# Submission into Inquiry into Environmental Design and Public Health

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# Evidence of contribution of natural and built environment on promotion of health and well being

# Overall conclusions of evidence reviews

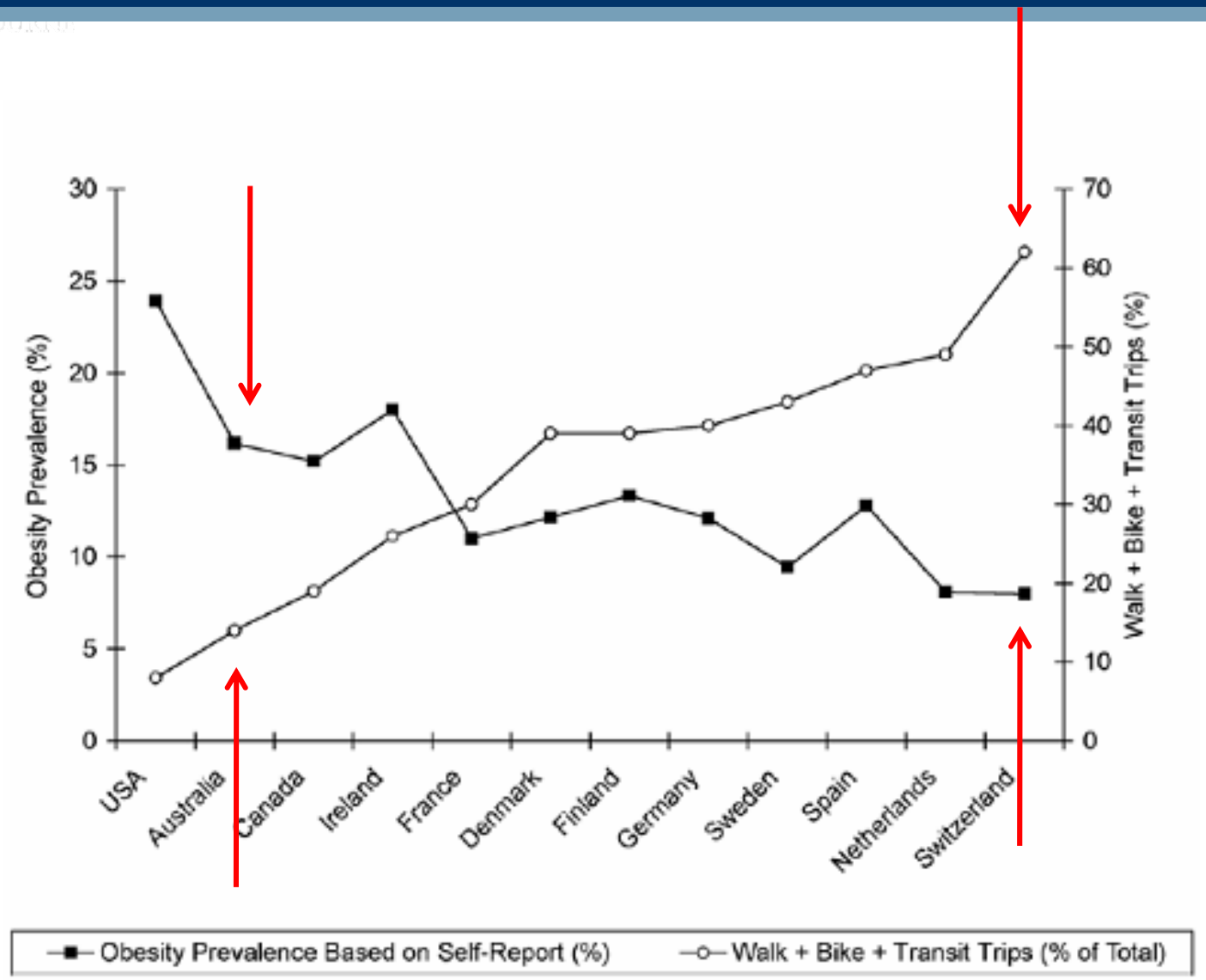
Compared with compact higher density neighborhoods urban sprawl associated with:

- Lower levels of walking
- Fewer people using active modes (walking, cycling and public transport use)
- More vehicle miles driven
- More sedentary behaviour
- Increased levels of obesity

Increased environmental pollution and green house gas emissions

For activities of daily living - decreased *human energy* expenditure and increased *fossil fuel energy* expenditure

# Walking, cycling and public transport trips and obesity




(Basset DR. et al,. 2009. *Journal of Physical Activity and Health.* 5;795-814)

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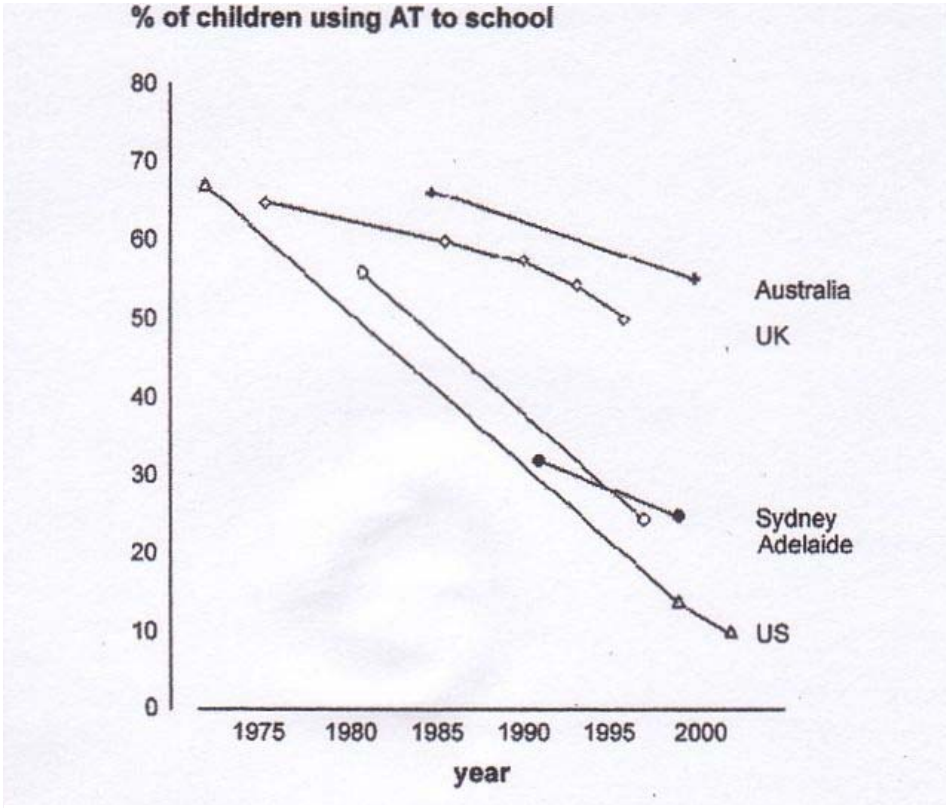
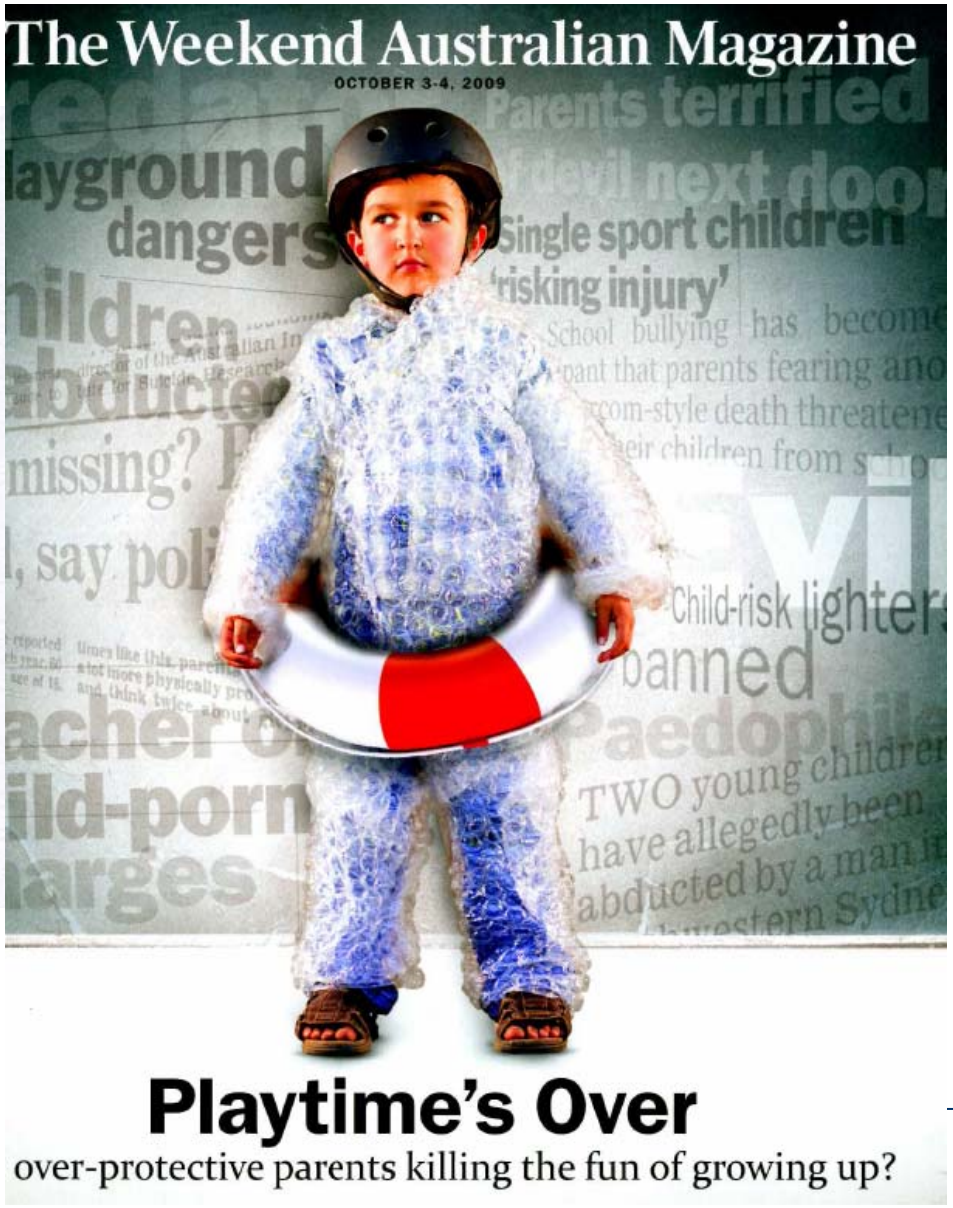
# What's required? Increase in higher density – average 35 houses/hectare - mixed use development supported by public transport

# What's required? Age-friendly planning




Source: Harten & Olds ANZJ Pub Health, 2004:28(2):167-72



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# School site and th… of street connectivity and t…

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Children attending government primary schools in neighborhoods with connected street networks ***and*** busy roads **62% less likely to regularly walk to school**

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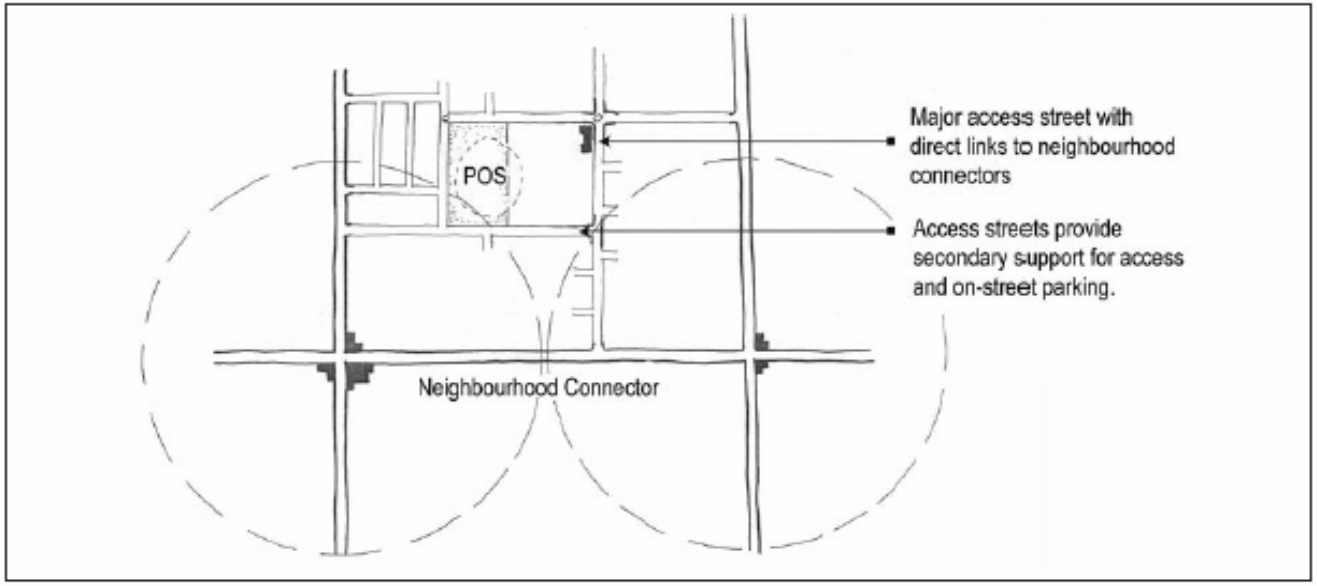
ABSTRACT

The impact of neighborhood walkability (based on street connectivity and traffic exposure) within 2 km of public primary schools on children regularly walking to school was examined. The most ($n=13$) and least walkable ($n=12$) schools were selected using a school-specific 'walkability' index and a cross sectional study undertaken of Year 5, 6 and 7 children ($n=1480$) and consenting parents ($n=1332$). After adjustment, regularly walking to school was higher in children attending schools in high walkable neighborhoods (i.e, high street connectivity and low traffic volume) (Odds ratio (OR) 3.63; 95% Confidence Interval (CI) 2.01–6.56), and less likely in neighborhoods with high connectivity but high traffic volume (OR 0.32; 95% CI 0.22–0.47). Connected street networks provide direct routes to school but when designed for heavy traffic, the potential for children to walk to school is reduced. This highlights the importance of carefully considering school siting and, particularly, street design in school neighborhoods.

# What's required?

- Emphasis on child-friendly planning in precinct structure planning
- Siting schools on the edge of neighbourhoods *and away* from busy roads



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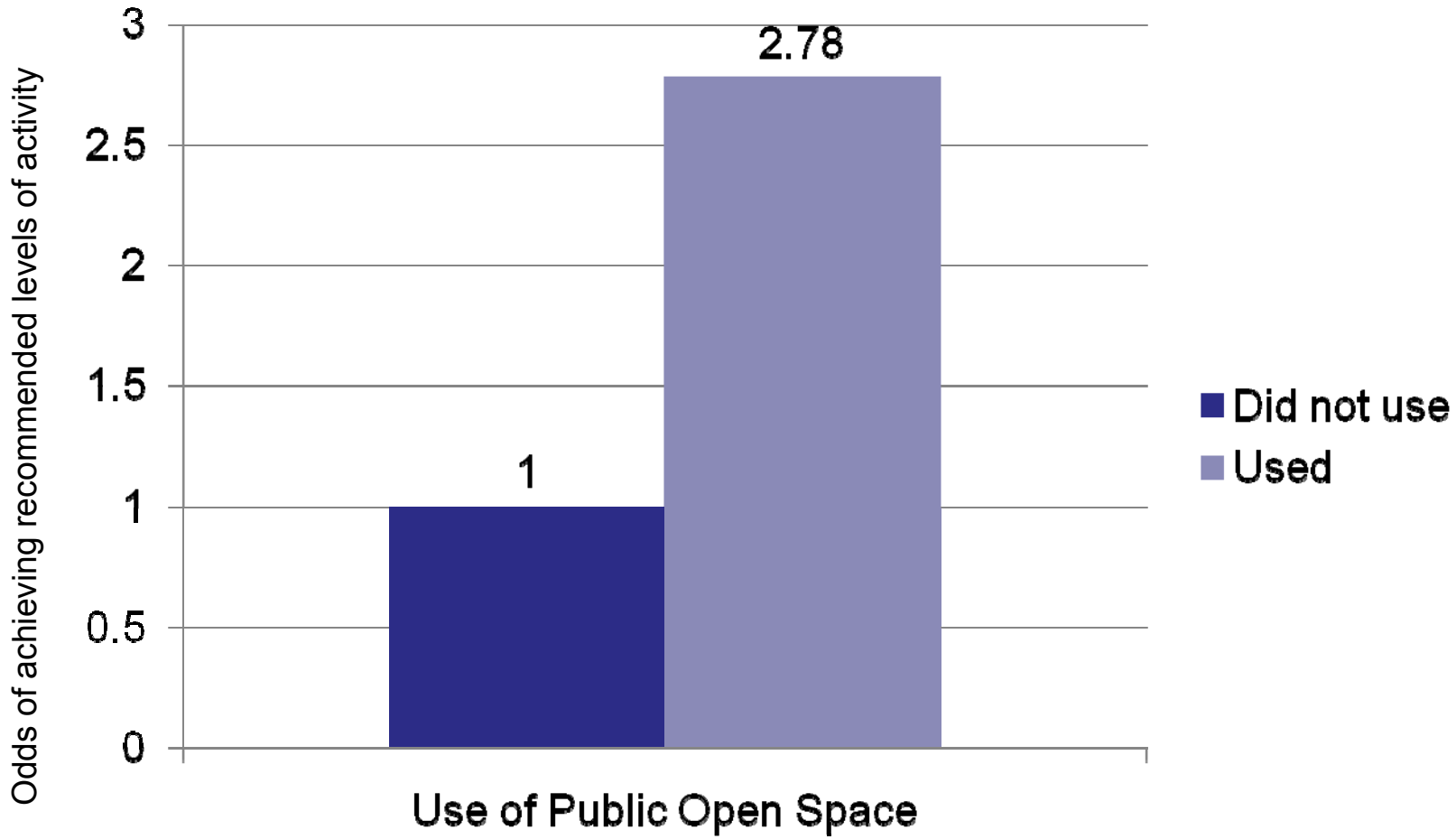
**What's required? For older adults similar considerations required: housing located in walkable neighbourhoods with proximate activities for daily living and reduced traffic exposure**

# Role of public open space in promoting good health – physical activity and mental health




[1]Adjusted for age, sex, number of children under 18 at home, education and SES area residence

# Access to local POS increases children's physical activity

- **Children with good access to nearby parks and parks with facilities are more active out-of-school**
  - Each park within 800m of 6 grade girls homes (n=1556) on average did 17.2 minutes extra non-school moderate-vigorous activity weekly (on average)
  - Girls with 3.5 parks within 1.6 km radius of home did 36.5 extra non-school MVPA minutes/6 days
  - Increased activity associated with access to parks with specific amenities– e.g., running track, walking paths, multi-purpose field, basketball courts (Cohen et al., Pediatrics 2006:118(5):e1381))
  - Girls with ≥ 9 places to go for physical activity did 14% more non-school MVPA than girls with ≤ 4 places (Evenson et al. Obesity 2007:15(20):430)

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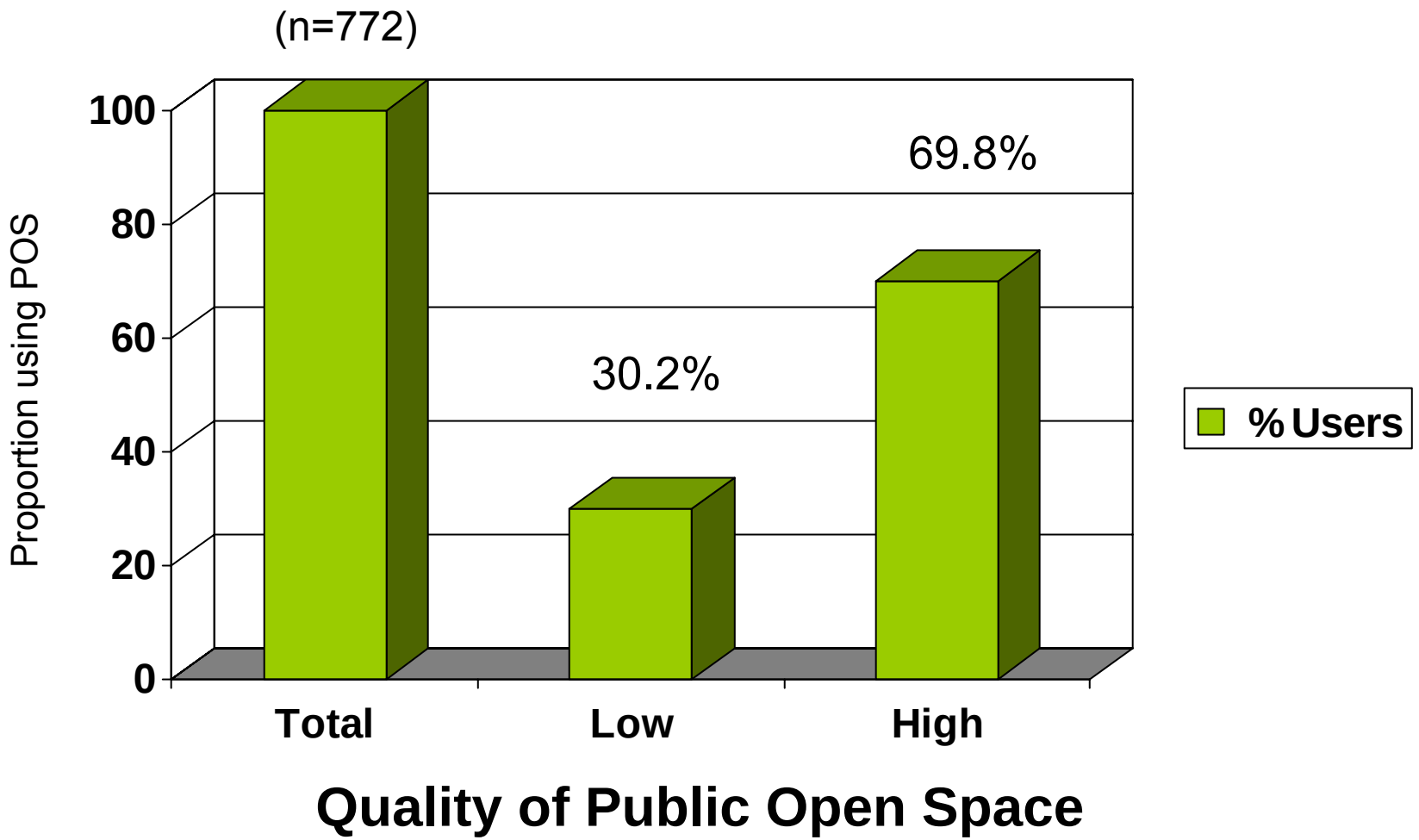
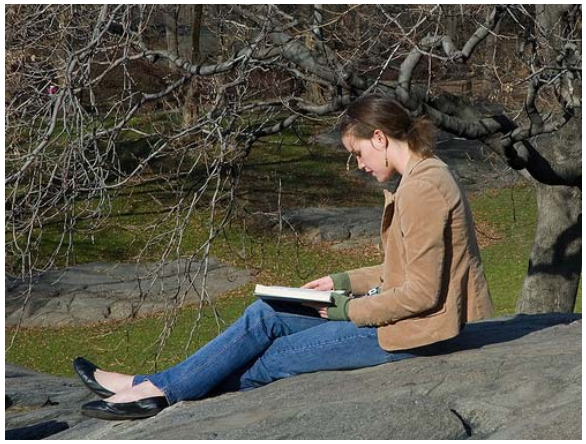
# Not just quantity, but also quality

**(Observation study: Ng, Douglas, Collins 2002)**



# High quality parks increases use (Francis, 2010)

- People reporting access to high **quality parks** almost twice (OR 1.79) as likely to visit their park frequently (i.e, at least once a week)



High quality parks had reticulated lawns, water features, lighting, shade, and walking paths. They also provide a general sense of security and comfort.

# High quality POS =better mental health (Francis, 2010)

Compared with those with a low quality neighbourhood park, those with medium quality parks were 1.8 times more likely to have *low* psychological distress (CI:1.14-2.92), while those in high quality parks were 2.3 times more likely (CI:1.36-3.76)

# Access to POS with quality features varies by neighbourhood socio-economic status in Melbourne

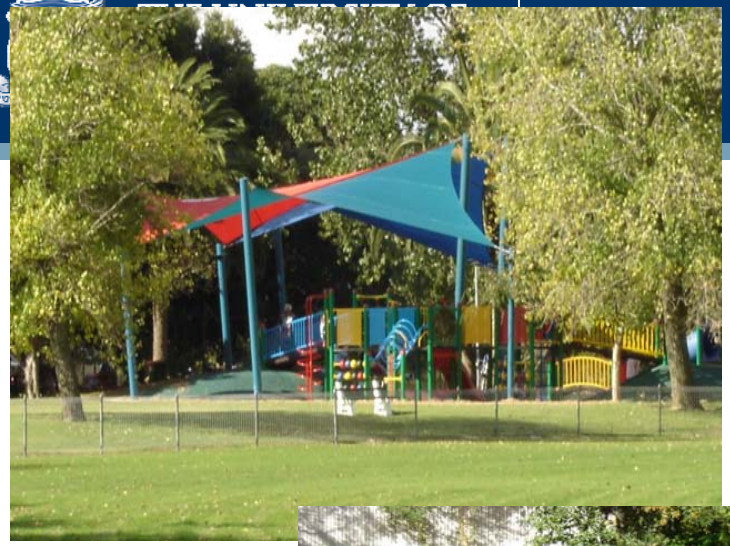
Features of public open space (POS) according to neighbourhood level socio-economic status

| | Quintiles of socio-economic status | | | | | |
|---|---|---|---|---|---|---|
| | Quintile 1 (lowest SES) ($n = 314$) | Quintile 2 ($n = 307$) | Quintile 3 ($n = 288$) | Quintile 4 ($n = 303$) | Quintile 5 (highest SES) ($n = 285$) | $p$-Value[†] |
| Number of recreational facilities (mean (SD)) | 0.6(1.6) | 0.8(2.4) | 0.9(2.1) | 0.7(2.2) | 1.0(3.2) | 0.312 |
| Number of playgrounds (mean (SD)) | 0.5(0.6) | 0.5(0.6) | 0.5(0.6) | 0.5(0.6) | 0.5(0.6) | 0.537 |
| Amenities score (mean, SD))[‡] | 1.5(1.9) | 1.6(2.2) | 2.0(2.5) | 1.5(2.1) | 2.6(2.4) | $<0.0001$ |
| Walking paths (%) | 52.5 | 54.1 | 62.2 | 61.9 | 70.2 | $<0.0001$ |
| Cycling paths (%) | 42.4 | 46.9 | 49.8 | 51.3 | 62.8 | $<0.0001$ |
| Lighting along paths (%) | 12.8 | 5.2 | 11.2 | 12.0 | 21.6 | $<0.0001$ |
| Trees providing shade (%) | 34.7 | 42.3 | 50.7 | 60.9 | 77.5 | $<0.0001$ |
| Water feature (%) | 15.7 | 16.4 | 15.3 | 15.3 | 26.4 | 0.001 |
| Signage regarding dogs (%) | 23.6 | 16.6 | 18.8 | 10.6 | 50.9 | $<0.0001$ |
| Signage restricting other activities (%) | 8.3 | 14.0 | 14.3 | 10.4 | 18.9 | 0.002 |

[†]Significant trend (analysis of variance) for continuous variables, Pearson's $\chi^2$ for categorical variables.

[‡]Significant difference between quintiles 1 and 5, quintiles 2 and 5, quintiles 3 and 5, and quintiles 4 and 5 (Scheffe post hoc tests, $p \leqslant 0.05$).

*D. Crawford et al. / Health & Place 14 (2008) 887–891*

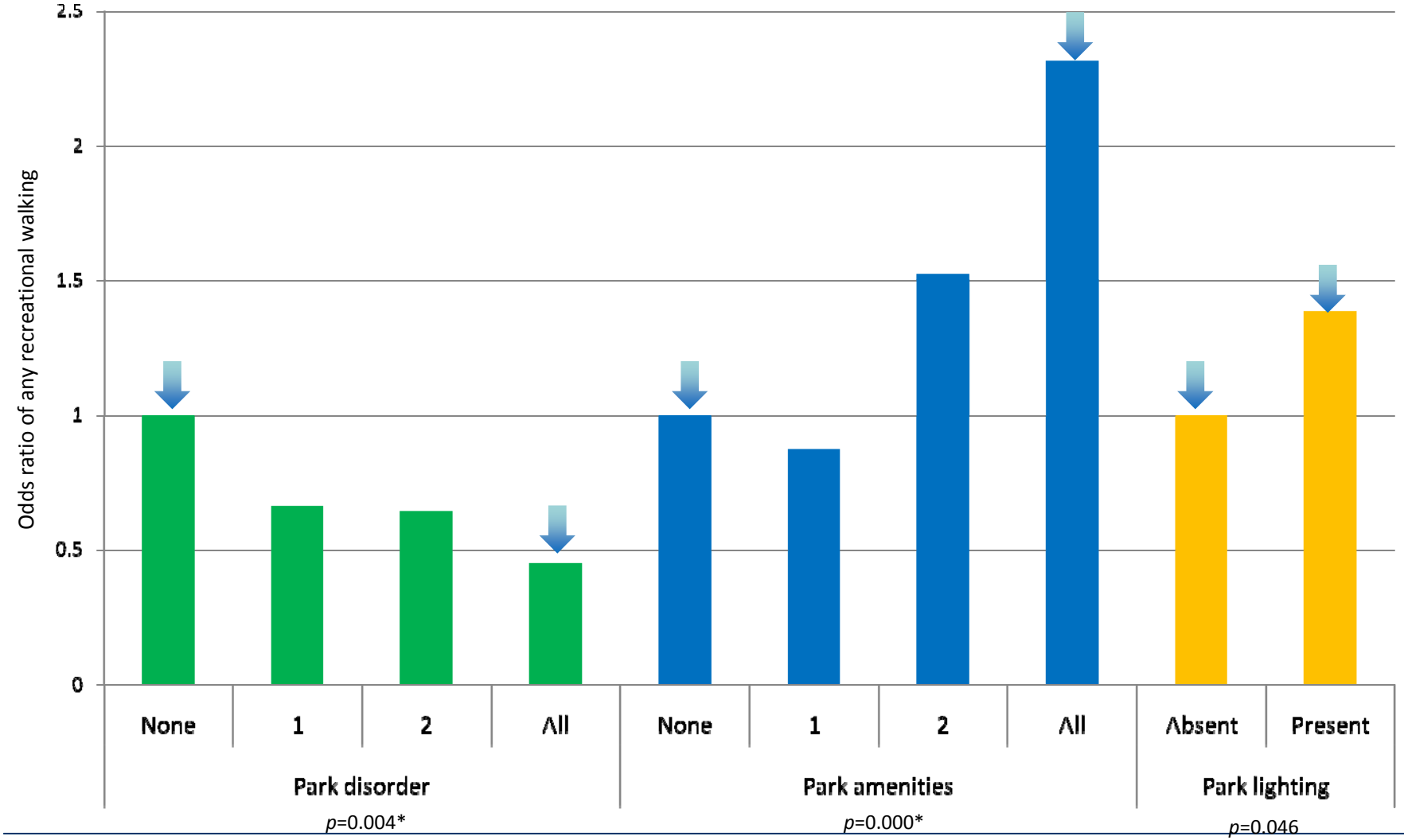


High SES

Low SES

Source: David Crawford, Deakin University

# Likelihood of doing recreational walking varies by park maintenance and amenity (Foster et al. 2010)




*p values for trend test

Analyses adjusted for demographics, area deprivation, significant social and physical environmental variables and clustering within residential development

## What's required?

- Rather than provide many small POS's, it may be better to provide a smaller number of *quality* public open spaces in neighbourhoods that caters for multiple users to:
  - Increase use of POS
  - Increase levels of physical activity (walking and sport)
  - Protect mental health
  - Encourage children's physical activity
  - Increase social capital and sense of community
- Residents of higher density housing need access to a hierarchy of public open space
  - Public open space *substitutes* for private open space

# In summary

- Environmental design that increases active transportation have potential to deliver co-benefits
  - preventive health
  - climate change
  - traffic congestion
  - road safety
  - the economy[1]
- To optimise health, comprehensive approach required to precinct structure planning
  - Densities up to 35 houses/hectare required to support public transport and shops

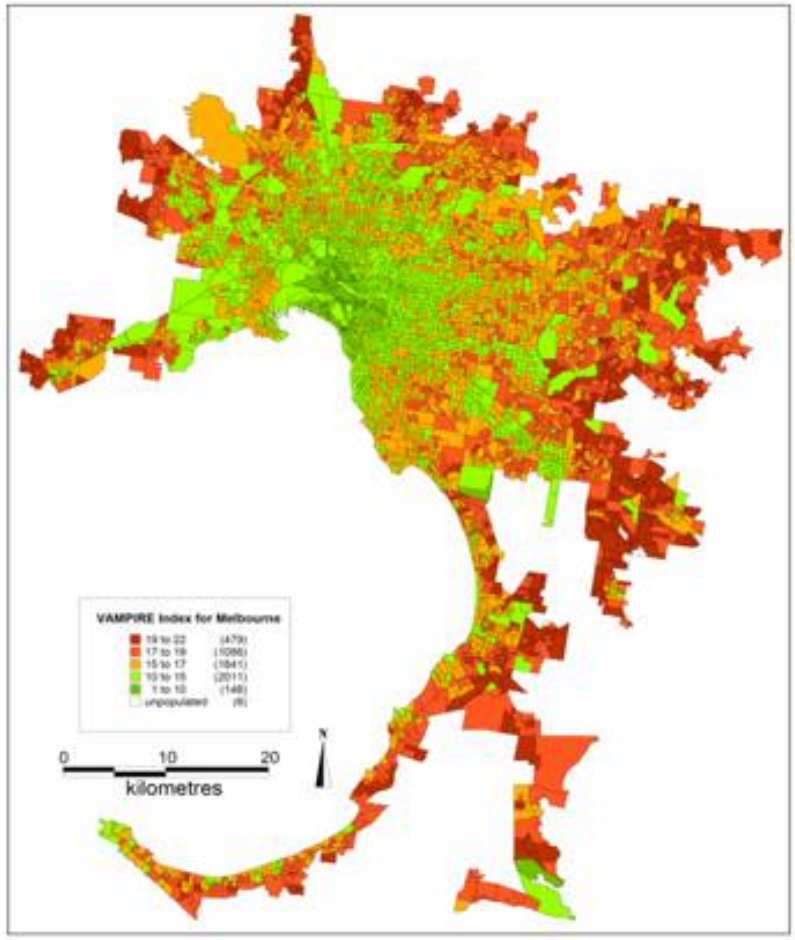
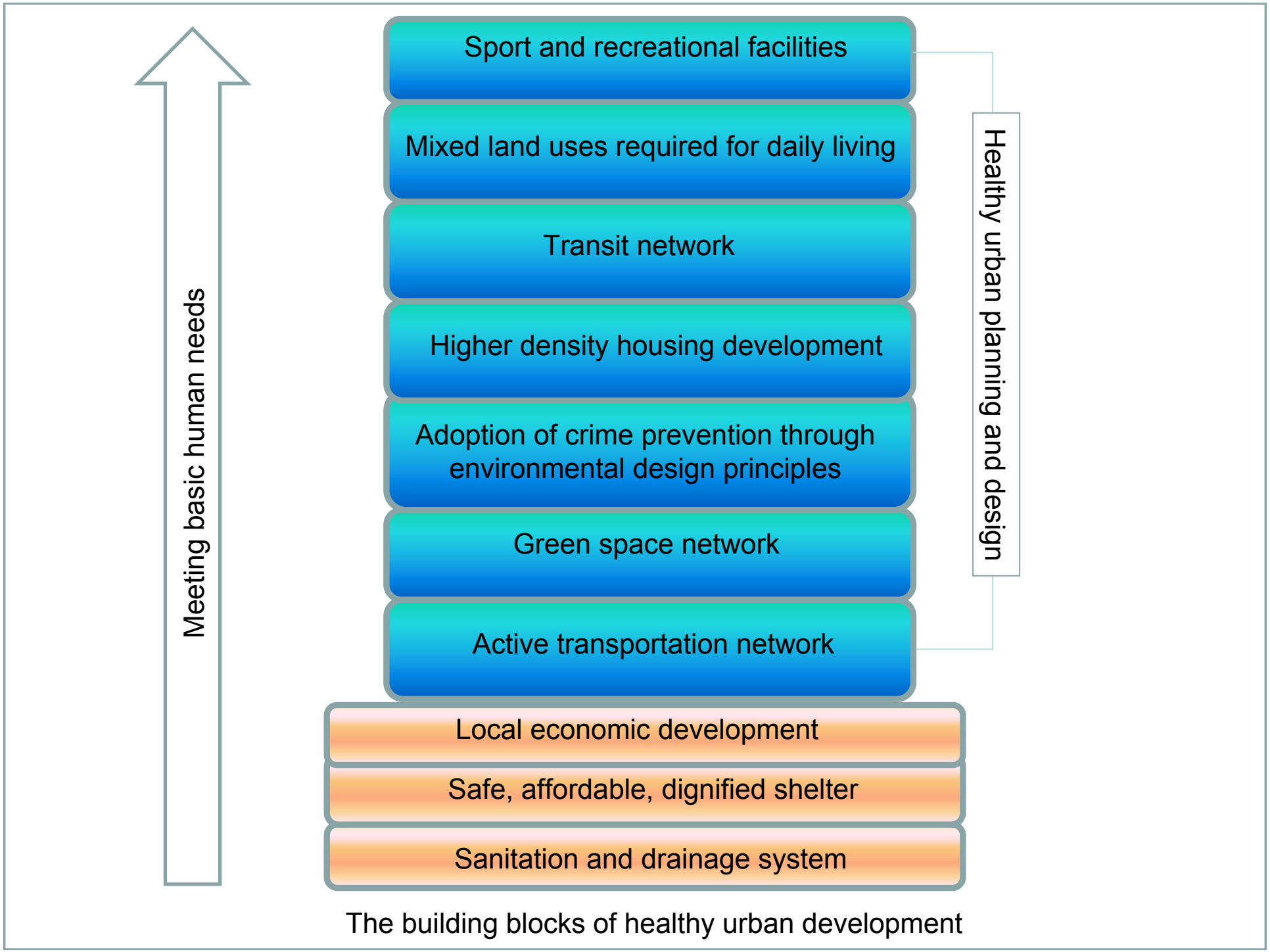



Figure 7: Mortgage and oil vulnerability in Melbourne [2]

1 Vol. 21(5–6) 2010 NSW Public Health Bulletin

[2](Dodson and Snipe 2006)




The building blocks of healthy urban development

# In summary – what's required?

- Environmental interventions designed to increase active transportation have potential to deliver co-benefits
  - preventive health
  - climate change
  - traffic congestion
  - road safety
  - the economy[1]
- To optimise health, comprehensive approach required to precinct planning
- Good policy - difficult to develop (even harder to implement)
  - evidence is critical
    - Monitor impacts on health and sustainability outcomes
    - Provide an early warning system
    - Help build policy that maximises outcomes

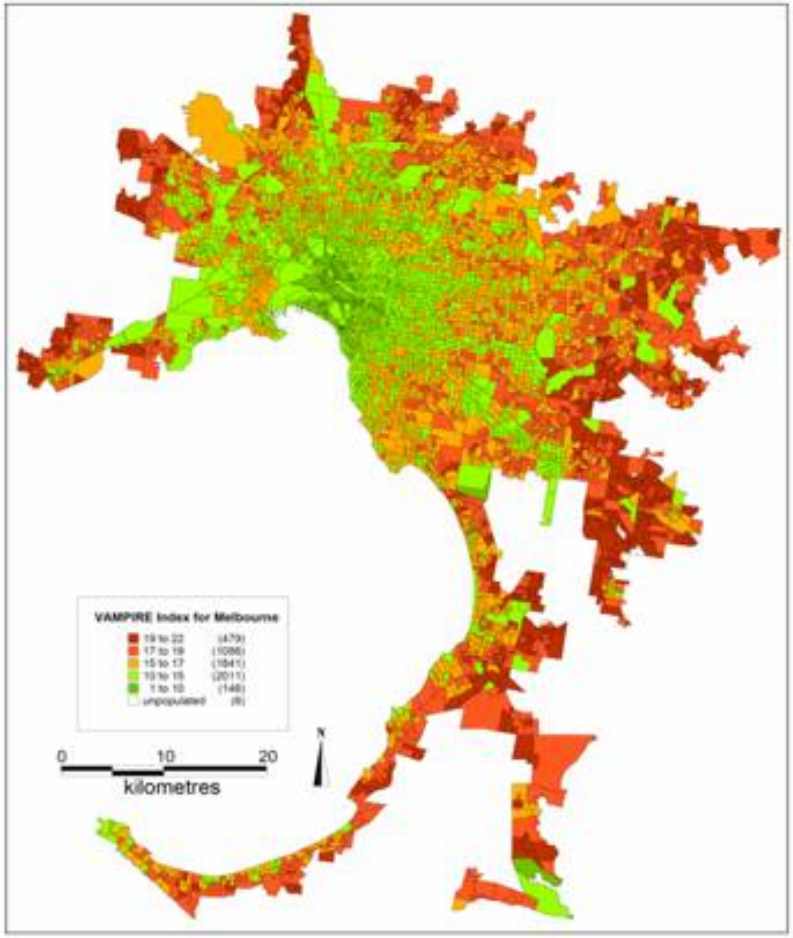



Figure 7: Mortgage and oil vulnerability in Melbourne [2]

[2](Dodson and Snipe 2006)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