

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

Walk21

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Sydney

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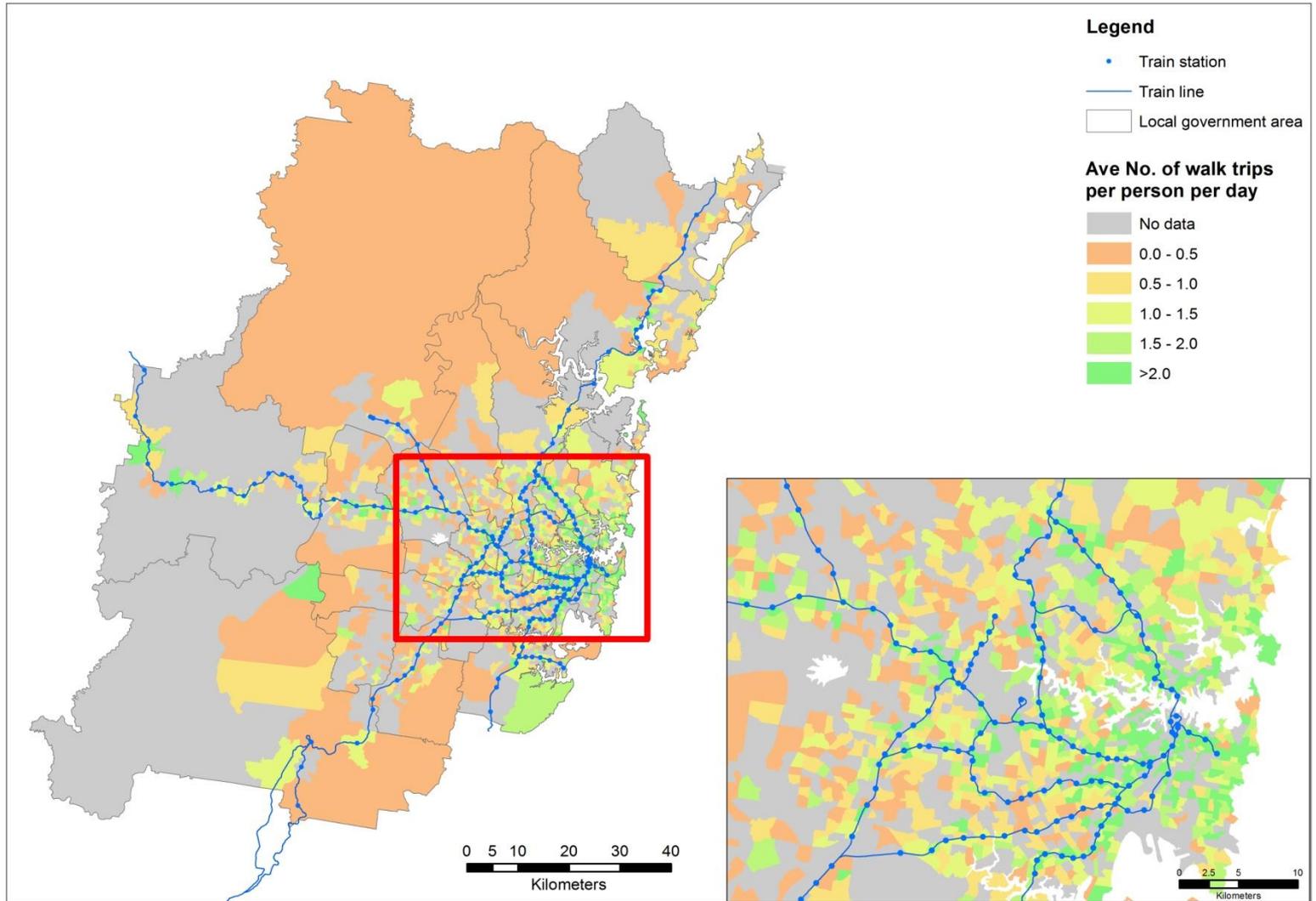
Motivations and Research Objectives

- › 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

- › *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?

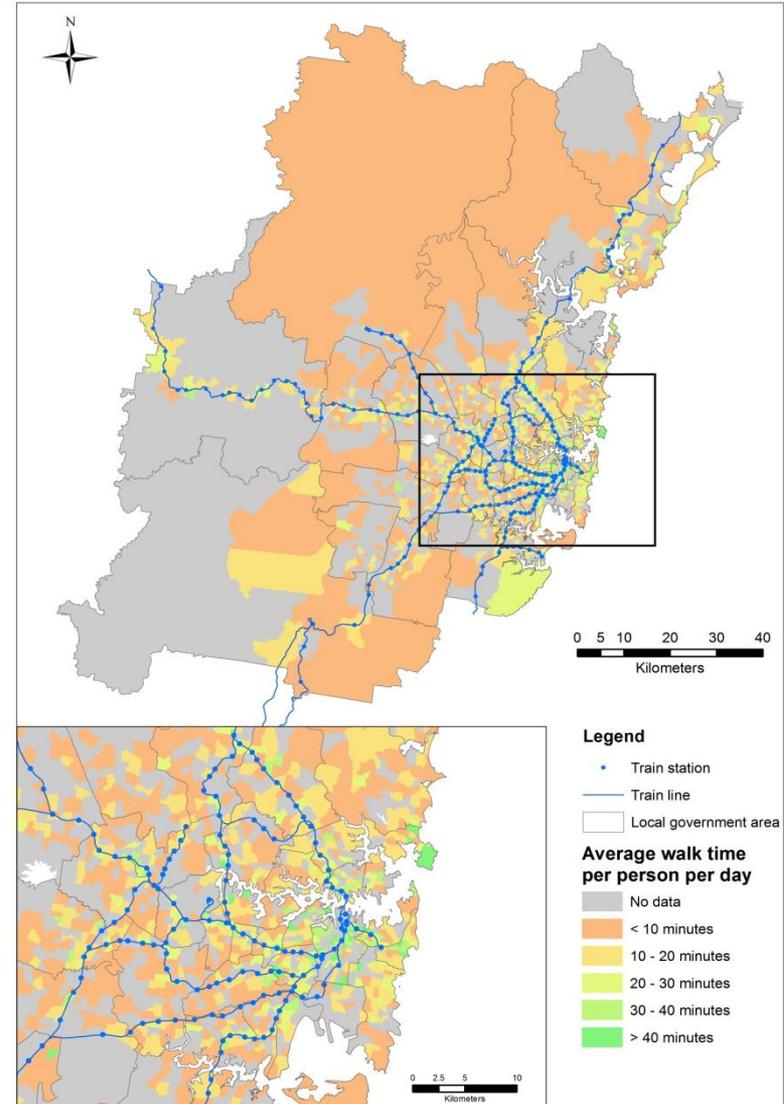
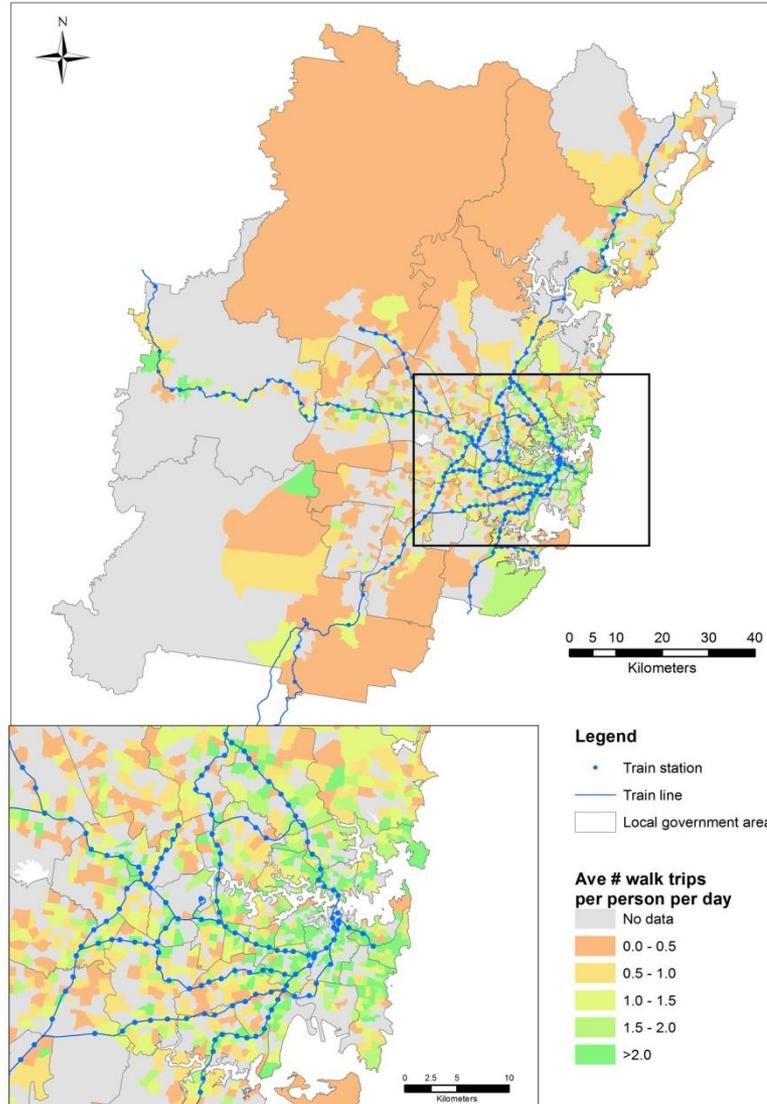


Walk trips per person per day by residential location



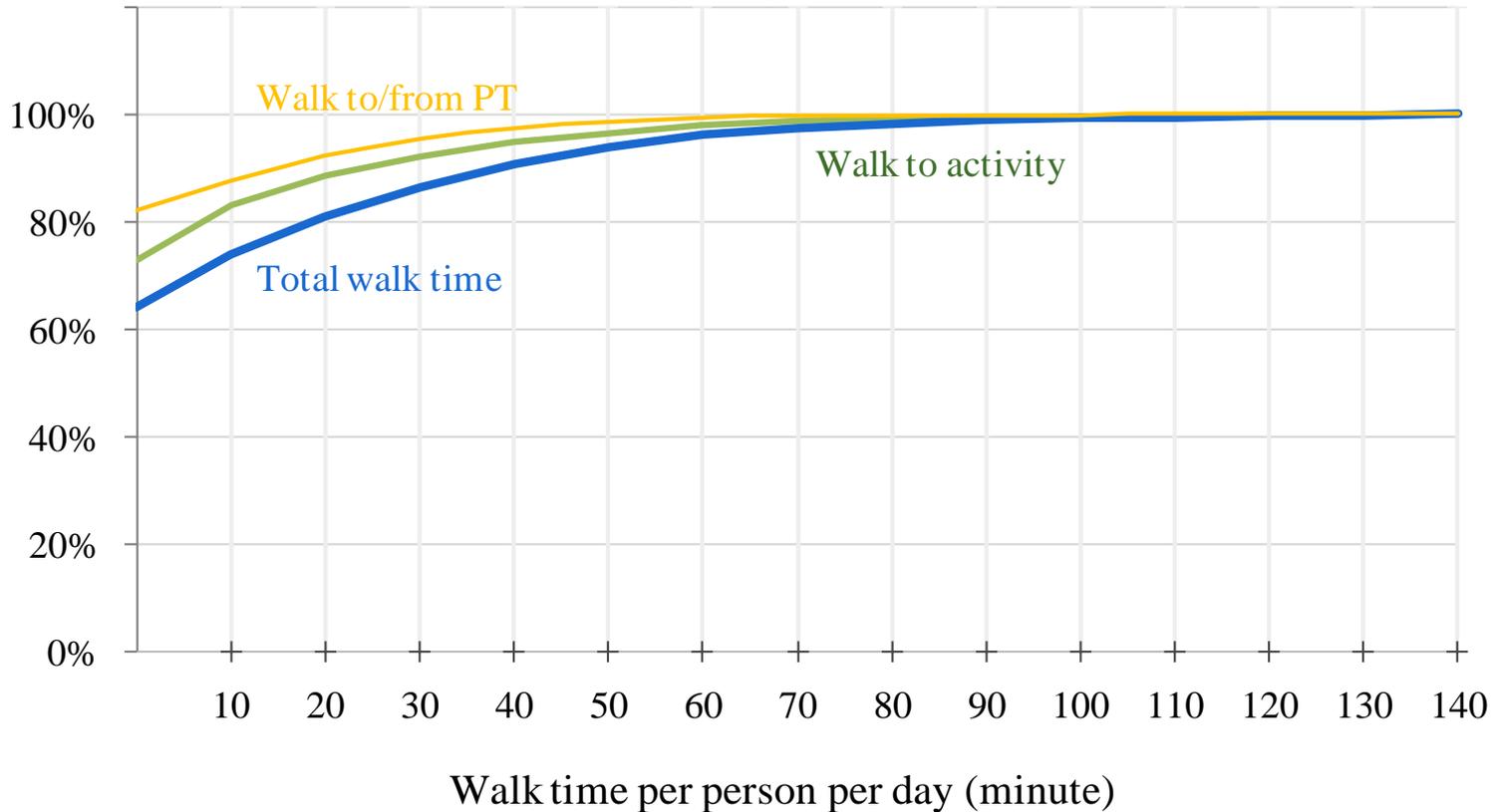


Average Walking per person per day: Trips vs. Time

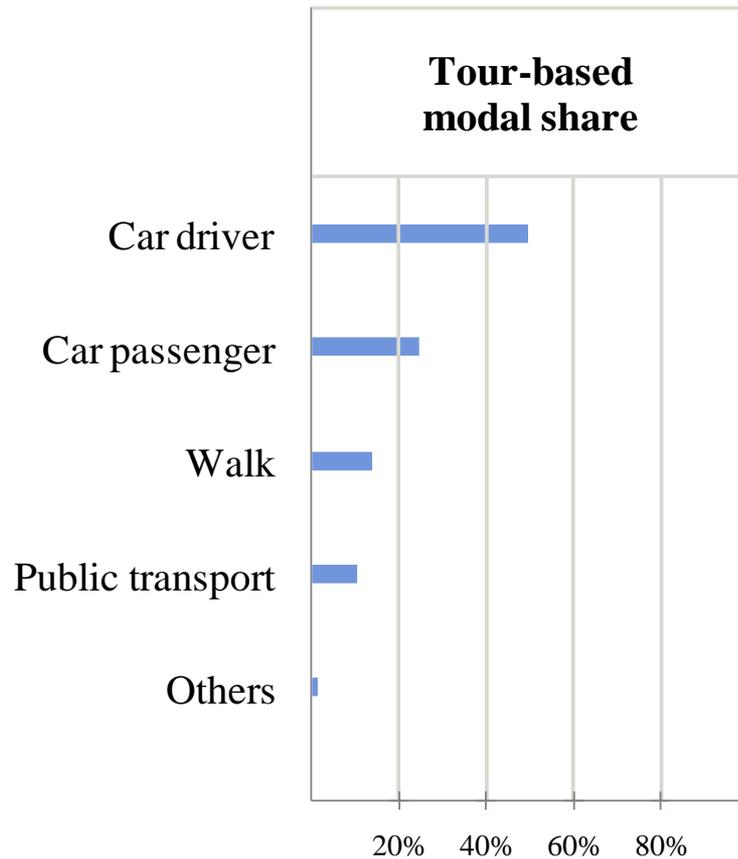


How much do Sydneysiders walk?

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



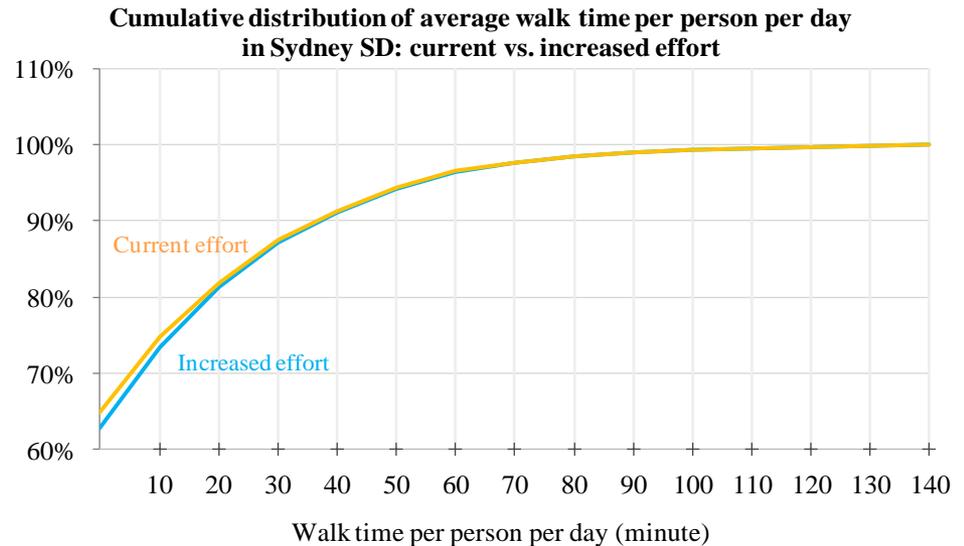
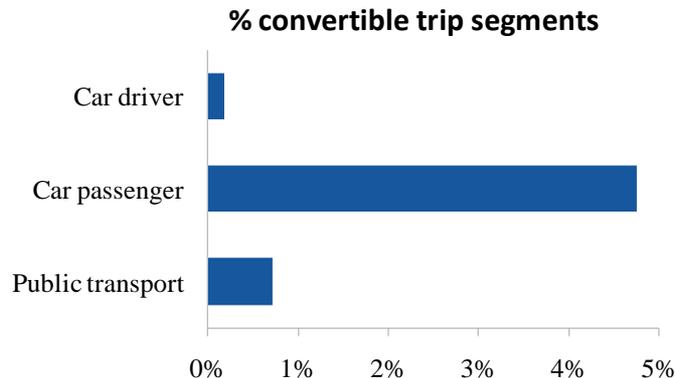
Why Sydneysiders walk very little?



Can we increase walking by converting trips?

Convertible trip segment definition:

- › 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 point



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

› In mathematic expression:

- Binary probit model governing the walking decision ($d = 1$ or $d = 0$)

$$d_i^* = \boldsymbol{\alpha}' \mathbf{z}_i + v_i, v_i \sim N[0,1]$$

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

- Regression model determining the walking time

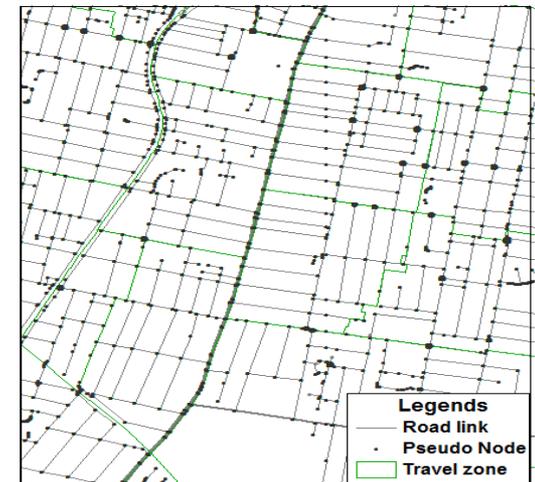
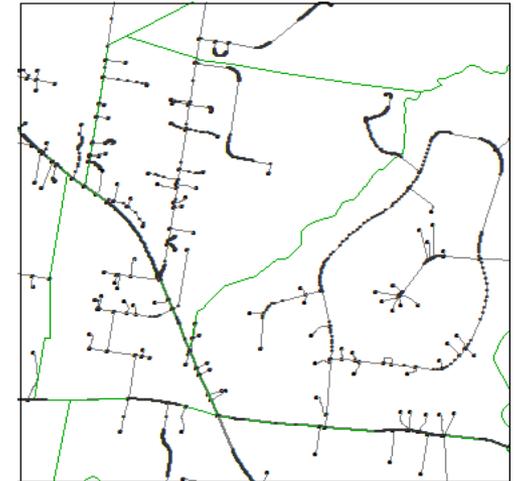
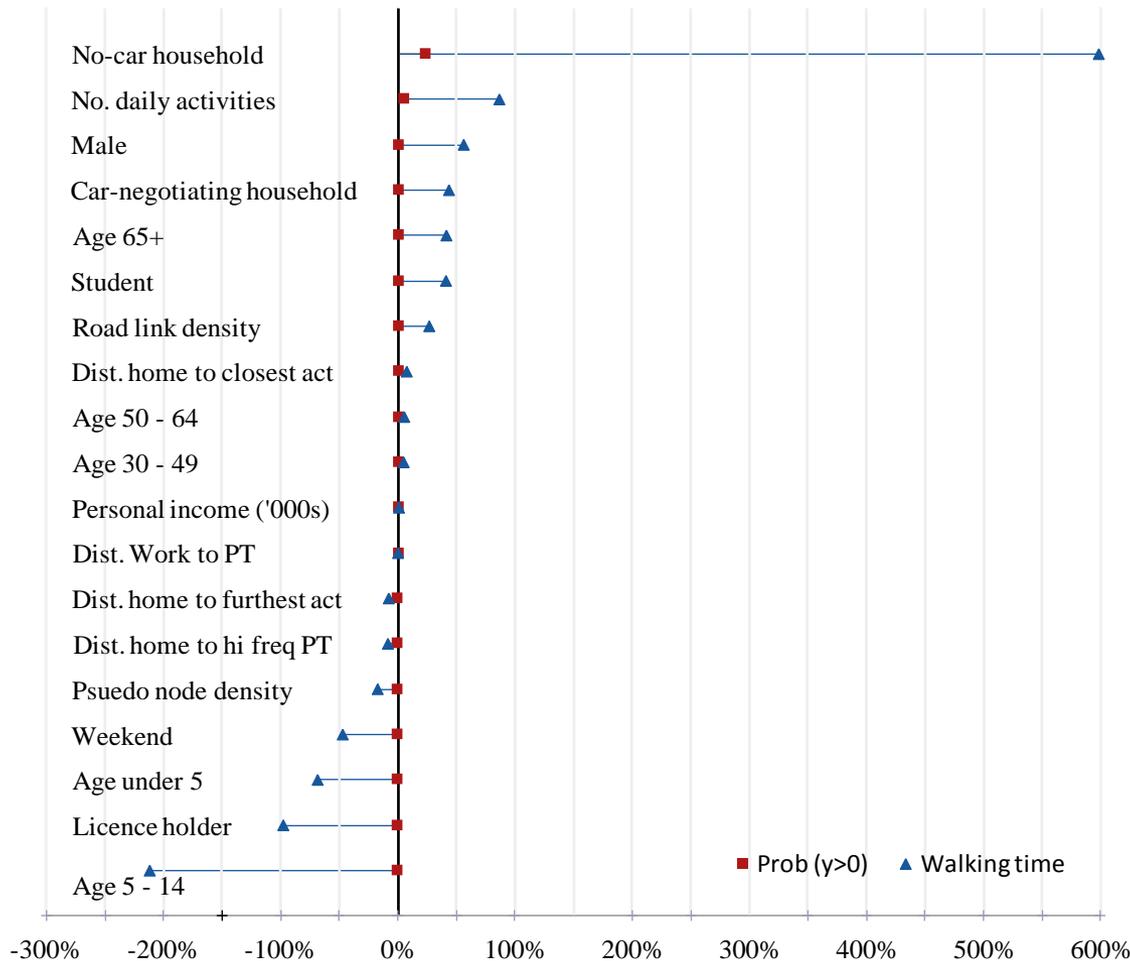
$$y_i^* = \boldsymbol{\beta}' \mathbf{x}_i + \varepsilon_i, \varepsilon_i \sim N[0, \sigma_i]; \begin{cases} y_i = y_i^* & \text{if } d_i^* > 0 \text{ and } y_i^* > 0 \\ y_i = 0 & \text{otherwise} \end{cases}$$

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

	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/km ²)		+++
Pseudo node density at residential place ('000s/km ²)		+++
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



- › 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 a good public health message but “doing more activities on foots” may be
- › Friendly walking environment does associate with longer walking time