

## Measuring the Built Environment using GIS

### Walkability index<sup>1</sup>

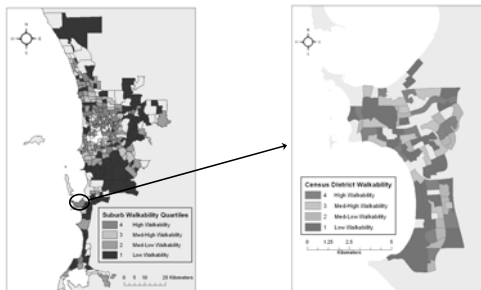
- Street Connectivity
- Residential Density
- Land Use – Diversity and Intensity
- Retail Floor Area Ratio

<sup>1</sup>Based on index developed by Larry Frank

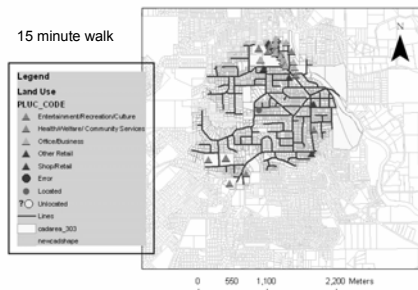
## Overall project aim

- To assess neighbourhood walkability at different scales (suburb, CCD and 15 minute walk level);
- To study the impact of neighbourhood scale on different types of walking

## Neighbourhood scale (Learnihan, 2007)



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## Use of Geographic Information System to assess the impact of 'neighbourhood' scale on walking

Data being discussed are unpublished.

Vincent Learnihan

Supervisors: Kimberly Van Niel; Billie Giles-Corti

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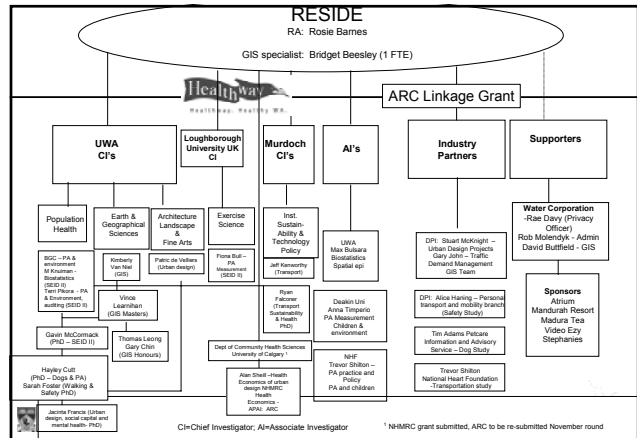
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## Urban Design and Safety

Safety and Walking Study  
Sarah Foster

Supervisors: Billie Giles-Corti; Matthew Knuiman



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## Study aim

- To investigate the relationship between *urban design factors* related to *perceived safety* and *walking* in the local neighbourhood



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## Background

- 'Neighbourhood safety' can refer to traffic, unattended dogs, street lighting, infrastructure condition, disorder and crime
- Measurements of subjective crime-related safety focus on judgments about crime rather than emotional responses to crime
- Possible responses to fear of crime: constrained or protective behaviour

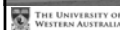


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## Urban design features

- Liveable Neighbourhoods aim to promote safety through activity and surveillance
- Natural surveillance
  - House design (setbacks, porches/verandahs, back alleys, fencing, landscaping)
  - Neighbourhood design (mixed density, houses overlooking POS)
  - Street lighting
  - Walkable neighbourhoods – more surveillance from pedestrian traffic?



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## Neighbourhood condition

- Physical incivilities (e.g. graffiti, litter, vandalism)
  - Associated with increased crime, fear of crime, perceived crime
- 'Suburban incivilities' (e.g. house, garden, lawn maintenance)
  - Indicates place attachment and territoriality



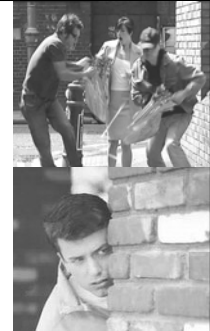
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## Perceptions

- Questionnaire sent to RESIDE participants
  - Housing design and street surveillance
  - Fear of crime
  - Perceived risk from crime,
  - Local problems, disorder and crime
  - Experiences of victimization
  - Protective and constrained behaviour
  - Collective efficacy



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## Environmental data

- Objective data
  - RESIDE POST data: surveillance from houses, incivilities, lighting
  - Street audit for surveillance, incivilities, personalisation, maintenance
  - Police crime statistics / newspaper content analysis
  - Street lighting



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## Developed a *Crime Prevention Through Environmental Design (CPTED)* index

- Houses with good visibility
- Verandah, porch or balcony
- Low walls, fences, hedges or borders
- No unkempt gardens
- No unkempt front lawns
- No vacant lots



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## Concluding remarks



What impact do these features have on actual crime and local walking? Stay tuned...



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## Improving Mental Health – what role for neighbourhood design?

Jacinta Francis  
Supervisors: Billie Giles-Corti; Lisa Wood

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## The built environment and mental health


- Directly
- Indirectly  
by altering psychosocial processes with known mental health consequences



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## Psychosocial processes


- Social networks
- Social support
- Sense of community
- Sense of place



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## Aim


- To investigate the relationship between the presence, use and design of public places and psychosocial outcomes in residents of new Estates in the Perth metropolitan area.



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## Methodology


- Focus groups
- Survey of RESIDE participants
- Objective park data
- Content analysis of newspapers




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## Hypothesis

- Public places that are easy to access, frequently utilized and well designed → positive psychosocial outcomes → better mental health.






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## Increasing physical activity through dog walking.



### What role for neighbourhood design?




**Hayley Cutt**  
Supervisors: Billie Giles-Corti; Matthew Knuiiman

## Background

- ✂ Level of dog ownership high
- ✂ Health benefits of pet ownership
- ✂ Dog owner vs non-owner walking levels
- ✂ Social environment and dog walking
- ✂ Physical environment and dog walking?
- ✂ RESIDE baseline survey data (n=1813; 44% dog owners)







### Odds of sufficient PA according to dog ownership and dog walking frequency (Cutt et al, Am J Public Health 2008)

	% active at recommended level	Odds Ratio	95% CI
Non-owner	54.1	1.00	Reference
<b>Dog owner</b>	<b>61.2</b>	<b>1.68*</b>	<b>1.26-2.24</b>
0 walks per week with dog	43.6	0.87	0.56-1.35
1-4 walks per week with dog	57.1	1.64*	1.16-2.31
≥5 walks per week with dog	88.1	6.95*	3.41-14.15




Adjusted for gender, age, country of origin, education, occupation, mean age of children living at home <18 years, type of residence.


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## The physical environment & dog walking










### Correlates of regular dog walking

Cutt, H., Giles-Corti, B. & Knuiiman, M. *International Journal of Behavioral Nutrition and Physical Activity* 2008, 5:17

Characteristic	n	OR <sup>1</sup>	CI	p value
<b>Perceived access to POS with dog-supportive features</b>				
Poor/average	446	1.00		
Good	36	1.42	0.69-2.91	0.341
<b>Park within 1.6km of home with dog supportive features</b>				
No	407	1.00		
Yes	76	2.00	1.16-3.42	0.012

<sup>1</sup>Adjusted for demographic, intra-personal, social environmental, and dog-specific factors

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## If we build it, they will come

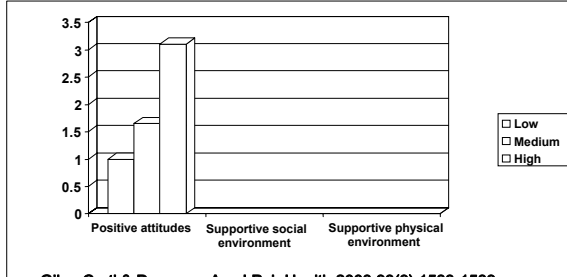


## If we build it, *will* they come?



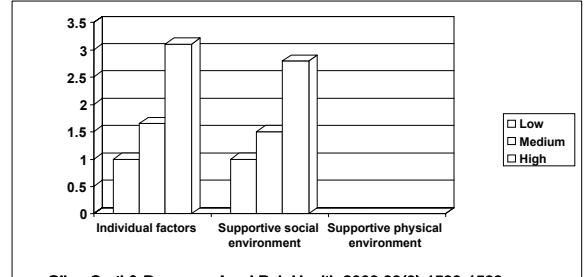
Any evidence for targeting people and places?

**Relative influence of factors associated with walking as recommended (adjusted for demographic factors)**



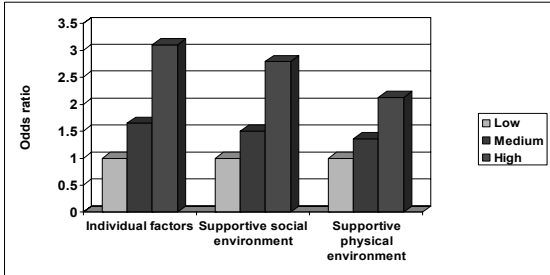
Giles-Corti & Donovan, Am J Pub Health 2003;93(9):1583-1589

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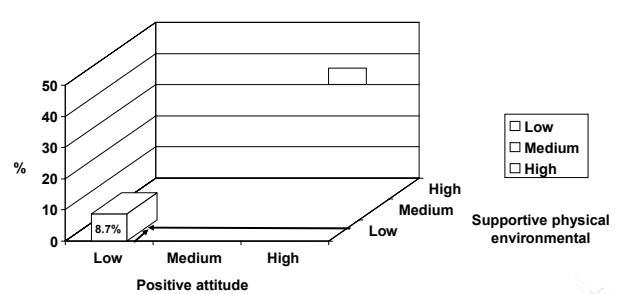
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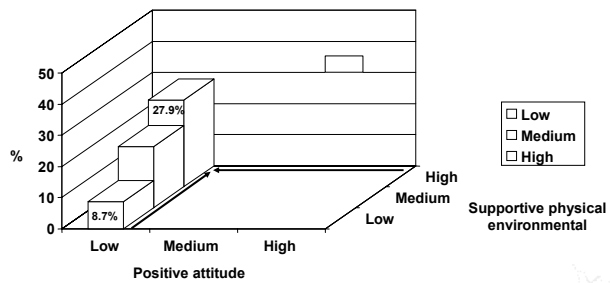
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Giles-Corti JSAMS 2006 (9):357-366.



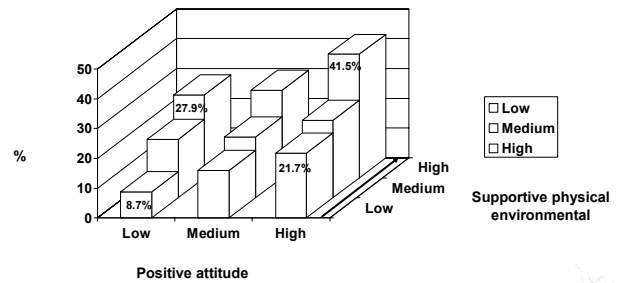
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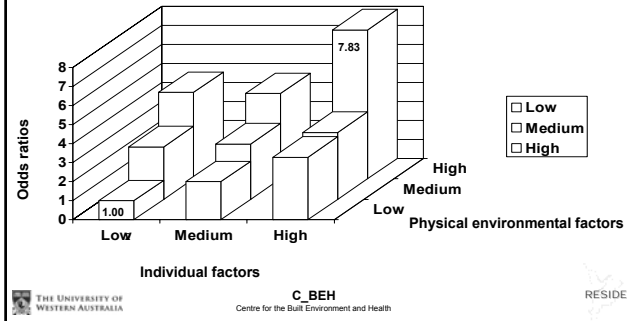
**Prevalence of sufficient walking by joint influence of individual and environmental factors (5+ times/week ≥150 minutes/day)**

Giles-Corti JSAMS 2006 (9):357-366.



### Odds of walking as recommended by joint influence individual & physical environmental factors<sup>1</sup>

<sup>1</sup> (Adjusted for age, sex, children under 18 at home, education, household income, work outside home, SES of area of residence, social environmental factors). <sup>2</sup>Reference category.



### Where to from here?

### Centre for the Built Environment and Health – opened November 2007



### Centre for the Built Environment and Health

The Centre aims to do research that is:

- Policy-relevant
- Focussed on the built environment and
  - walking, cycling, transportation choices
  - Obesity
  - Positive mental health
  - Child development
  - Other health outcomes
- Interdisciplinary
- Excellent

Funded by:



### Centre Advisory Board

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Multiplex



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Healthway



Mr Jeremy Dawkins  
WAPC



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Mr Charles Johnson  
CEO City of Wanneroo



Mr Trevor Shilton  
Heart Foundation



Ms Margie Tannock  
Minter Ellison

Ms Sue Leivers  
Health Department WA

### Centre Chief Investigators Capacity Building Grant



Mr Greg Martin  
(Chair)



Prof Osvaldo  
Almeida



Professor Rob  
Donovan



Ms Ruth Durack



Professor Matthew  
Knuiman



Dr Kimberly  
Van Niel



Prof Steve  
Zubrick



## Chief Investigators on other projects



Associate Professor Max Bulsara   Prof Fiona Bull   Dr Liz Geelhoed   Dr Terri Pikora   Dr Anna Timperio

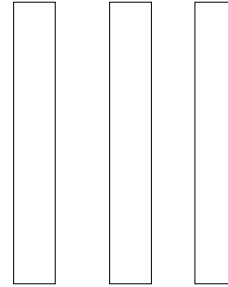


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## Centre for the Built Environment and Health\* Research Program

Children   Adults   Older Adults



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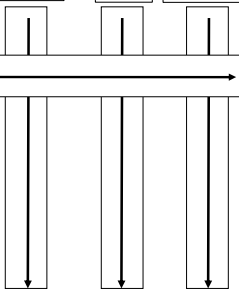


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Children   Adults   Older Adults

Methods

Consumer input →



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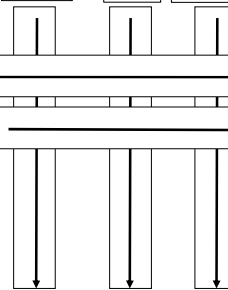
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Children   Adults   Older Adults

Methods

Consumer input →

Statistical methods →



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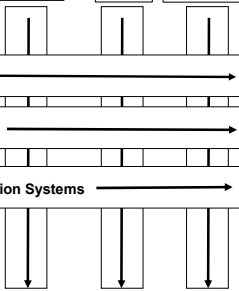
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Methods

Consumer input →

Statistical methods →

Geographic Information Systems →



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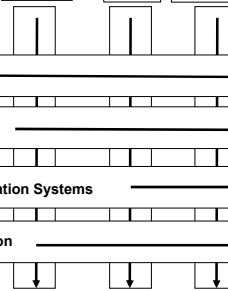
Methods

Consumer input →

Statistical methods →

Geographic Information Systems →

Research Translation →

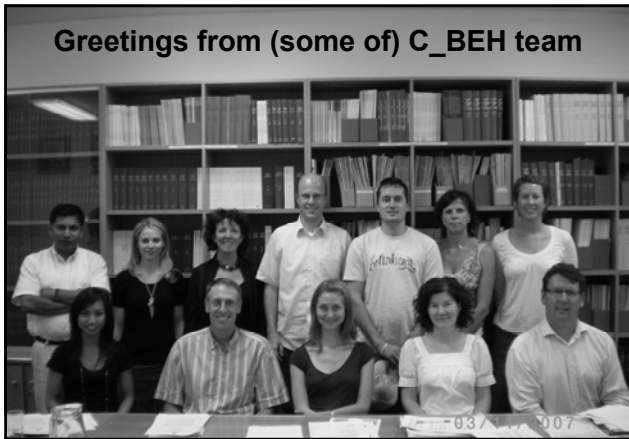
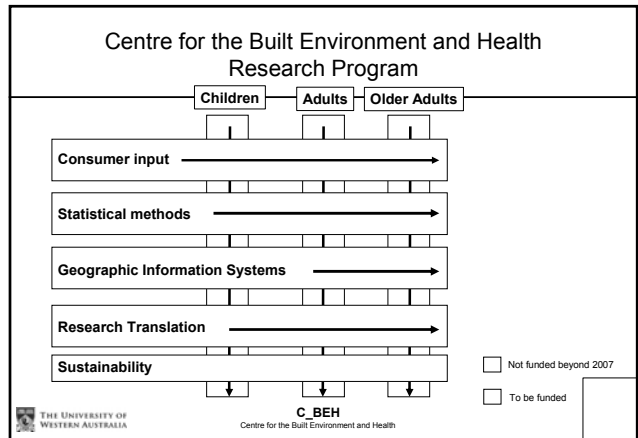
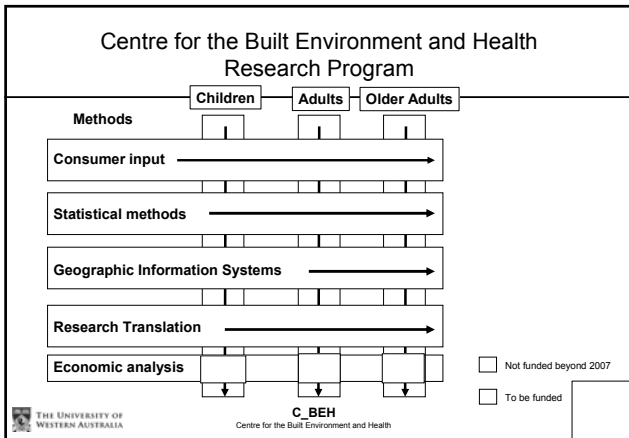


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*Don't worry about the world coming to an end  
today.  
It's already tomorrow in Australia.*

Charles Monroe Schulz

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RESIDE

Thank you for your attention

For more information:

**[Billie.Giles-Corti@uwa.edu.au](mailto:Billie.Giles-Corti@uwa.edu.au)**  
**<http://populationhealth.uwa.edu.au/reside>**

\*Supported by an NHMRC Senior Research Fellowship  
and while in the USA, a Fulbright Senior Scholar Award

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