

# Neighbourhood environments and children's active travel – findings from participatory GIS in the Neighbourhoods for Active Kids study

Melody Smith

on behalf of the Neighbourhoods for Active Kids Study team



@MelOliverSmith



researchgate.net/profile/Melody\_Smith11



kidsinthecity.ac.nz





## Associations between the neighbourhood built environment and out of school physical activity and active travel: An examination from the Kids in the City study

Melody Oliver<sup>a,\*</sup>, Suzanne Mavoa<sup>b,c</sup>, Hannah Badland<sup>c</sup>, Karl Parker<sup>b</sup>, Phil Donovan<sup>b</sup>, Robin A Kearns<sup>d</sup>, En-Yi Lin<sup>b</sup>, Karen Witten<sup>b</sup>

<sup>a</sup> Human Potential Centre, Auckland University of Technology, Mail #P-1, Private Bag 92006, Auckland 1142, New Zealand

<sup>b</sup> SHORE and Whariki Research Centre, School of Public Health, Massey University, PO Box 6137, Wellesley Street, Auckland, New Zealand

<sup>c</sup> McCaughey VicHealth Community Wellbeing Unit, Melbourne School of Population and Global Health, The University of Melbourne, Level 5, 207 Bouverie Street, Melbourne, Victoria 3010, Australia

<sup>d</sup> School of Environment, The University of Auckland, Auckland, New Zealand



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## Kids in the City: Children's Use and Experiences of Urban Neighbourhoods in Auckland, New Zealand

PENELOPE CARROLL<sup>a</sup>, KAREN WITTEN<sup>a\*</sup>, ROBIN KEARNS<sup>b</sup> & PHIL DONOVAN<sup>a</sup>

<sup>a</sup>School of Public Health, Massey University, Auckland, New Zealand; <sup>b</sup>School of Environment, University of Auckland, Auckland, New Zealand

Oliver et al. *International Journal of Behavioral Nutrition and Physical Activity* 2014, **11**:70  
<http://www.ijbnpa.org/content/11/1/70>



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### RESEARCH

### Open Access

## Environmental and socio-demographic associates of children's active transport to school: a cross-sectional investigation from the URBAN Study

Melody Oliver<sup>1\*</sup>, Hannah Badland<sup>2</sup>, Suzanne Mavoa<sup>2</sup>, Karen Witten<sup>3</sup>, Robin Kearns<sup>4</sup>, Anne Ellaway<sup>5</sup>, Erica Hinckson<sup>1</sup>, Lisa Mackay<sup>1</sup> and Philip J Schluter<sup>1,6</sup>

### Abstract

**Background:** Active transport (e.g., walking, cycling) to school (ATS) can contribute to children's physical activity and health. The built environment is acknowledged as an important factor in understanding children's ATS, alongside parental factors and seasonality. Inconsistencies in methodological approaches exist, and a clear understanding of factors related to ATS remains equivocal. The purpose of this study was to gain a better

**ABSTRACT** Cities are largely designed for adults and cars, not children. Auckland City's 'children first' approach signals a shift in policy focus to consider the needs of children. The authors' 'Kids in the City' research is helping inform this approach by providing policy-relevant information about children's use and experiences of nine Auckland neighbourhoods, suburban and inner-city, using trip diaries, child-led walking interviews and discussion groups. The children were neighbourhood key informants – co-producers of knowledge who reported on their environments, discussed what they liked and disliked, their safety concerns and their limited mobility, and made suggestions for more 'child-friendly' neighbourhoods.

# Access

to services

# Equality

Be **safe**

Influence

**decision** making

# Active agents

in planning

Being **heard** and **respected**

# Fulfils children's

# rights

Live in an  
unpolluted  
environment

Express  
**opinions**

# Participate

in  
community life

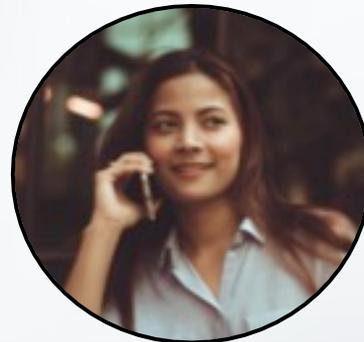
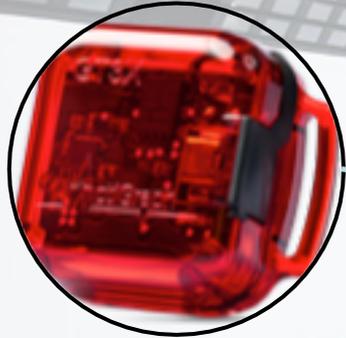
Reflected in  
**policies**, laws,  
programmes, budgets



BUILDING CHILD FRIENDLY CITIES  
A Framework for Action

UNICEF  
United Nations Children's Fund

unicef



Oliver M, McPhee J, Carroll P, Ikeda E, Mavoa S, Mackay L, Kearns RA, Kytta M, Asiasiga L, Garrett N, Lin J, Mackett R, Zinn C, Moewaka Barnes H, Egli V, Prendergast K, Witten K. (2016). *Neighbourhoods for Active Kids: Study protocol for a cross sectional examination of neighbourhood features and children's physical activity, active travel, independent mobility and body size. BMJ Open, 6(8):e013377. doi: 10.1136/bmjopen-2016-013377*



## Participants & Data

**19** Schools, diverse in geography and area-level deprivation

**1102** Children aged 8-13 years, 51% female

**13%** Māori, 15% Pacific, 13% Asian, 40% European

**4676** Neighbourhood comments included in content analysis

**727** Outdoor advertisements around schools classified by content and audience

**3492** School route comments included in content analysis from 974 children

**Meaningful differences** found between child-mapped and estimated (using Geographic Information Systems) routes to school in terms of spatial overlap, distance to school, traffic exposure (using road hierarchy), and route directness

Children most frequently noted distance to school.  
Comments were both positive and negative:

*“its fast and it’s the closest way to get to school”*

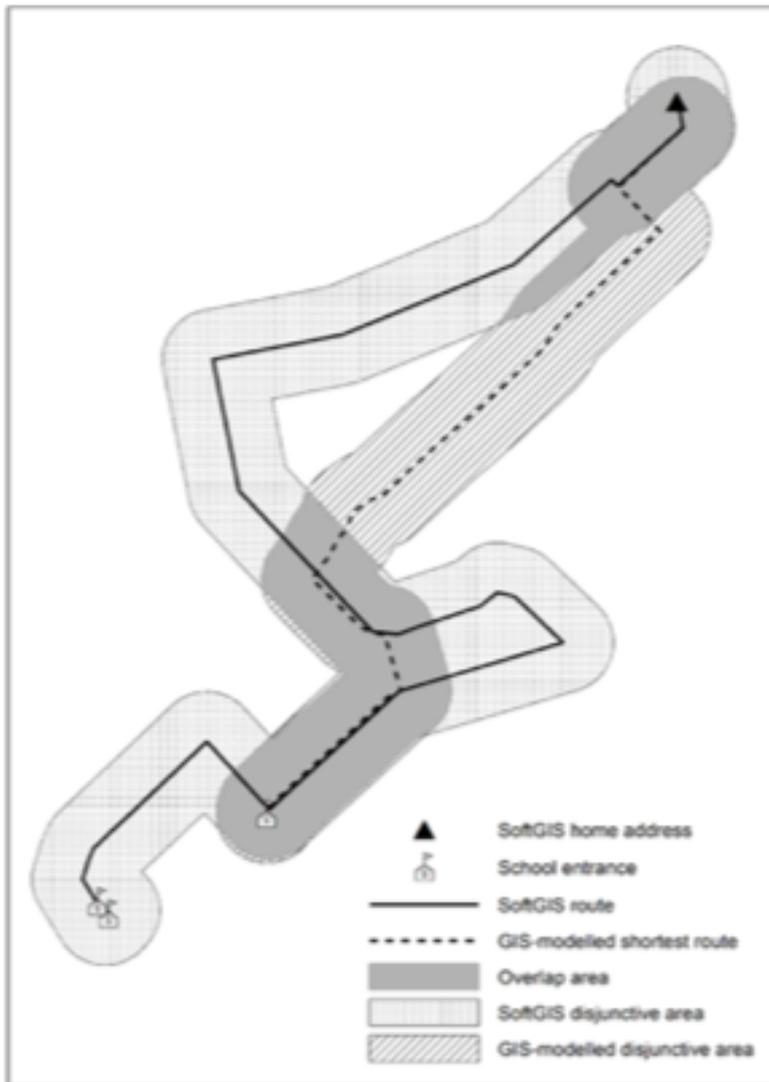
*“its far so it gives me time to talk to my friends”*

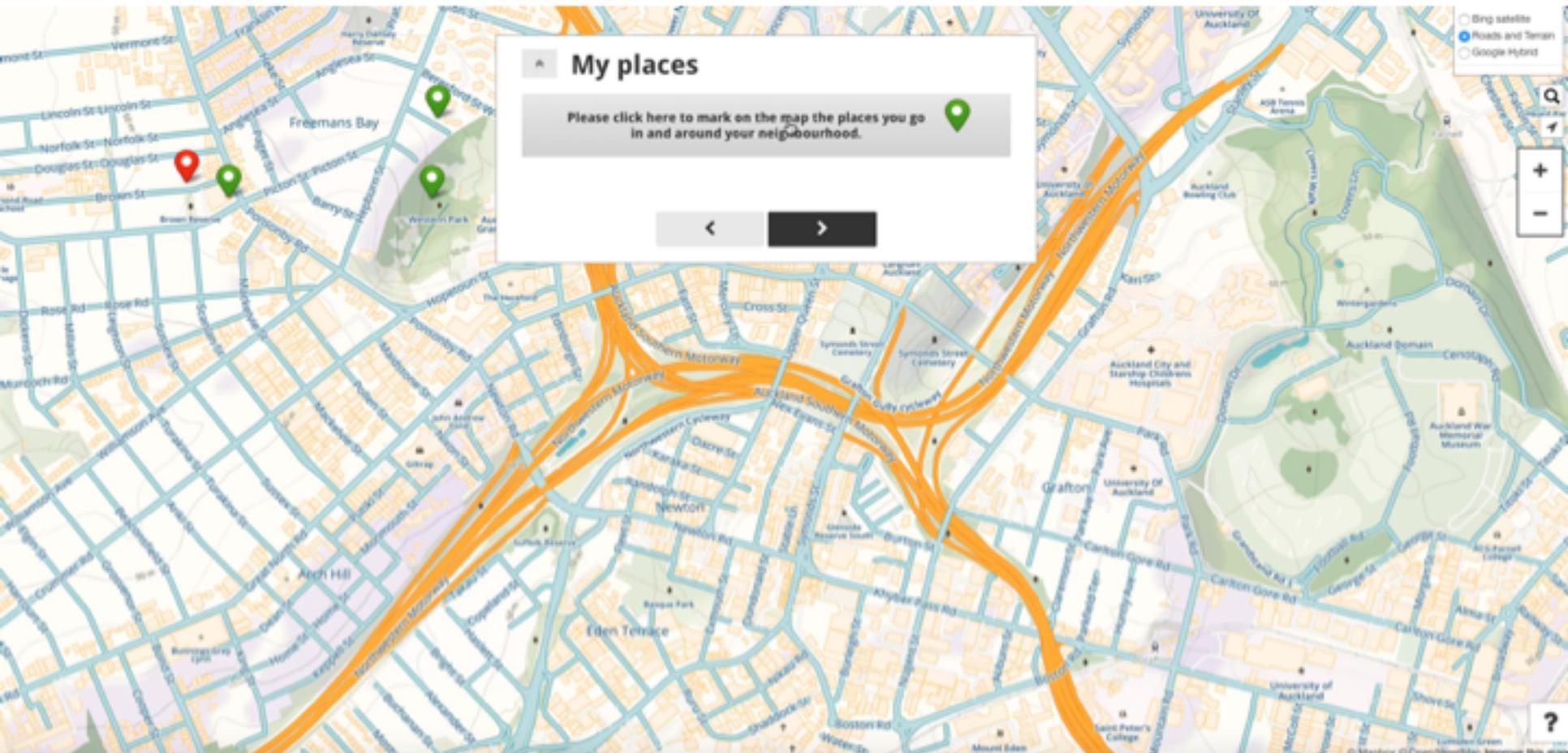
They enjoyed the opportunity the school trip provides  
to spend time with friends and family:

*“i like that we get to pick up up my friend so we can walk together”*

*“I like to sit down and talk to my mum in the car”*

Children noted concerns about air pollution and a desire for safe streets/safety from traffic and regular and uncrowded public transport





**My places**

Please click here to mark on the map the places you go in and around your neighbourhood.

< >

- Bing satellite
- Roads and Terrain
- Google Hybrid

Q

+

-



## Challenge 2: Complexity



Don't know  
where  
anything is

What does  
this mean?

Which  
home do I  
choose?

I'm  
"lost"

Can't  
remember





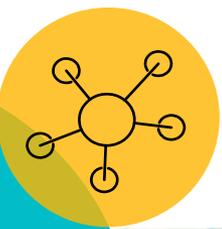
## Challenge 3: Multiple homes

Distance (m)	1 home (n = 903)	>1 home (n = 122)	All (n = 1025)
Mean	32.7	71.2	37.2
Median	9.6	10.8	9.6
Minimum	0.2	0.4	0.2
Maximum	1428.8	2553.5	2553.5



12%  
>1 address

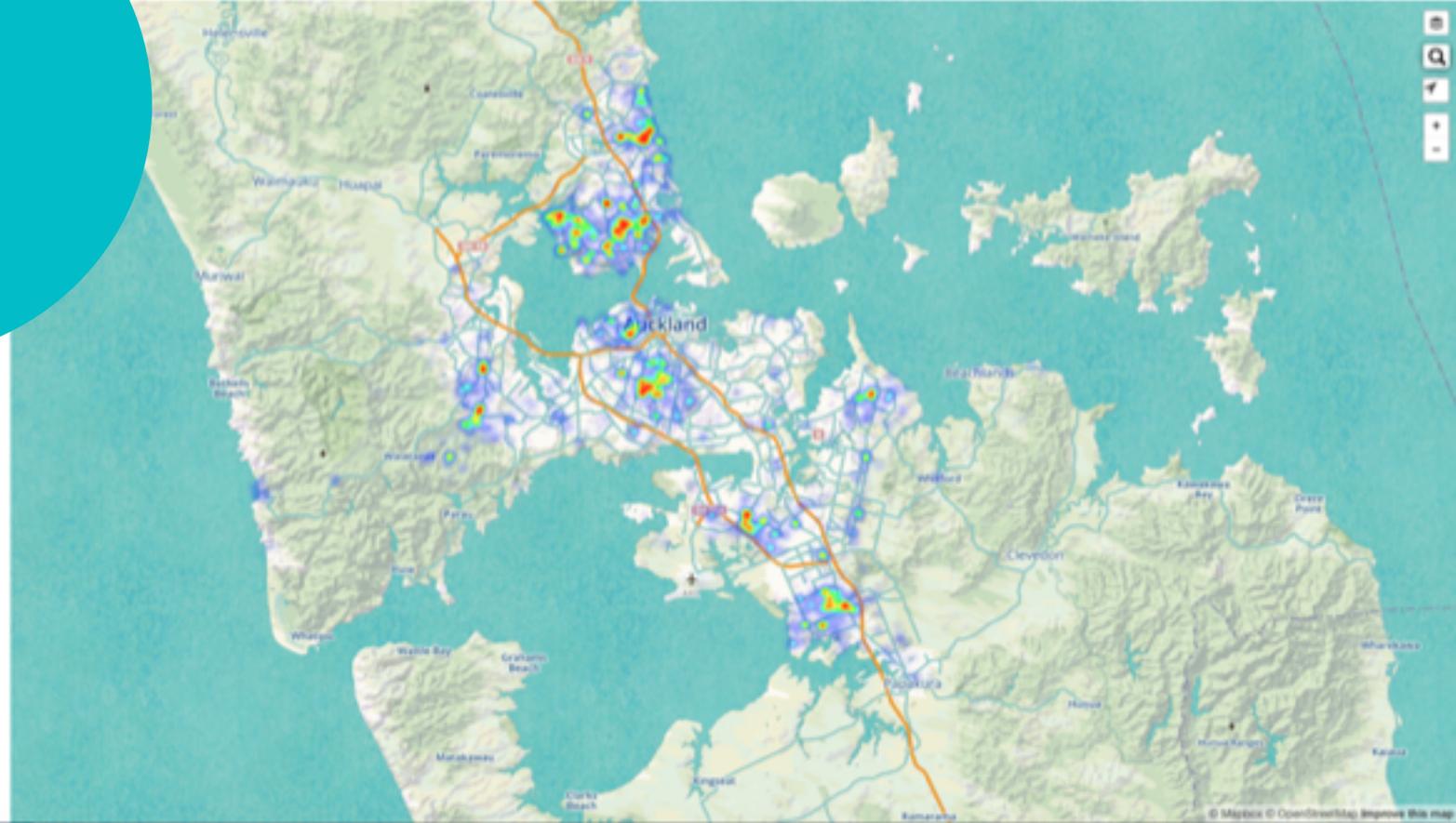
# Challenge 4: Cleaned datasets

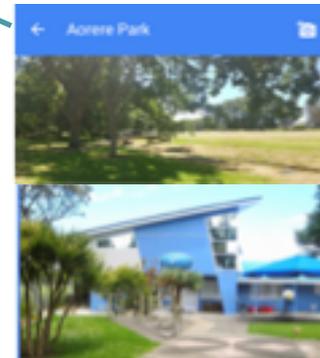
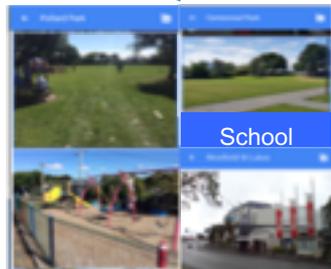
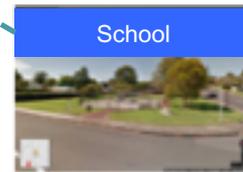
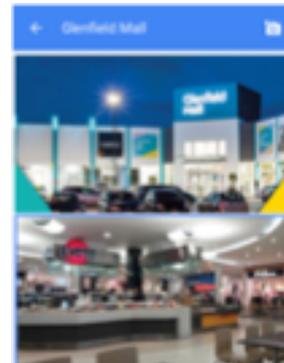
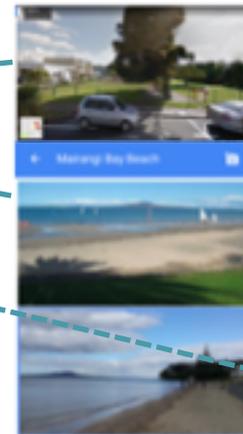
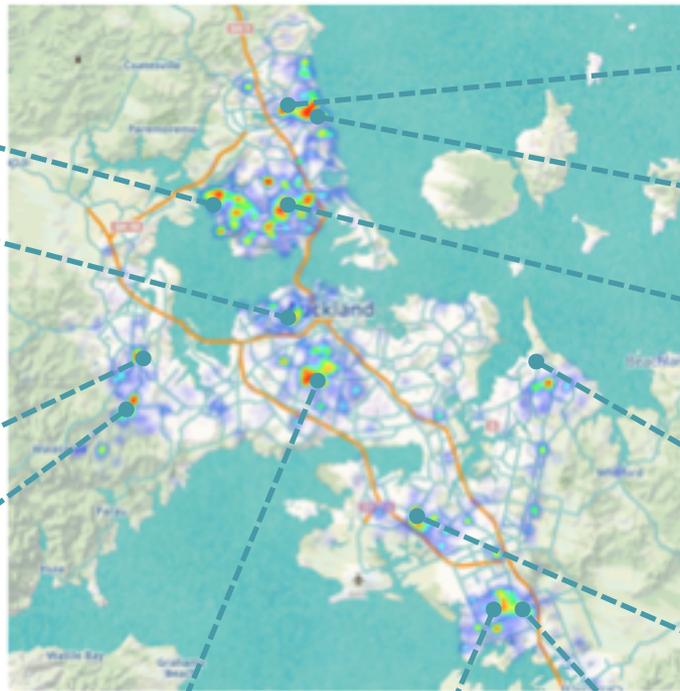


Intensity

Blur

Radius





How do you usually get here?	Walk
How do you usually get here? --- if another way, how?	
Who do you usually come here with?	With other children (no adults)
How much do you like it here?	5
Please tell us anything you like or dislike about this place.	I like that there is heaps of room to play I don't like that there is sometimes rubbish everywhere

How do you usually get here?	Walk
How do you usually get here? --- if another way, how?	
Who do you usually come here with?	With other children (no adults)
How much do you like it here?	5
Please tell us anything you like or dislike about this place.	I like that it's a good place for running on the field and concrete area, it's fun because I can play in the park I don't like that there's no shelter at the park which means I hate it when it rains because we then run home and once we get home we are drenched and our clothes are soaking wet

Question	Answer
How do you usually get here?	Walk
How do you usually get here? --- if another way, how?	
Who do you usually come here with?	With other children (no adults)
How much do you like it here?	5
Please tell us anything you like or dislike about this place.	I like that there is a big place to play in I don't like that sometimes the rubbish that is left behind and the taggins on the walls make the place look untidy (because if it's untidy I then don't feel like playing there).

## Neighbourhood-level geospatial profiles indicated:

Clustering of child-marked (softGIS) points around parks and shops (consistent with open ended items)

Outdoor advertising of unhealthy food and beverages is geographically widespread, but also clustered around shops and locations where children spend time

Child-marked points are frequently near unhealthy food and beverage outlets

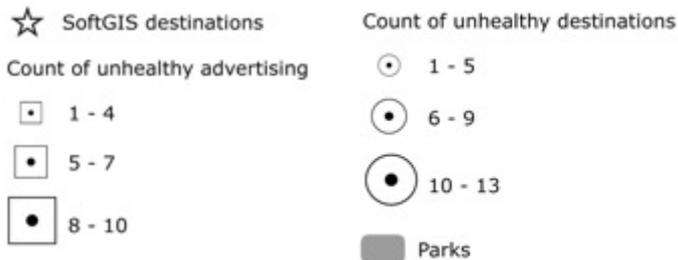
Children frequently marked parks close to schools as key destinations

Approximately 2/3 of schools had clustering of unhealthy advertising/outlets nearby

Higher proportion of unhealthy advertising around schools with higher area-level deprivation



### Legend



## Kids – Perceptions of Neighbourhood Destinations (PoND)

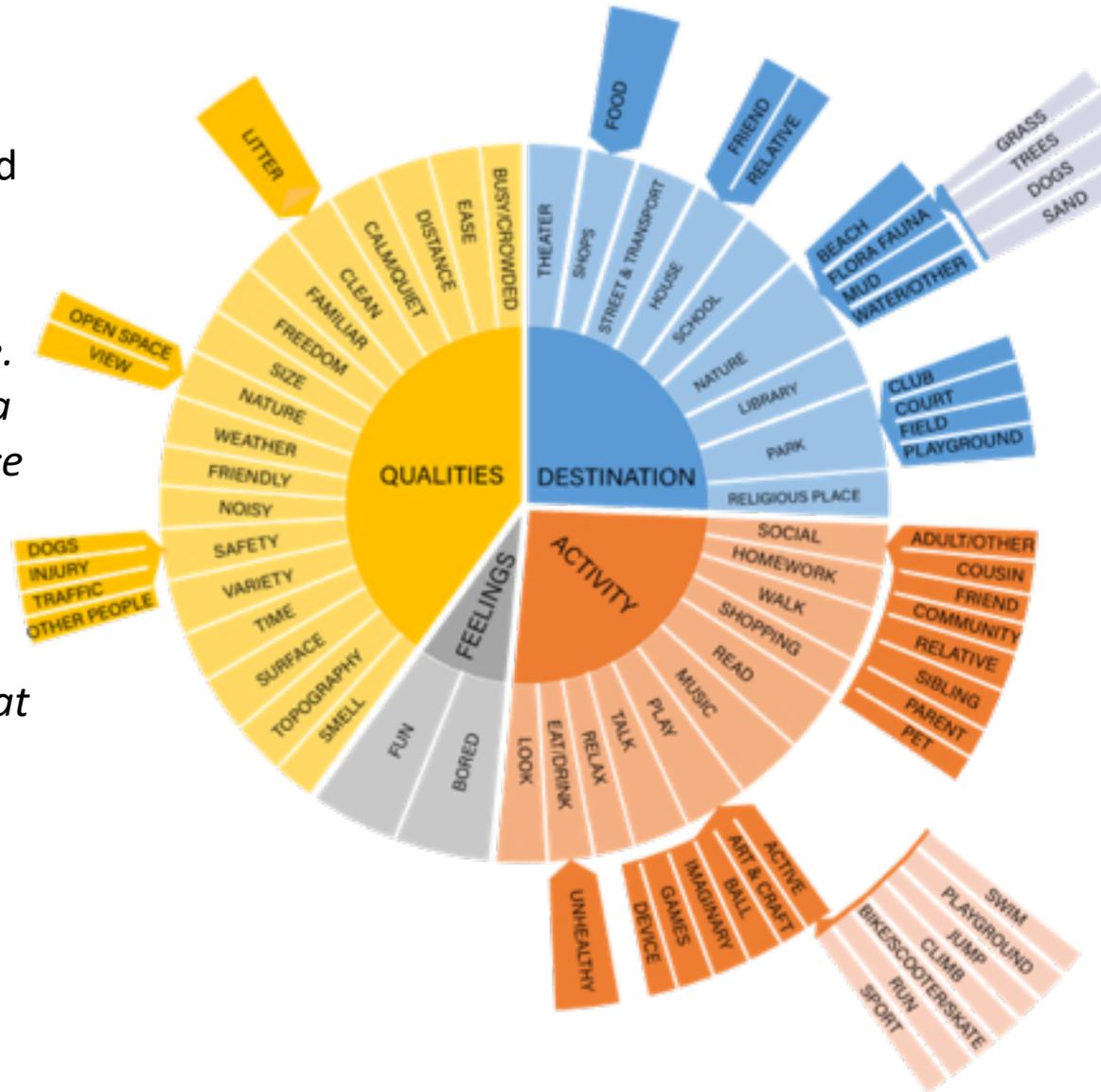
Large, multi-use parks/outdoor settings with a variety of options and facilities for active play and socialization were important:

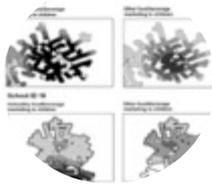
*“...its fun theres so much to do there. theres a beach if you want to swim a park if you want to play and its a nice place to hang out with friends”*

*“I like the different games that you and play there and the trees, so you can play hide and seek. I also like that there are toilets and drinking fountains near by.”*

Shops (especially food shops) were frequently mentioned and often contextualized with purchasing/consuming unhealthy food and drink:

*“its a dairy and they have good lollies”*



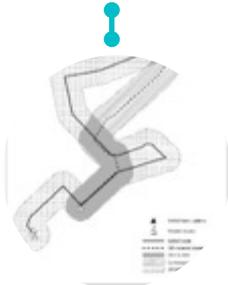
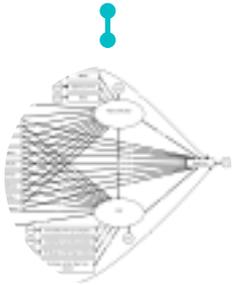


Child school route perceptions

Kernel density

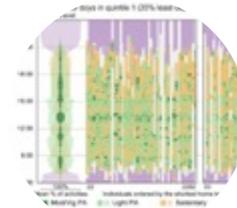
Compositional time use analysis

Associations between the built environment and children's physical activity and sedentary time

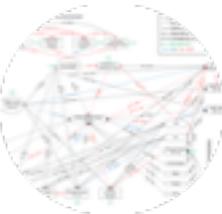
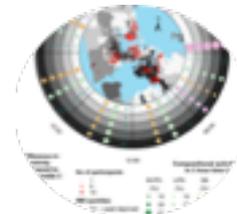


3<sup>rd</sup> & 4<sup>th</sup> places, physical activity, social cohesion

Independent mobility boundaries



Walking and cycling boundaries



Oliver M, McPhee J, Carroll P, Ikeda E, Mavoa S, Mackay L, Kearns RA, Kyttä M, Asiasiga L, Garrett N, Lin J, Mackett R, Zinn C, Moewaka Barnes H, Egli V, Prendergast K, Witten K. (2016). Neighbourhoods for Active Kids: Study protocol for a cross-sectional examination of neighbourhood features and children's physical activity, active travel, independent mobility, and body size. *BMJ Open*, 6(8), e013377, doi: [10.1136/bmjopen-2016-013377](https://doi.org/10.1136/bmjopen-2016-013377)

Ikeda E, Mavoa S, Hinckson E, Witten K, Donnellan N, Smith M. (2018). Differences in child-drawn and GIS-modelled routes to school: Impact on space and exposure to the built environment in Auckland, New Zealand. *Journal of Transport Geography*, 71, 103-115, doi: [10.1016/j.jtrangeo.2018.07.005](https://doi.org/10.1016/j.jtrangeo.2018.07.005)

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Ikeda E, Hinckson E, Witten K, Smith M. (in press). Are perceived physical and social environments associated with children's active school travel? A systematic review. *Health and Place*.

# Take home messages (for now!)

- Capturing spatial patterning of children's perceptions has provided a fine-grained understanding of specific neighbourhood features of importance from the child's perspective.
- Geospatial data and content analysis of children's reported neighbourhood destination use demonstrate the important role of public outdoor spaces and shops in children's lives.
- Evidence for unhealthy food environments around schools, and children's use of these is presented.
- Child-reported routes to school do not align with researcher-estimated routes.
- Differences in environment characteristics were observed between child-mapped and researcher-estimated routes to school.
- Taking a child-centred approach to measuring neighbourhood use and experiences can yield sensitive and in-depth understanding of contextual factors important for promoting child health behaviours and outcomes.