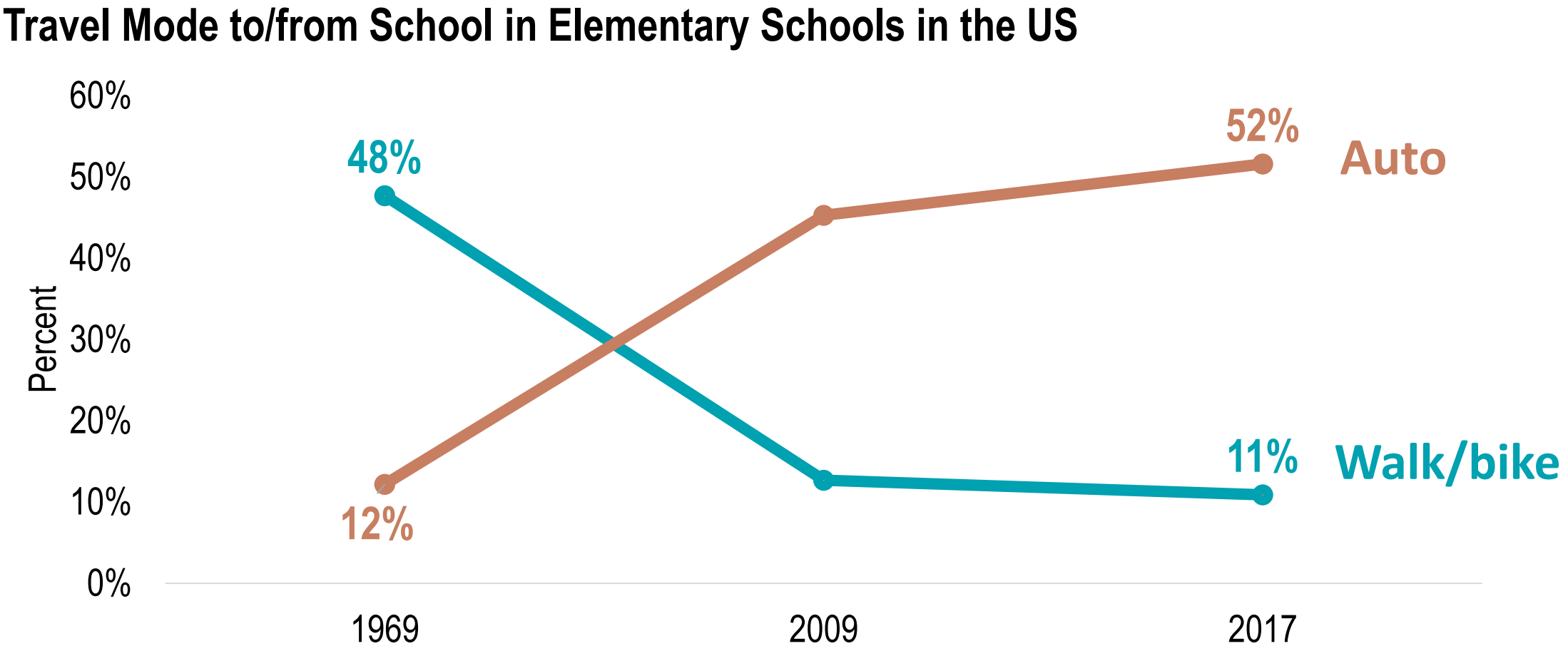
Environmental Benefits of ACS

- Small form factor
- Clean transportation
- Fewer wastes and resources



Hong et al (2018)

Status of ACS in US



Correlates of ACS

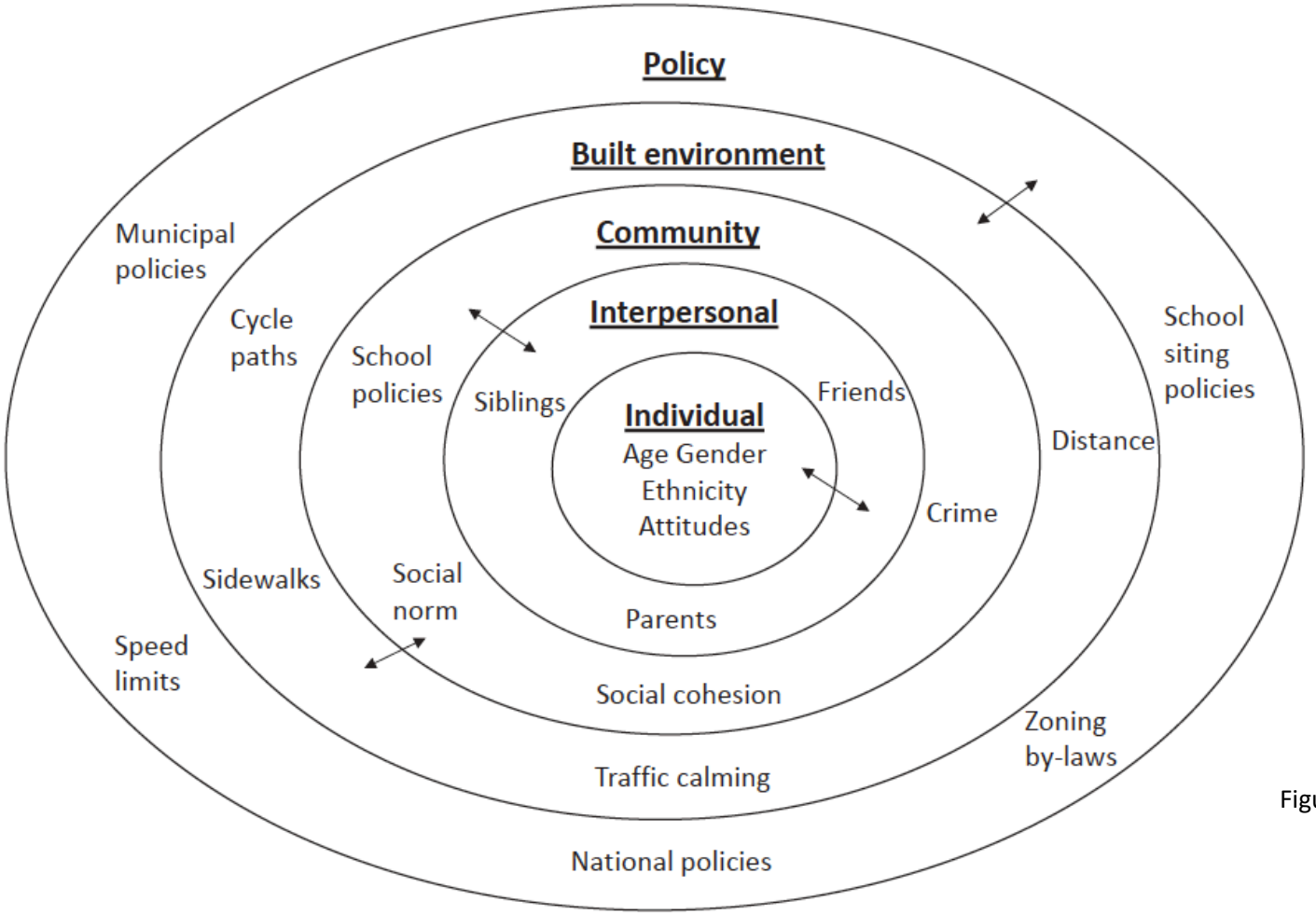


Figure from Larouche & Ghekiere (2018)

STREETS Study Overview

CITY OF AUSTIN
austin MOTION
2016 MOBILITY BOND

CITY OF AUSTIN FOUNDED 1839

PUBLIC WORKS
SAFE ROUTES TO SCHOOL

SHARE THE ROAD

STREETS
SAFE TRAVEL ENVIRONMENT EVALUATION IN TEXAS SCHOOLS

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STREETS Study Aims

To evaluate the effects of $27.5 million USD allocated to Safe Routes to School infrastructure in Austin, Texas, USA.

Aim 1

Determine effects of SRTS infrastructure changes on **child physical activity**.

Aim 2

Determine effects of SRTS infrastructure changes on **active commuting to school**.

Aim 3

Examine the **cost effectiveness** of SRTS infrastructure changes on child physical activity levels.

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Overview of quasi-experimental study design

Serial cross-sectional study

Sample

70 Austin schools with SRTS improvements
30 comparison schools

Measurements

✓ Active commuting to school tally
✓ School policy survey
✓ School demographics
✓ GIS measures of built environment

Cohort study

Sample

Subset of 30 Austin schools (3 schools per city council district)
Subset of 15 comparison schools

Measurements

✓ Accelerometer and GPS
✓ Child survey
✓ Parent survey
✓ MAPS-SRTS environmental audit

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Development of an open access tool for time-matching accelerometer and GPS data to assess the spatio-temporal patterns of active travel among children

Salvo D, Villa U, Ganzar LA, Hoelscher D. A novel tool to match GPS, accelerometer and GIS data for child active travel research

- The use of **time-matched** Geographic Positioning Systems (GPS) and accelerometry data holds great promise for better understanding the **micro-level environmental factors (street-level features)** that influence active travel behaviors.
- However, processing and analyzing these data in ways that yield **meaningful insights to answer health and place questions and inform built environment policy** remains challenging.
- We are developing an **open-source, Python based code** that time-matches QTravel BT-10000 GPS and GT3X-wBT Actigraph monitor data

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Understanding the spatio-temporal patterns and micro-scale drivers of physical activity behaviors among children

Activity spaces (GIS Integration)

Kohl, Murray & Salvo, 2025 (forthcoming)

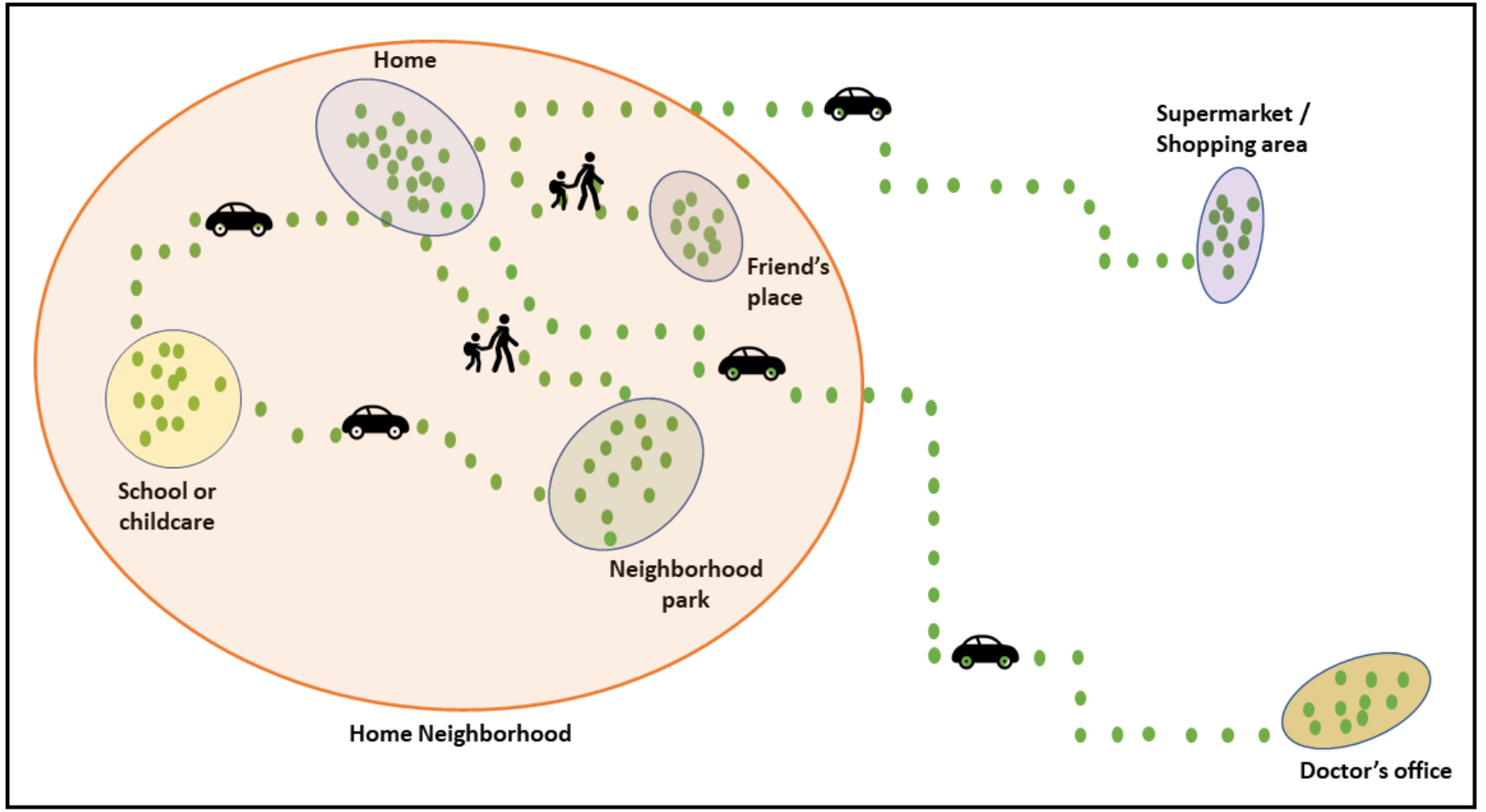
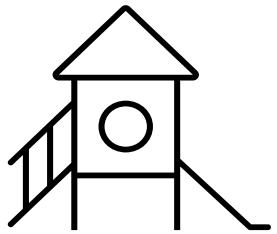


Figure 4.3. Conceptual representation of a child's "activity space" data measured with GPS monitors. A person's activity space includes the usual spatial patterns of their everyday life, and therefore, where physical activity can take place. Round/oval clusters represent commonly visited locations, while routes between locations represent trips by various travel modes (active modes include walking and cycling, sedentary modes include car trips).

Preliminary Results:
Spatial Equity Analysis of Access to Activity-Promoting Assets in School Neighborhoods

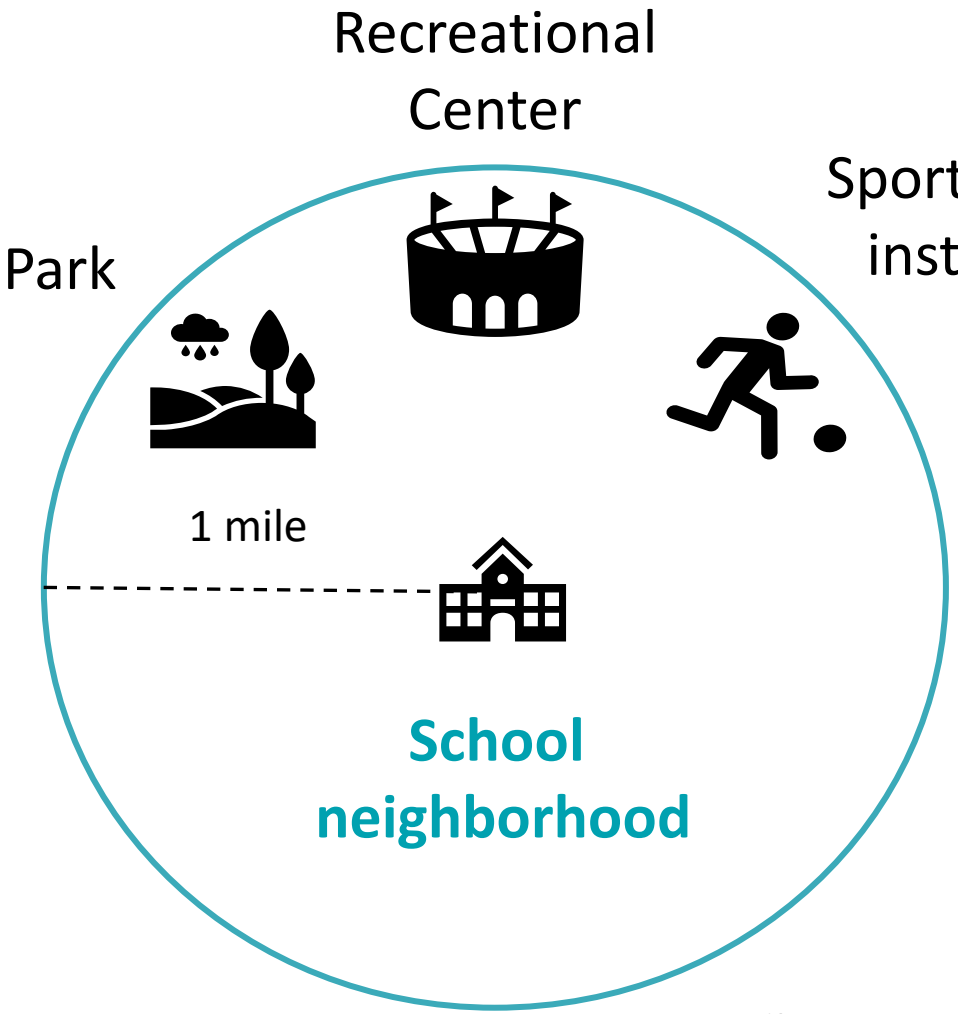
Recreational Assets for Physical Activity

Research questions



Availability

Income level
Racial/ethnic diversity



Recreational Assets for Physical Activity

83 public elementary schools

55% high racial/ethnic diversity

35% low park availability

19% no recreational centers

36% no sports/fitness instruction

- ✓ Higher-income (vs. low) neighborhoods were less likely of having **medium-high park availability** and **any sports/fitness instruction**
- ✓ High-diversity (vs. low-some) neighborhoods were less likely of having **any recreational center** and **any sports/fitness instruction**

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Preliminary Results:

Effect of *Safe Routes to School* Infrastructure changes on Active Travel to School Participation

Preliminary Results: *Active Travel to School* rates before construction

Before construction, Austin schools had a **5.7% decrease** in Active Travel to School in Fall 2019, compared to schools before construction in the Spring 2019.

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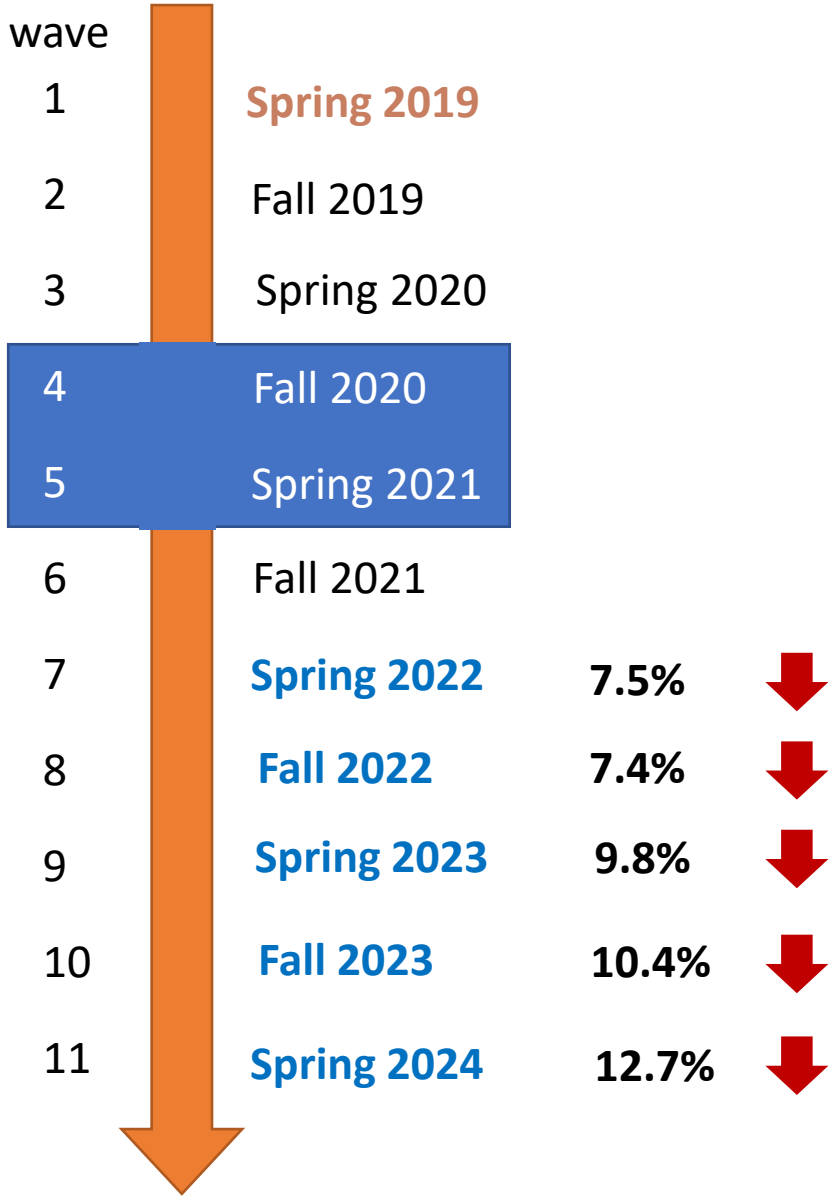
Preliminary Results: *Active Travel to School* rates during construction



During construction, Austin schools' active travel to school participation was lower, as compared to before construction in the Spring 2019.

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Preliminary Results: *Active Travel to School* rates shortly after construction is completed

- ✓ During construction: Austin schools had a **7.4%** decrease in %ACS
- ✓ Construction complete: Austin schools had a **7.1%** decrease in %ACS

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Data analysis for other study components remains underway and will be completed in the next few months…

STAY TUNED FOR MORE!

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- Dr. Leigh Ann Ganzar
- Dr. Kevin Lanza
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Thank you!

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