

How much walking do Sydneyiders do in their daily life? Evidence from the Household Travel Survey

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Source: http://www.tripadvisor.com.au/Attraction_Review_g255060-d1113298-Reviews-The_Rocks_Walking_Tours-Sydney_New_South_Wales.html

Outline

1. Motivations and Research Objectives
2. Data and Methodology
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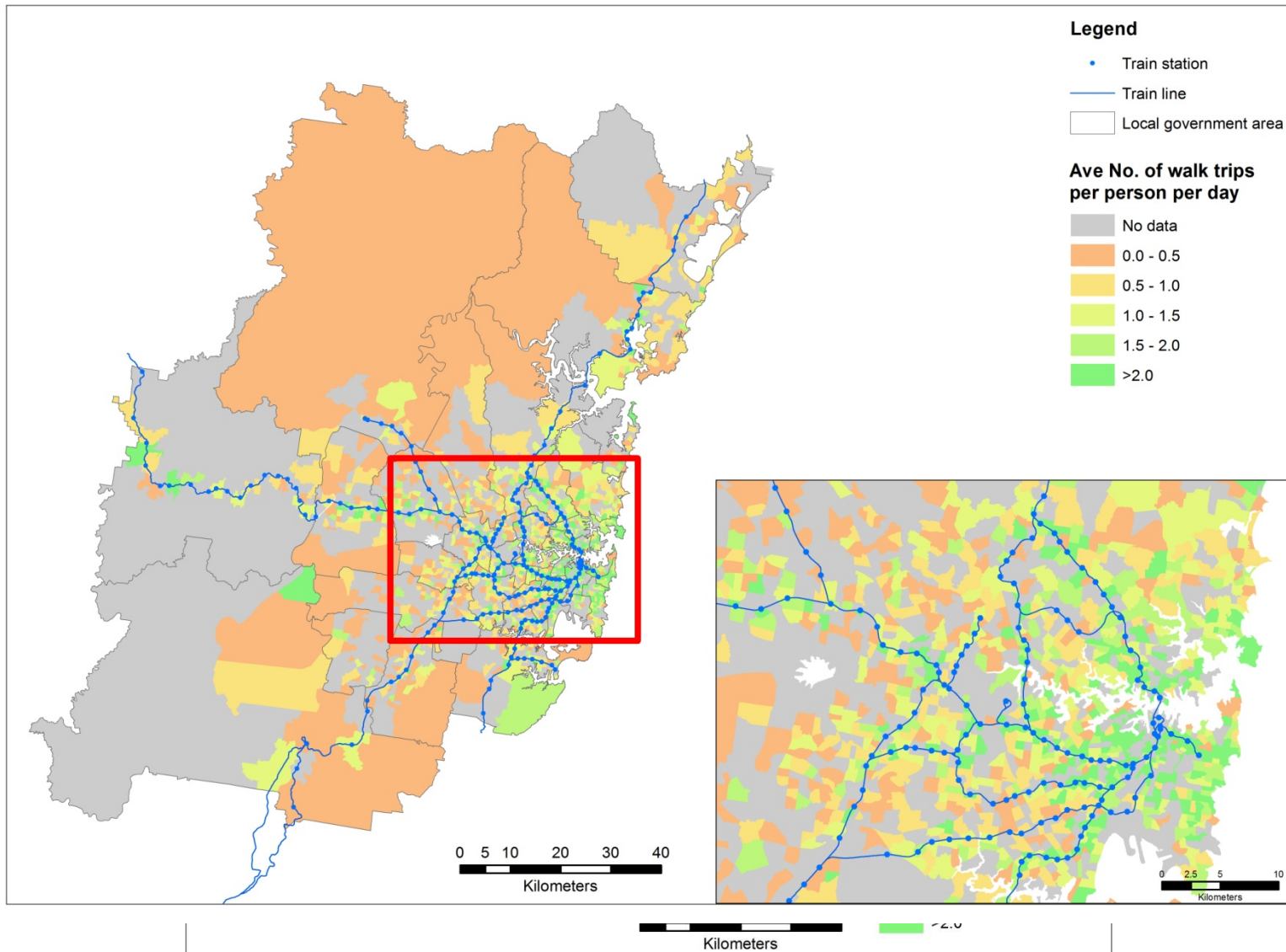
Motivations and Research Objectives

- How far do people walk to public transport?
- How far do Sydneysiders walk ?
 - To public transport
 - To other activities
 - In total
- What would be the improvement in meeting physical activity targets if short trips were converted to walking?
 - Which short trips and by whom
- What are the determinants of these walking trips?
 - To provide appropriate public health advice

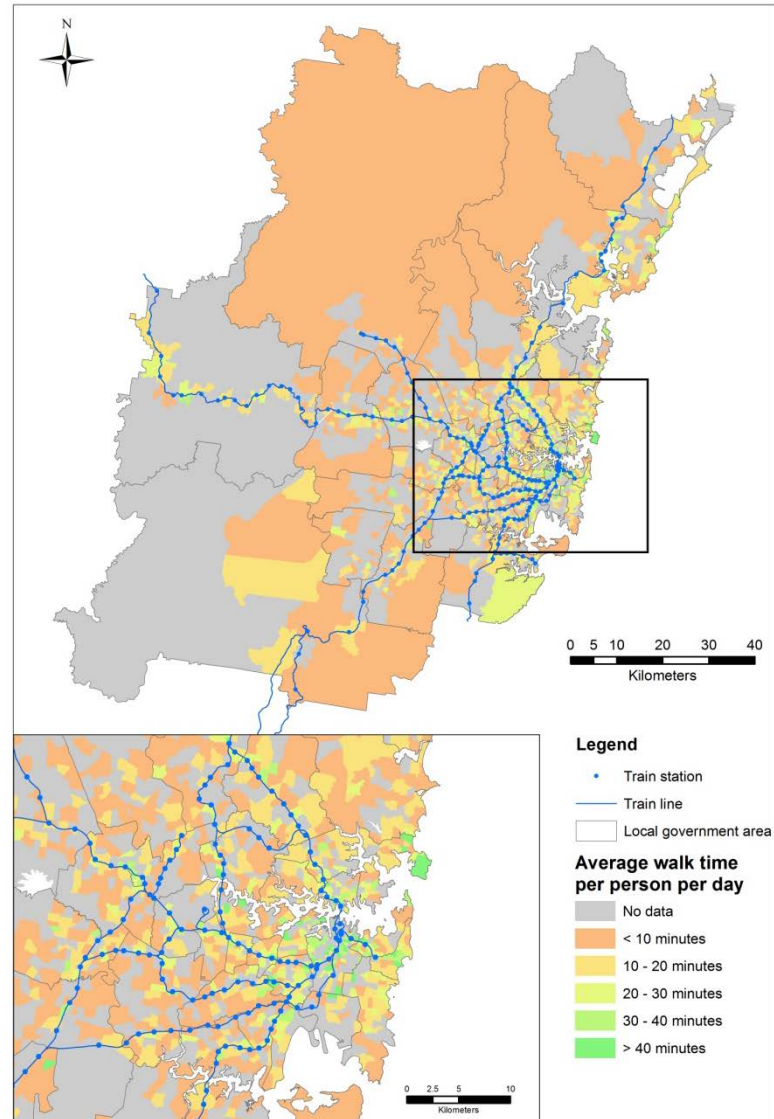
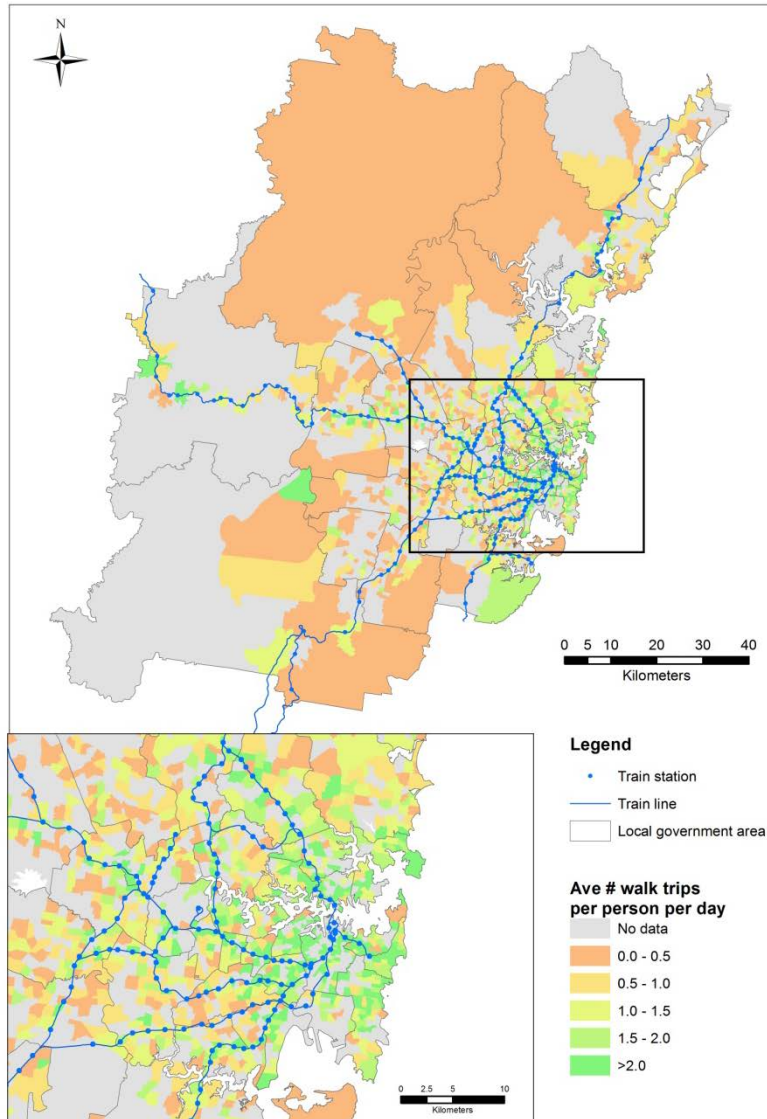
Data and Analysing Methods

- *Sydney Household Travel Survey (2007/08 – 2009/10)*
 - 24-h travel diary for all household members
 - Supplemented with road network data (i.e., skim matrices) and GIS layers
- *Trip-based and tour-based analysis*
 - How much do Sydneysiders walk in terms of trip and time?
 - How much more people would be achieving the recommended physical activity if they walk instead of using motorised modes for walkable trip segments?
- *Modelling analysis*
 - What are the factors that influence the incidence of walking?
 - What are the main drivers of walking time?

Walk trips per person per day by residential location

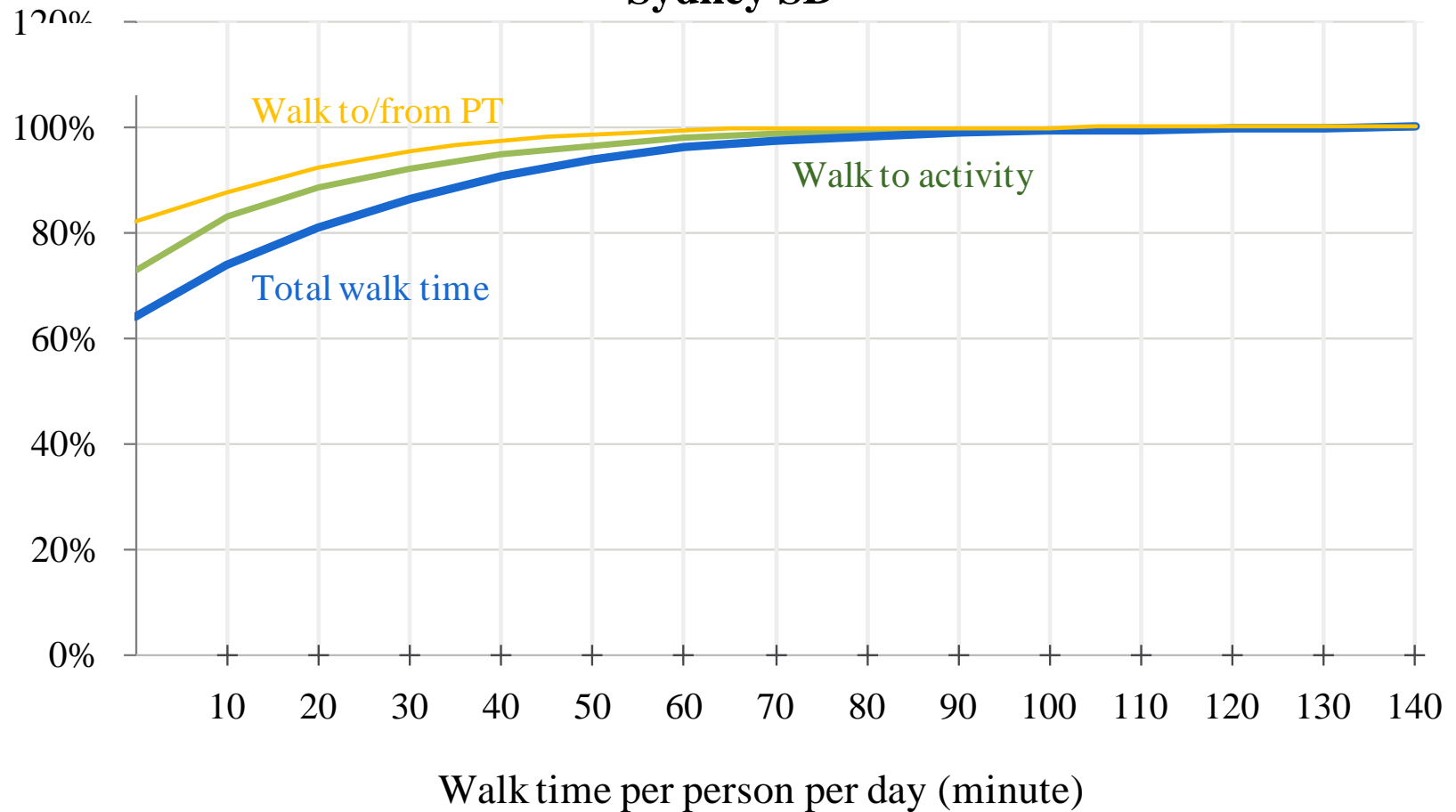


Average Walking per person per day: Trips vs. Time

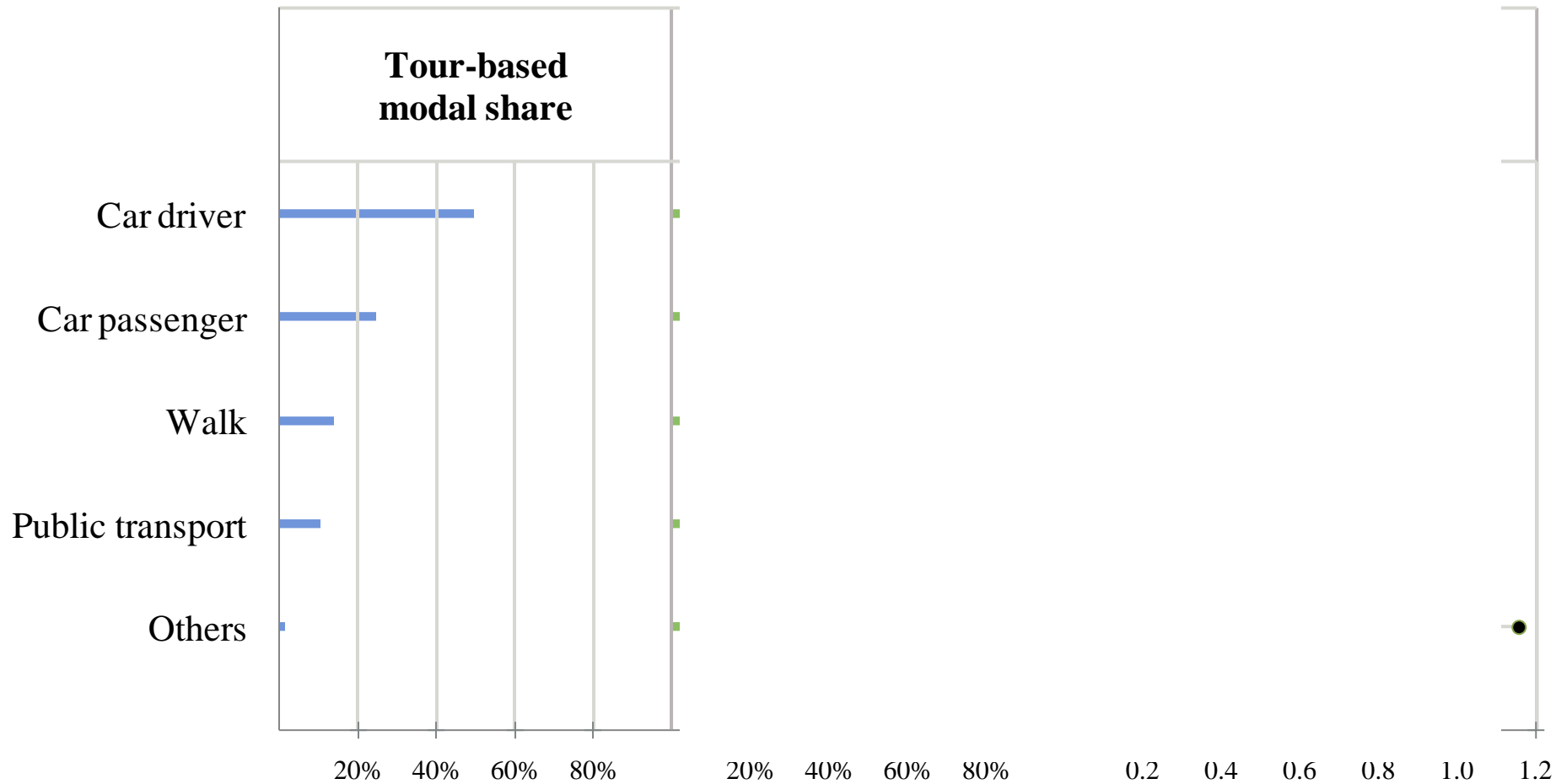


How much do Sydneysiders walk?

Cumulative distribution of walk time per person per day, Sydney SD

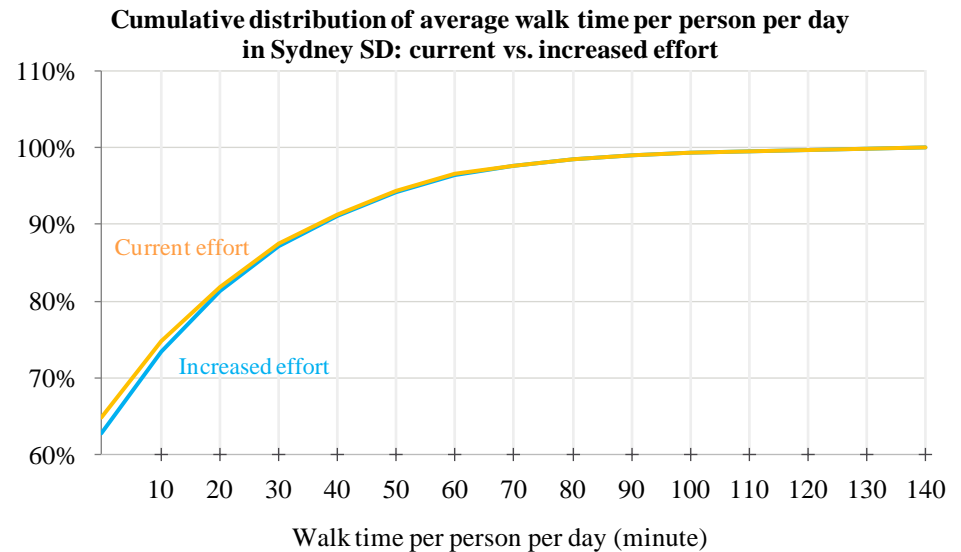
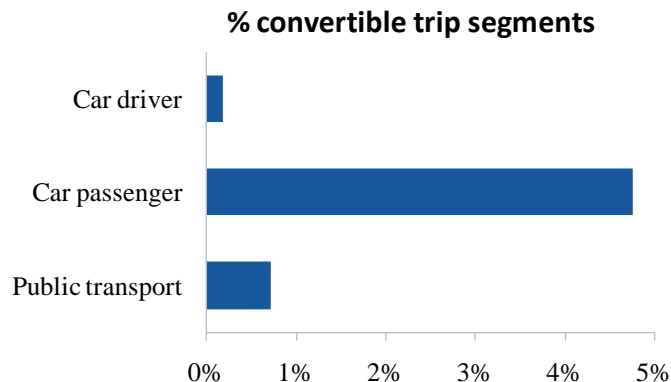


Why Sydneysiders walk very little?



Can we increase walking by converting trips?

- What does it mean to have a **convertible trip segment**?:
- Main mode is PT
 - Motorised trip segment that are within a walkable distance of 800 meters
 - Not a connecting trip segment (PT to PT)
- Main mode is Car
 - Motorised trip segment $\leq 800\text{m}$
 - If car driver, must has an anchor



Modelling walking time

- **Double Hurdle Model:** 2-stage decision process (i.e., hurdle)
- Whether or not a person walks on an observed day; and
- If walk, how long they walks
- As a mathematical expression:
 - Binary probit model governing the walking decision ($d = 1$ or $d = 0$)

$$d_i^* = \alpha' z_i + v_i, v_i \sim N[0,1]$$

$$d_i = 1 \text{ if } d_i^* > 0$$

- Regression model determining the walking time

$$y_i^* = \beta' x_i + \varepsilon_i, \varepsilon_i \sim N[0, \sigma_i]; \begin{cases} y_i = y_i^* & \text{if } d_i^* > 0 \text{ and } y_i^* > 0 \\ y_i = 0 & \text{otherwise} \end{cases}$$

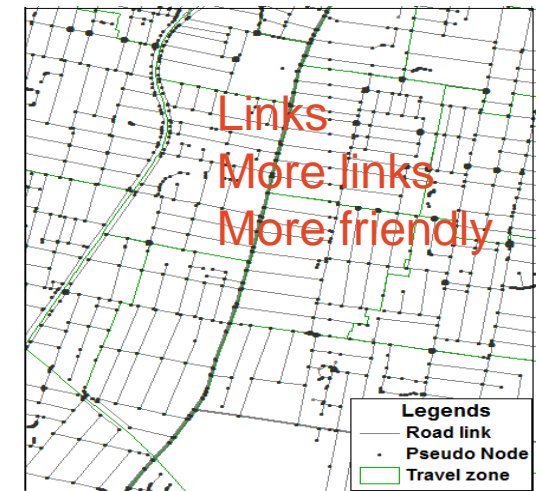
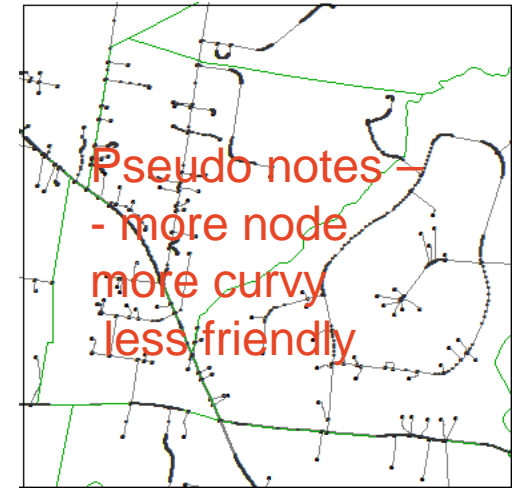
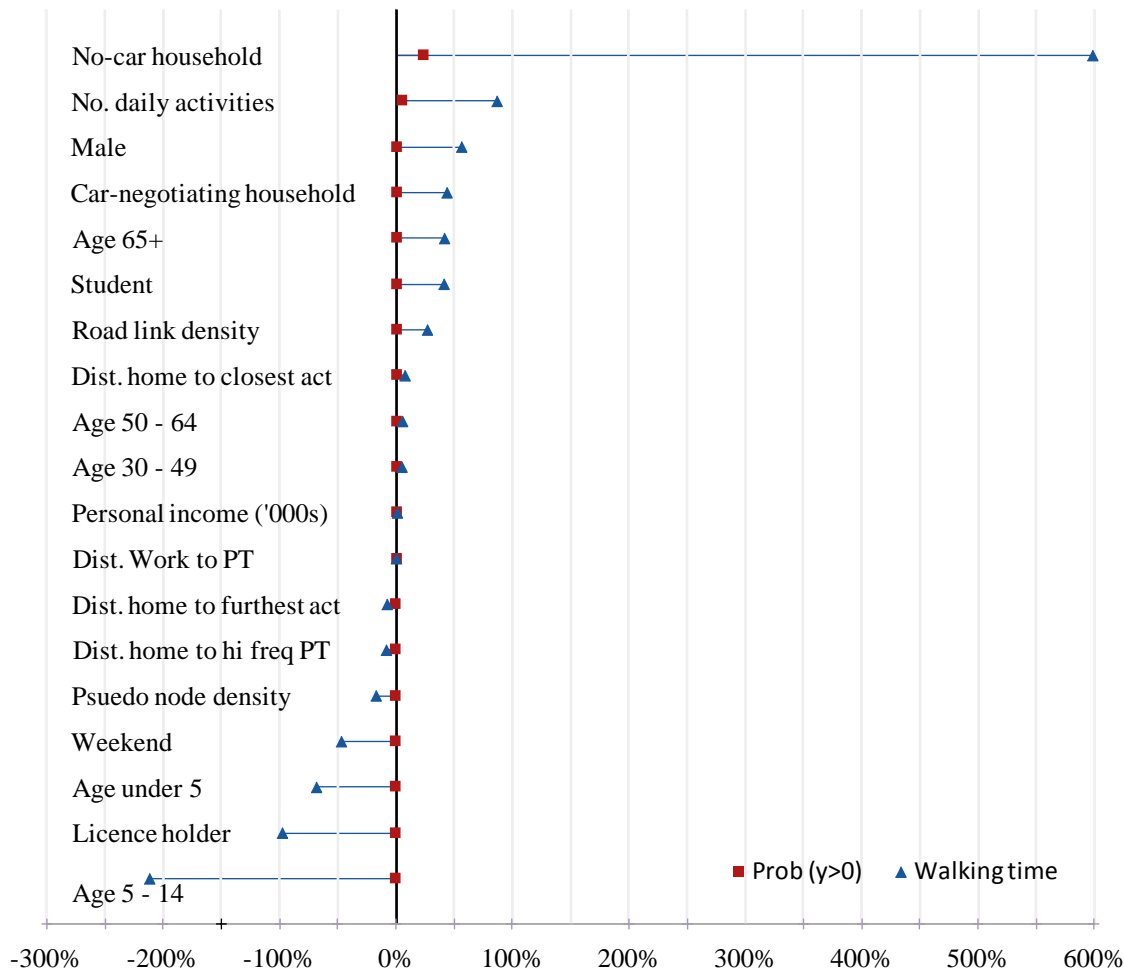
- The model allows for non-normality and heteroscedasticity of the error terms

Modelling Results

	Walk or not (d)	Walking time (y)
No. daily activities	+++	
Distance from home to closest activity (km)	+++	
No-car household	+++	+++
Car-negotiating household		+++
Personal income		+++
Road link density at residential place ('000s/km2)		+++
Pseudo node density at residential place ('000s/km2)		+++
Weekend		---
Licence holder		---
Age under 5 years old		--
Age 5 – 14		---
Distance from home to closest high freq. PT stop		---
Distance from home to furthest activity (km)	---	
Constant	---	+++

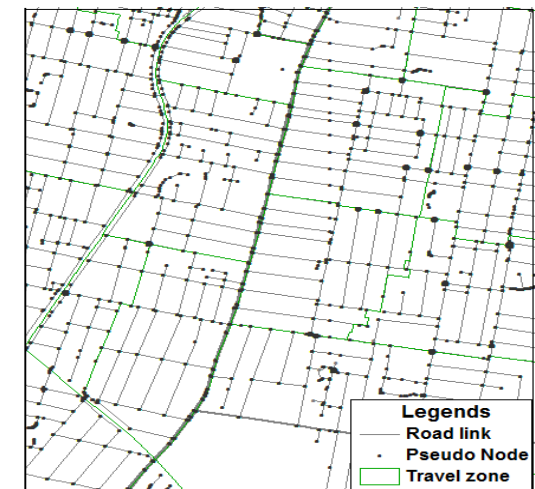
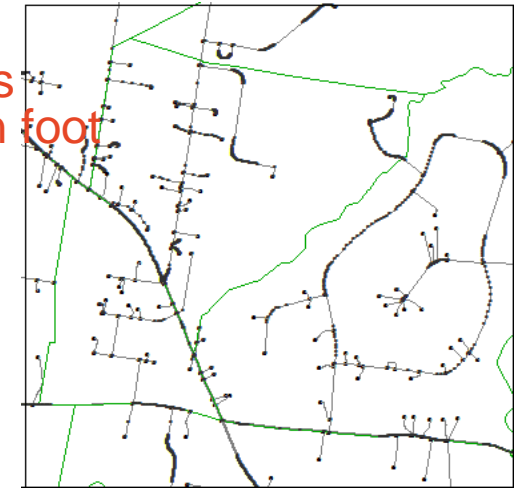
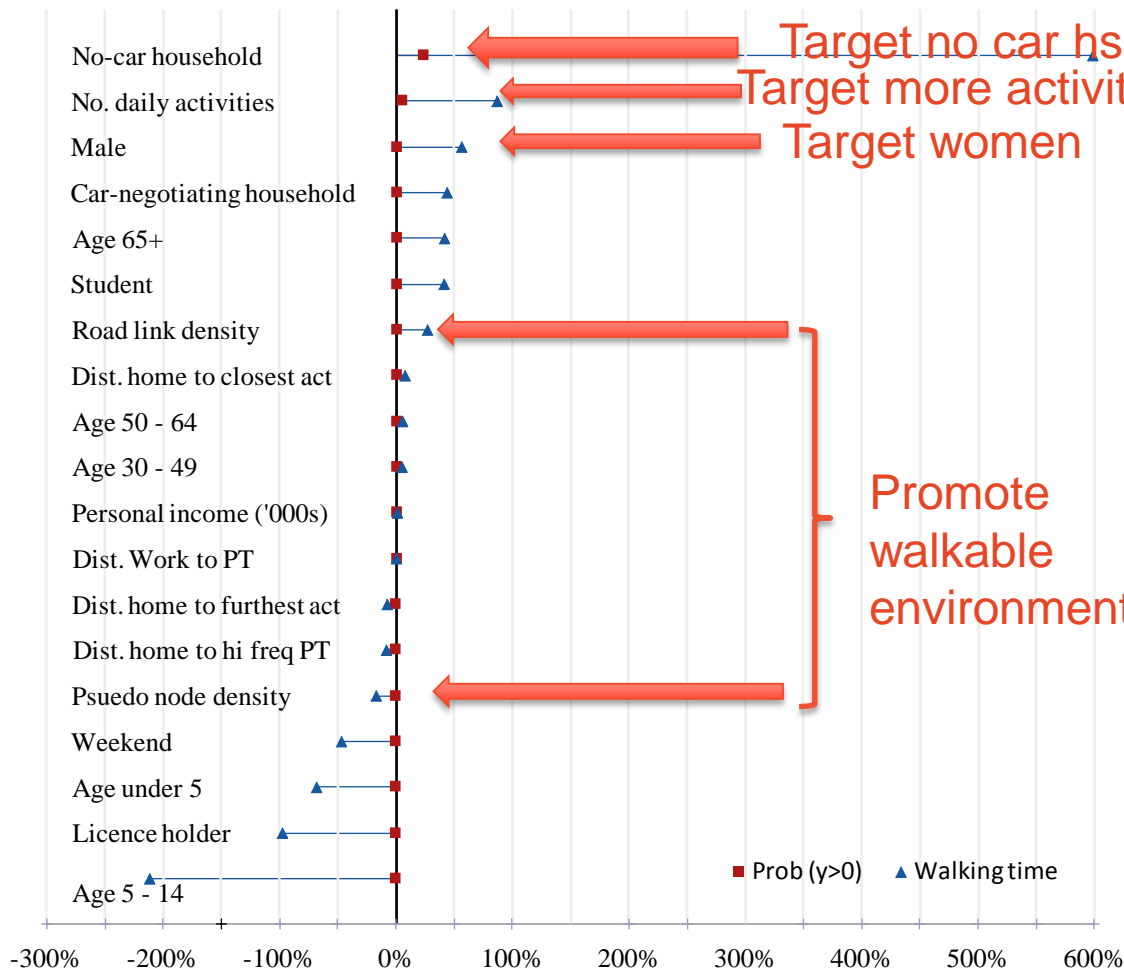
Modelling Results – Partial Effects

Average partial effects on probability of walking and expected walking time



Modelling Results – Using the Partial Effects to target messages

Average partial effects on probability of walking and expected walking time



Conclusions

- If walking were the only physical activity in a typical day, a large proportion of Sydneysiders do not meet advisory physical activity targets
- Walking to access activities contributes more to total walking time than walking to/from motorised modes
- “Covering short distance trips on foot” may not be as good public health message as “doing more activities on foot”
- Walkable environments does appear to associate with longer walking time