THE UNIVERSITY OF QUEENSLAND
AUSTRALIA

Create change

ACTIVE LIVING RESEARCH CONFERENCE 2018

FEBRUARY 11–14, 2018 | BANFF, CANADA

ACTIVE LIVING RESEARCH
ELSEVIER
ALBERTA CENTRE FOR Active Living

A novel approach to investigate the impact of the built environment on physical activity among young adults

Behrang Assemi, Belen Zapata-Diomedi, Claire Boulange

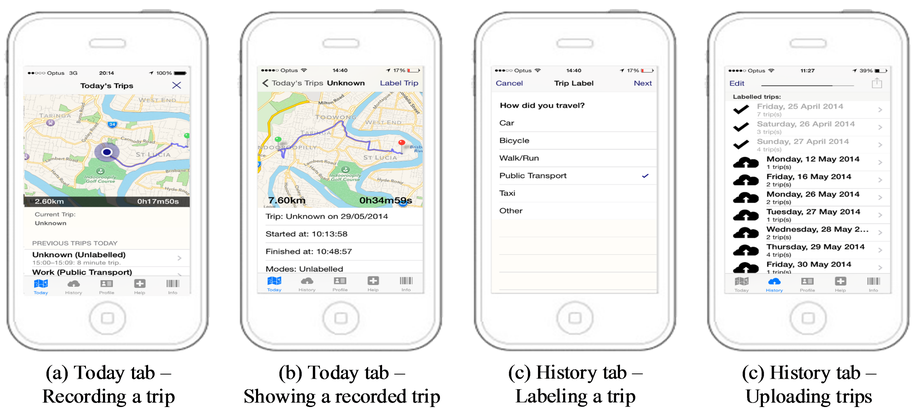
Introduction

- The **built environment** can "facilitate" or "hinder" **physical activity (PA)**, including walking and cycling for transport purposes.
- The greatest majority of the evidence relies on **self-reported measures** of PA.
- **Questionnaires** have a **low level of accuracy** and are more prone to **self-reporting biases**, compared to devices such as accelerometers and pedometers which serve to objectively measure PA.
- Relying on the technological advancement and widespread accessibility of smartphone**,** this study introduces a **custom-designed smartphone app** to **collect PA data during transport** and, shows how the data collected by the app can provide us with **insights** about young people's **transport-related PA** in relation to the built environment and trip characteristics.
- Understanding PA during travel is relevant to support investments and programs that **support sustainable modes of transport**, such as walking and cycling.

Methods

Data Collection: Designed and implemented a smartphone app for both iOS and Android platforms:

- automatically captures all movements of its users;
- includes post-processing algorithms that detect the types of activities within a trip



(a) Today tab – Recording a trip | (b) Today tab – Showing a recorded trip | (c) History tab – Labeling a trip | (c) History tab – Uploading trips

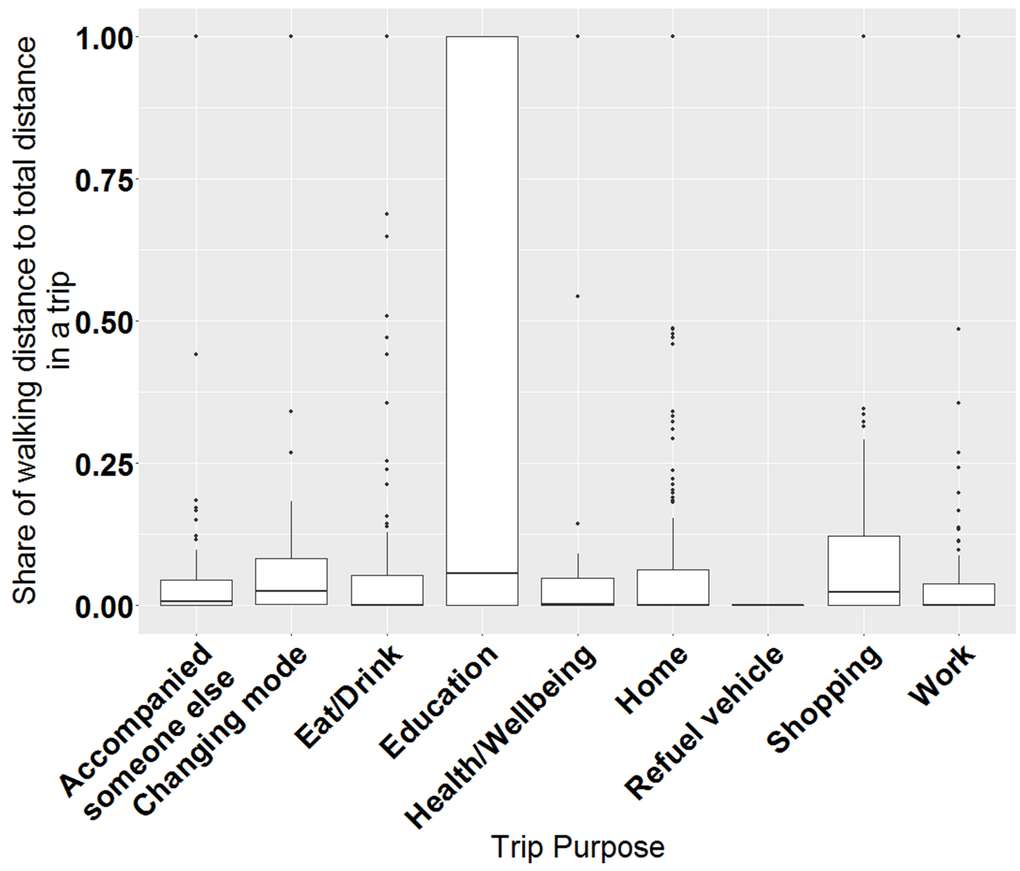
Data: Data from 142 university students in Brisbane, Australia:

- collected for an average of 3 days per participant;
- include 422 person-day observations and a total of 2024 single modal activities

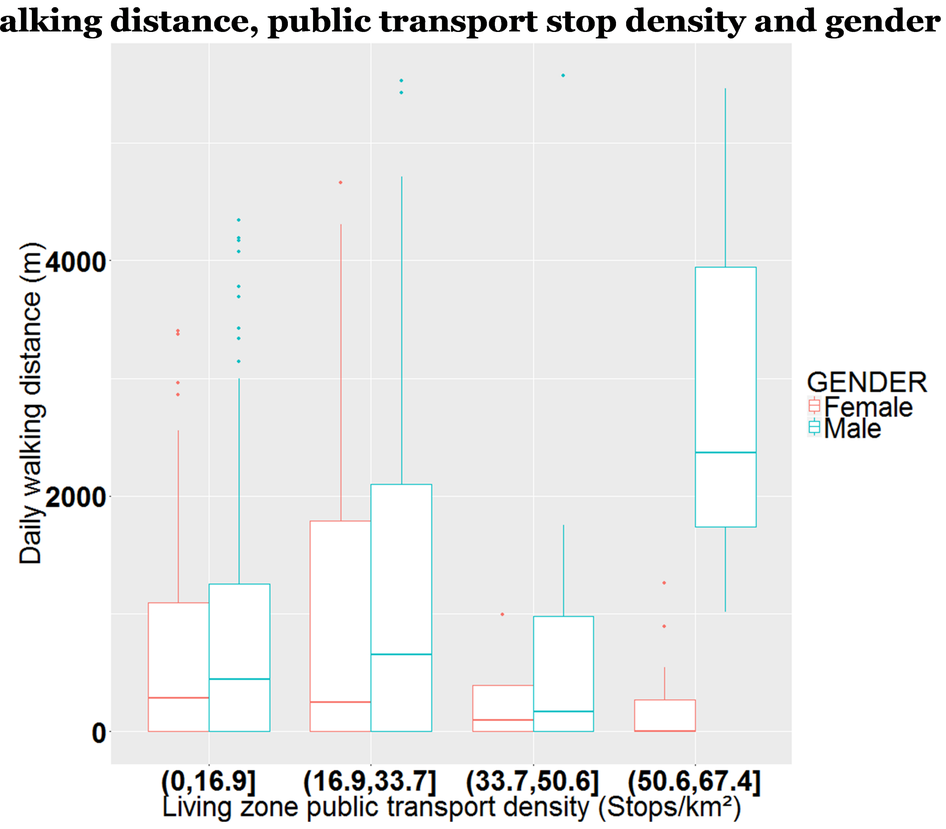
Data Analysis: We conducted statistical and spatial analysis using R, RStudio and QGIS including:

- descriptive analysis and exploratory analysis;
- pooled ordinary least squares analysis with panel data to model the impact of built environment attributes and trip characteristics on transport-related PA.

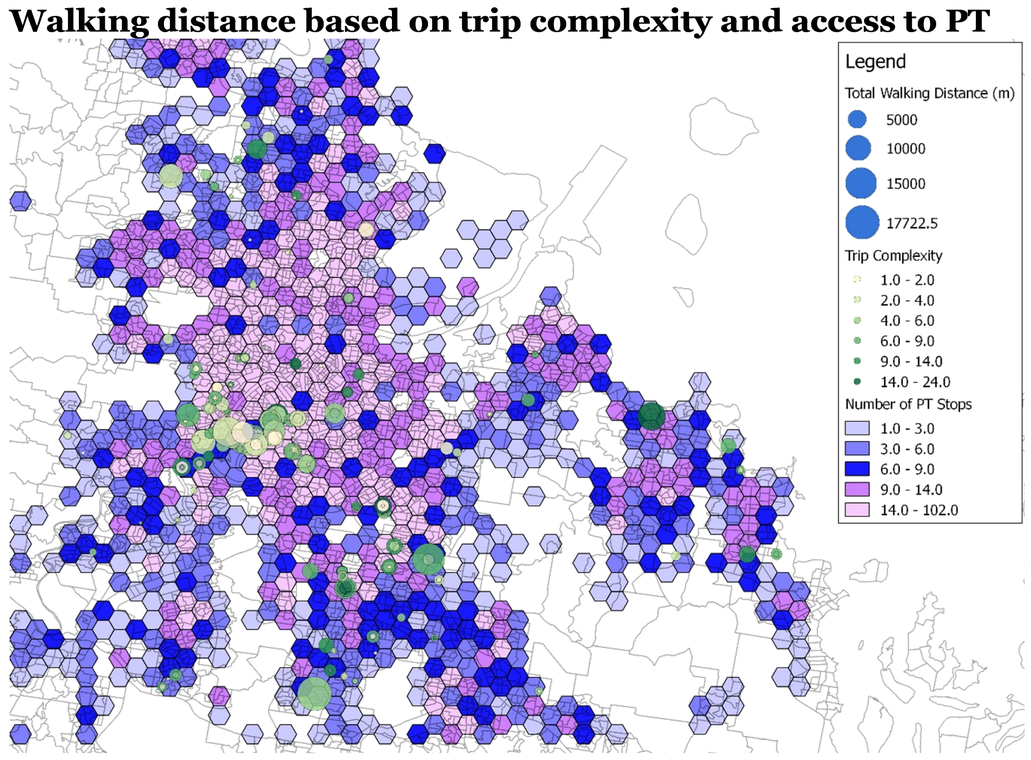
Exploratory Analysis Results



Walking distance, public transport stop density and gender



Walking distance based on trip complexity and access to PT



Pooled OLS Model

Dependent Variable: Walking Distance

Variable		Estimate	Std. Error	$t - value$
Intercept		1296.545*	736.403	1.761
Home public transport accessibility (mean distance to 5 closest stops – m)		0.078	0.631	0.123
Stop Density	$16.9 < Density <= 33.7\ /km^2$	59.027	283.462	0.208
	$33.7 < Density <= 50.6\ /km^2$	1276.07**	568.826	2.243
	$50.6 < Density <= 67.4\ /km^2$	326.373	554.076	0.589
Trip complexity (triplegs / travel day)		231.2****	43. 85	5.272
Total distance travelled per day (m)		−0.012***	0.004	−2.665
Car access		−1040.154****	278.603	−3.733
Bike access		222.604	387.736	0.574
Age	21-30 years	−379.138	256.084	−1.481
	41-50 years	−2164.701***	662.563	−3.267
	51 years or more	−1101.594	928.03	−1.187
Job – Working		1606.517****	449.64	3.573
Weekly Income	$200-$299	−89.353	294.111	−0.304
	$300 or more	−667.665**	316.699	−2.108
HH Siz	2 – 4 persons	−102.075	515.587	−0.198
	5 or more persons	−336.513	528.579	−0.637
Gender – Male		56.011	260.36	0.215
SA1 per cent population in medium dis/advantaged quantile (40%-60%)		14.891*	7.764	1.918

Table description: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$, **** $p < 0.001$

$R^2 = 0.215$, $Adjusted\ R^2 = 0.165$, $F(18,282) = 4.288$, $p < 0.001$ $Max\ VIF = 3.20$

Contact Details

Email: b.assemi@uq.edu.au Tel: +61 (7) 344 31123 Website: www.uq.edu.au

Address: Office 412, Hawken Engineering Building (50), The University of Queensland, St Lucia, Queensland 4072, Australia