Twin Cities Walking Study

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Twin Cities Walking Study

1. What we set out to do
2. What we did
3. Data we have
4. Very early findings
5. Methodological/measurement innovations
6. What we hope to do next

1. What We Set Out To Do
Study Design

- Cross-sectional study with measures of:
  - Physical environment of 36 specific residential areas
  - 20 randomly selected Individual residents of the areas included in the study (Goal N = 720)
- Repeatability sample of 20% for all measures
- Pilot testing of all individual level measures on diverse sample of 40
 - Time to complete survey and acceptability of survey

1. What We Set Out To Do
Hypotheses

- Hypothesis 1: High density, high street connected neighborhoods ↑ walking behavior.

- Hypothesis 2: Those who perceive the environment to be more walkable will walk more.

- Hypothesis 3: Other observed and perceived physical and socio-cultural features of the environment will explain variance in walking behavior.

- Hypothesis 4: Individual-level variables will mediate relationships between environment and walking.

2. What We Did
Selecting Neighborhoods & Environmental Measures

Urban edge

Downtown Minneapolis

Downtown St. Paul

8 km
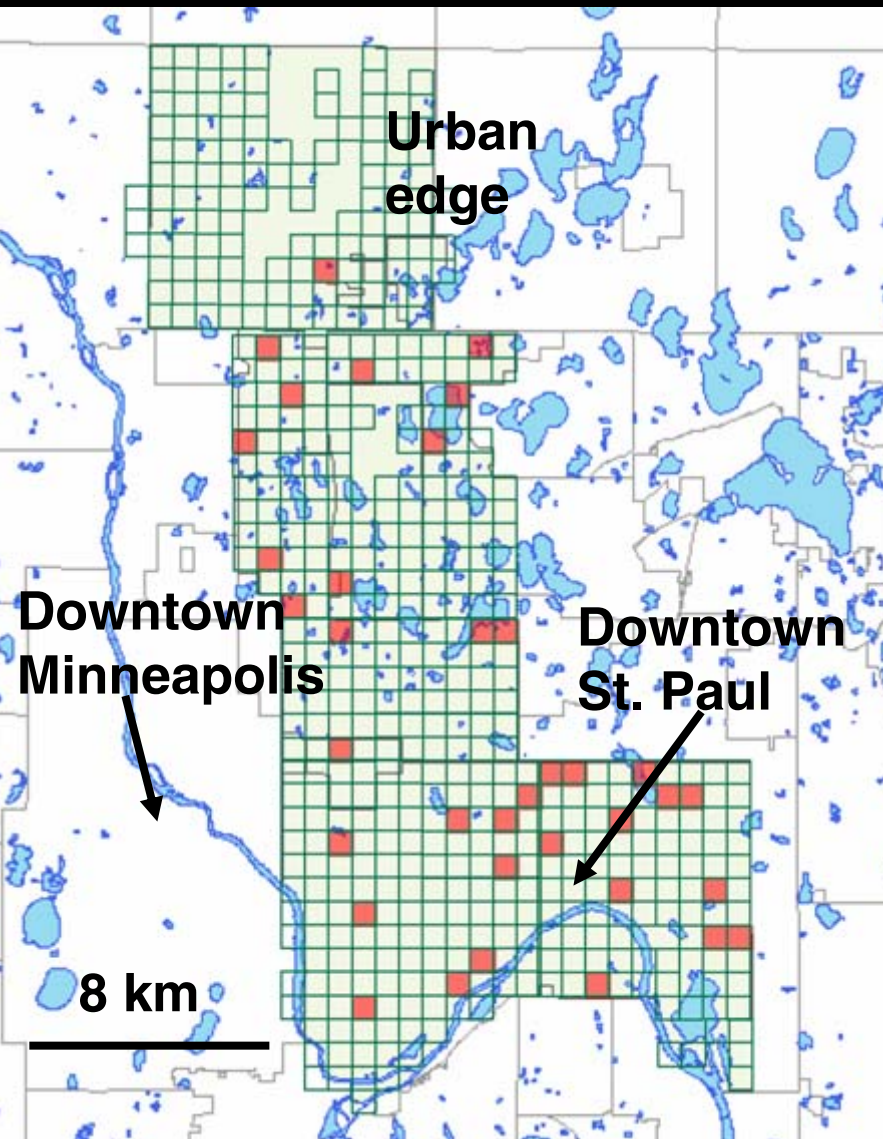
- 36   805*805 meter areas in corridor from St. Paul to Blaine
  - Vary by combinations of high/low gross density + median block size
  - 9 big blocks/high density, 9 big blocks/low density, etc.

- 50+ environmental variables
  - GIS—existing, digitized, inventory

- 718 participants

- Environmental measures at multiple geographies around each participant
  - Distances to nearest features
  - Network + straight line buffer
  - Grid cells

Area 30:
High Gross Density—15.8 persons/acre, 39/ha
Small Median Block—3.7 acre, 1.5 ha
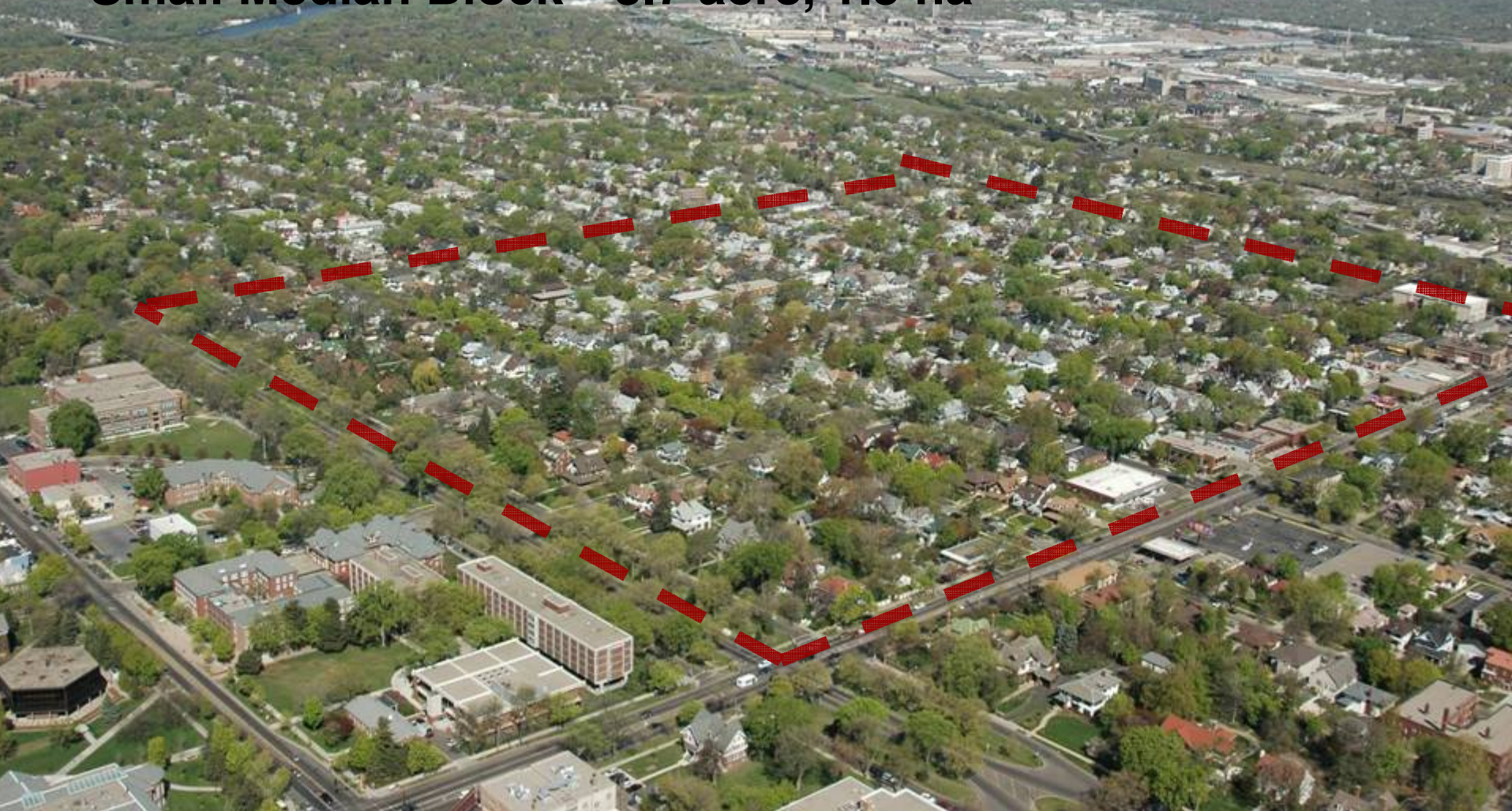
Area 3:
Low Gross Density—4.7 persons/acre, 11.6/ha
Large Median Block—11.1 acres, 4.5ha

2. What We Did
Who We Studied

Eligibility criteria for individual residents

- 25 and older
- Primary residence in one of the 36 neighborhoods
- Able to give informed consent
- Able to walk unaided for 20 minutes
- Not out of town during week of data collection

Description of participants (N = 718)

- 67% with household income $40-90k
- 47% college graduates
- 29% BMI over 30
- 74% randomly selected

2. What We Did
Data Collected with Individual Residents

- 7-day travel diaries (N=718)
- 7-day accelerometer records (N=718)
- Measured height and weight (N=718)
- Participant-drawn maps of self-defined neighborhood (N=717)
- Telephone interview (N=718)
  - NQLS Survey
    - IPAQ
    - Physical environment perceptions
    - Social environment perceptions
    - Psychosocial predictors of PA
  - Demographics (NHTS)
  - Quality of Life
  - Neighborhood definition
  - Dog ownership
  - Bicycle ownership/use/safety

3. Data
Broad Topics We Can Examine

- How different aspects of measured and perceived environment correlate with physical activity
- Environment
    - Density
    - Street pattern
    - Mixed use
    - Pedestrian amenities
    - Socioeconomic variables
- Physical activity
    - Physical activity in specific domains from IPAQ
   - Objectively measured PA from accelerometry

4. <u>Very Early</u> Findings
IPAQ Survey Data and Focus Area Density and Block Size Data

- Hypothesis 1: High density, high street connected neighborhoods ↑ walking behavior

- Have examined self reported physical activity for focus areas stratified by gross density and median block size.

IPAQ Walking Activity
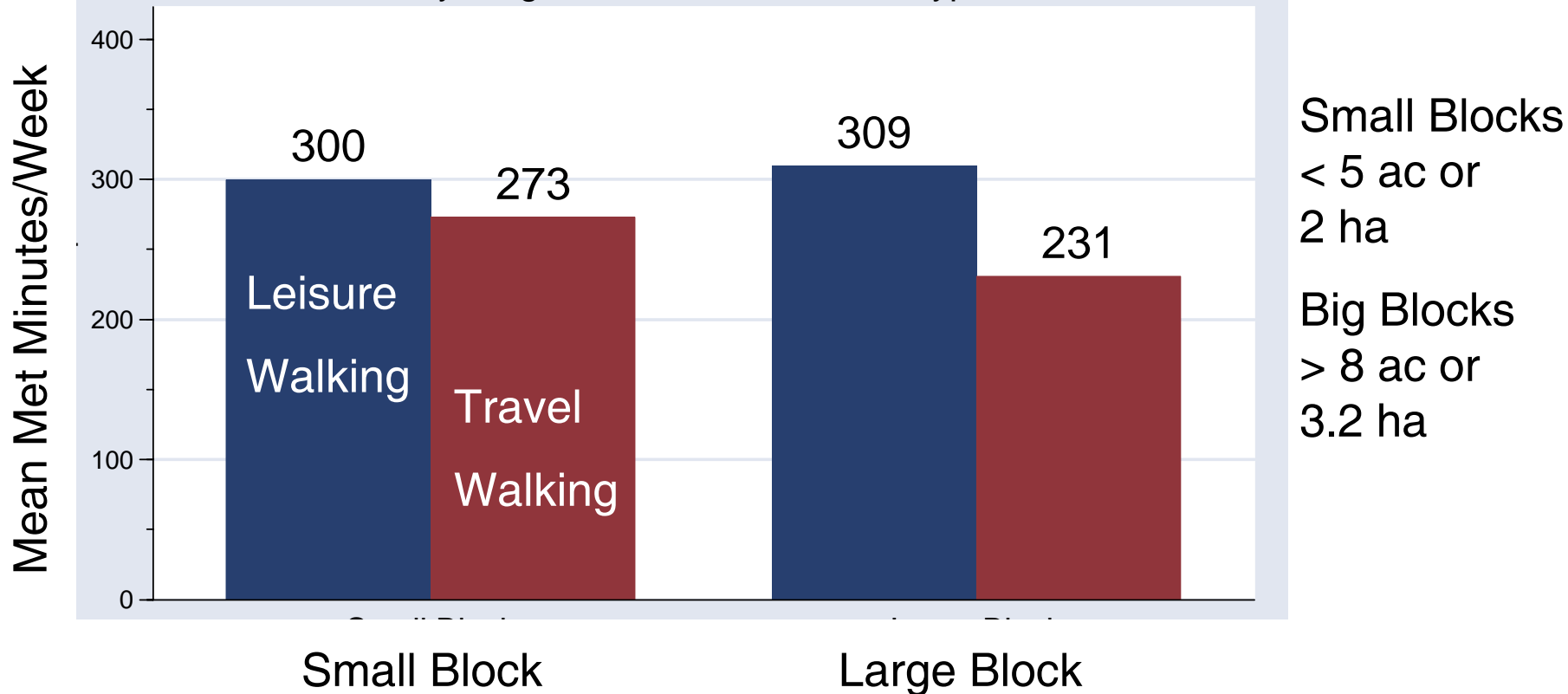by Neighborhood Density & Type
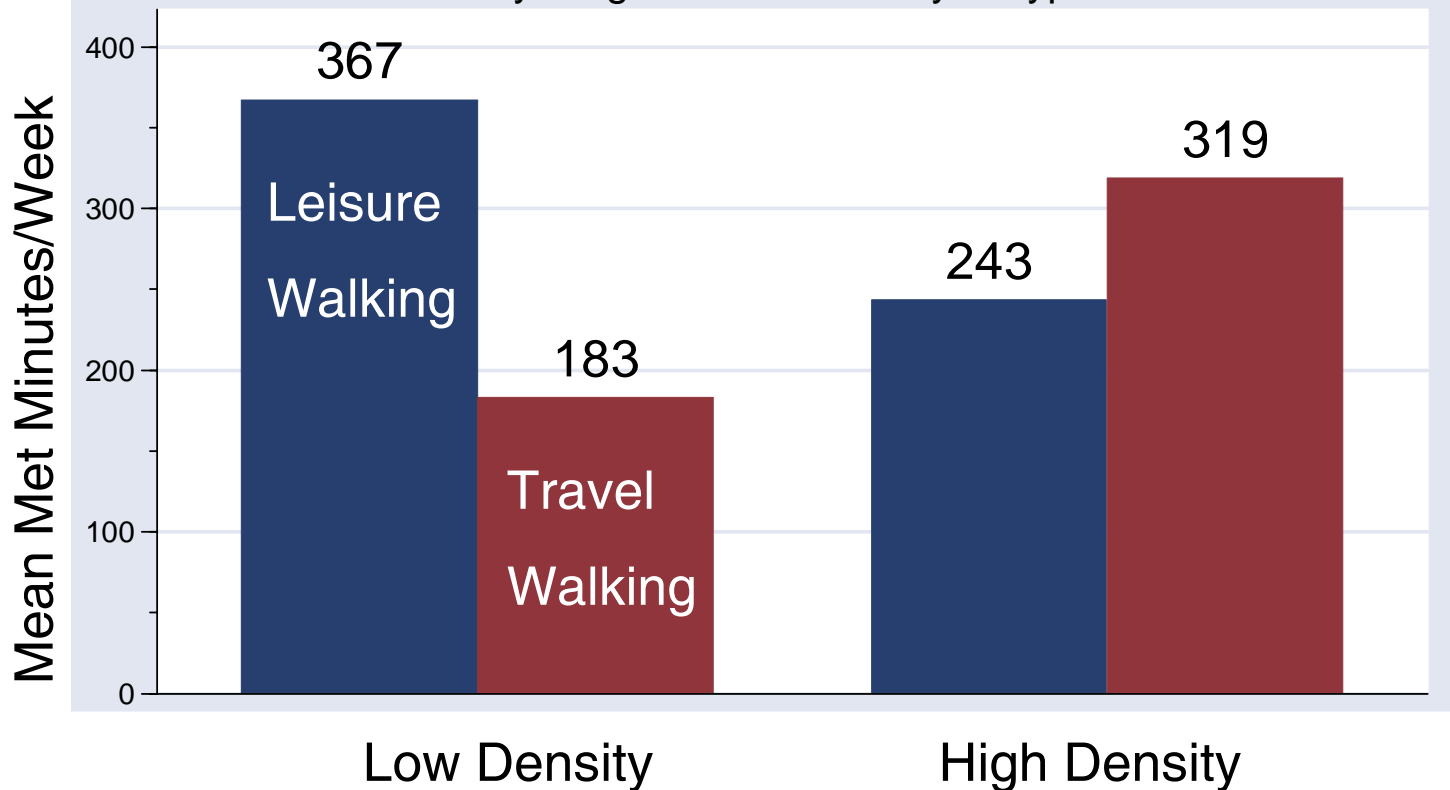
- **Both** leisure walking and travel walking are statistically significantly different by **density** ($p<0.001$)
- Significant differences remain significant after adjusting for age and income of respondent
- **Neither** total PA nor BMI statistically differ by **density**

IPAQ Walking Activity
by Neighborhood Block Size & Type

Mean Met Minutes/Week

300	273	309	231

Leisure Walking — Travel Walking

Small Block — Large Block

Small Blocks < 5 ac or 2 ha

Big Blocks > 8 ac or 3.2 ha

- **Both** leisure walking and travel walking are **not** statistically significantly different by **block size**
- Relationships remain insignificant after adjusting for age and income of respondent
- **Neither total** PA nor BMI statistically differ by **block size**

4. <u>Very</u> <u>Early</u> Findings

<u>Hypothesis 1: High density, high street connected (small block) neighborhoods ↑ walking behavior.</u>

- High density focus areas have more self-reported travel walking but less leisure walking than low density areas. Total walking does not differ.

- Focus areas with small blocks have no difference to big blocks in leisure or travel walking.

- Total self-reported PA and (measured) BMI do not differ by either density or block size.

- But there are lots of variables left to analyze including accelerometry + many environmental measures!

5. Methodological and Measurement Innovations

Models (Propensity Scoring)

- Working toward a causal model (vs. predictive)

Measurement

- Testing and modifications to the Boarnet + Day/Irvine-Minnesota urban design inventory

- Developing comprehensive set of GIS-based environmental measurement protocols

- 7-day travel diary

Recruitment

- Novel recruitment plan made use of media relations expertise to 'condition the market'

6. What Next?
Models and Measures

- Focus on careful methodological work
  - Models
  - Measures
- Proposing to replicate study elsewhere in the Twin Cities
  - Cross-validation of models built with this data
- Smaller cross validation studies in Europe and elsewhere in the U.S.

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