

Innovative measurement of children's school travel behaviour & perceptions on their school travel routes

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Neighbourhoods for Active Kids (NfAK)



19 schools
• 10 primary
• 9 intermediate



1102 children
• 9-12 years

cross-
sectional
study

Auckland,
NZ



BMJ Open 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

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ABSTRACT

Introduction: New Zealand children's physical activity, including independent mobility and active travel, has declined markedly over recent decades. The Neighbourhoods for Active Kids (NfAK) study examines how neighbourhood built environments are associated with the independent mobility, active travel, physical activity and neighbourhood experiences of children aged 9–12 years in primary and intermediate schools across Auckland, New Zealand's largest city.

Methods and analysis: Child-specific indices of walkability, destination accessibility and traffic exposure will be constructed to measure the built environment in 8 neighbourhoods in Auckland. Interactive online-mapping software will be used to measure children's independent mobility and transport mode to destinations and to derive measures of neighbourhood use and perceptions. Physical activity will be measured using 7-day accelerometry. Height, weight and waist circumference will be objectively measured. Parent telephone interviews will collect sociodemographic information and parent neighbourhood perceptions.

Strengths and limitations of this study

- Strengths of the study are the strategic school recruitment methods to ensure a large sample of children, heterogeneous in terms of socioeconomic deprivation, ethnicity, age and geographic location.
- The use of child-centred methods to collect information on children's use and perceptions of their neighbourhood environments is anticipated to garner unique insights that would not otherwise be captured.
- Objective measures of physical activity, body size and the neighbourhood built environment are key strengths.
- Limitations are that the data are cross-sectional, so causality cannot be implied. Data are being collected in one New Zealand city only. Nutrition and travel behaviours are being self-reported by children; however, the concurrent proxy reporting of these behaviours by parents will be used to improve accuracy of these variables.

Aims



To utilise **new technology** to measure:



- Children's school travel behaviour (i.e., mode of travel & travel route to school)
- Their perceptions about their school route, neighbourhood safety & traffic around school



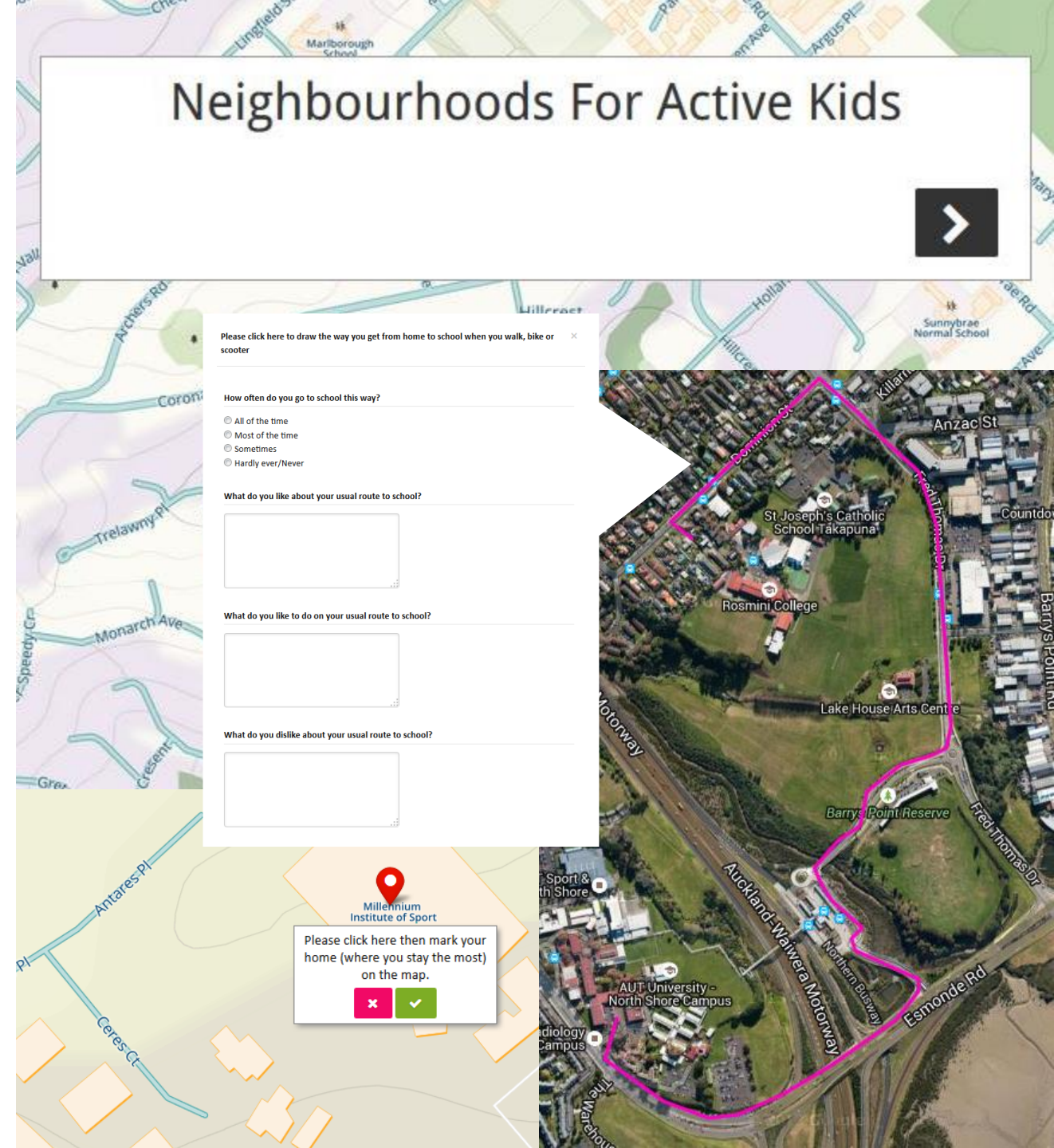
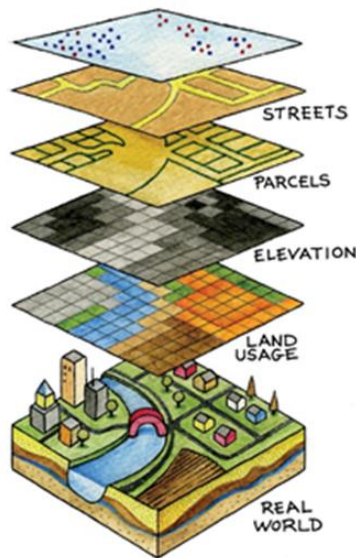
Measures

Child

- SoftGIS survey

Built Environment

- Geographic Information Systems (GIS)

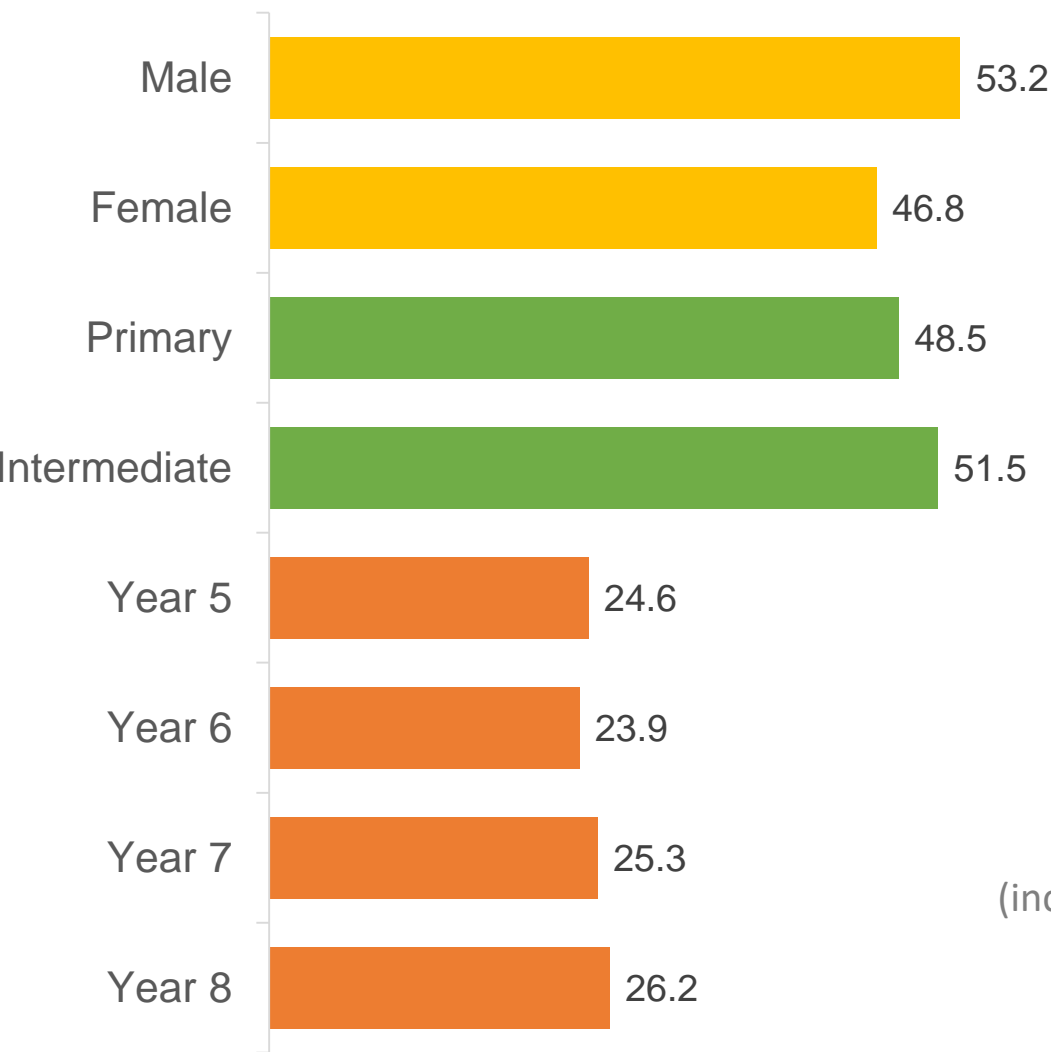


Neighbourhoods For Active Kids

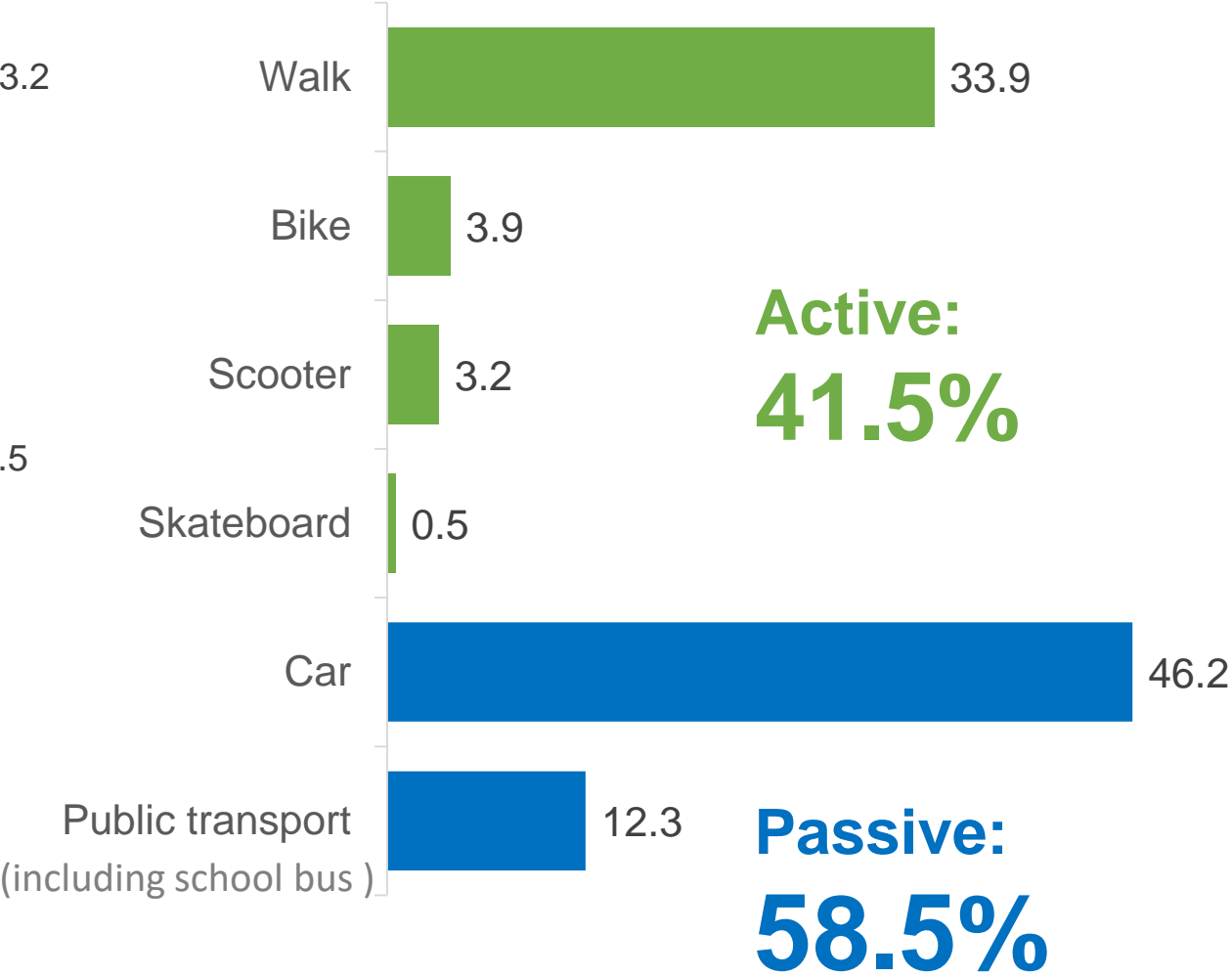


Results

Participant Characteristics [%]

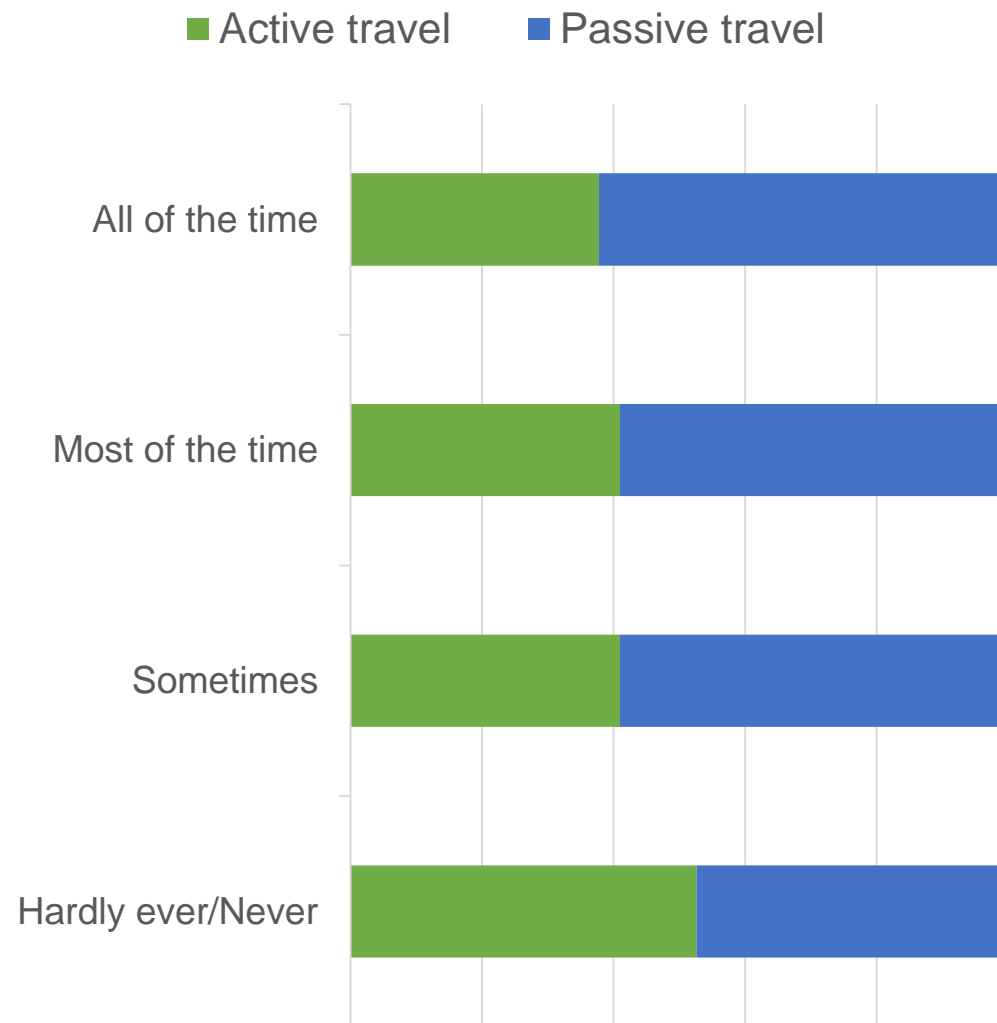


Usual School Travel Mode [%]

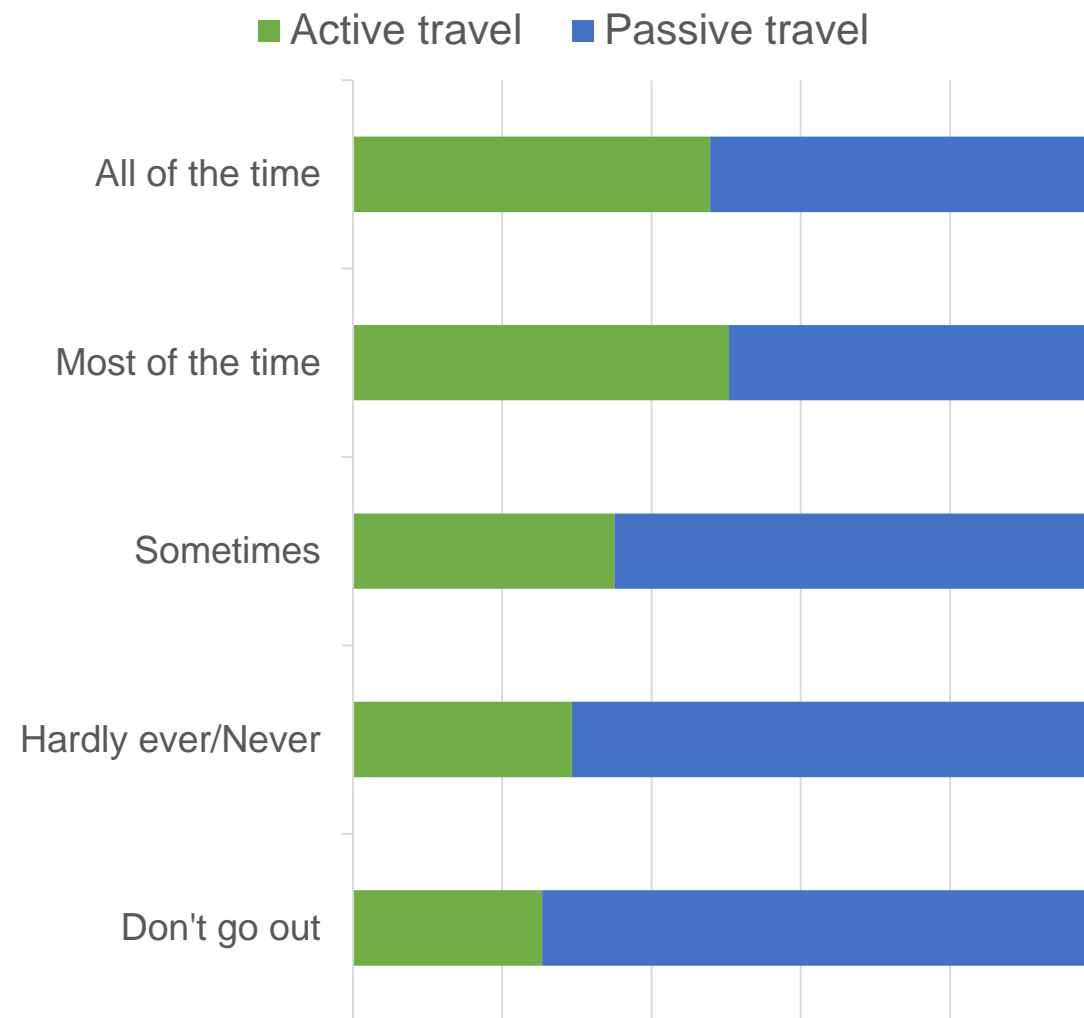




Traffic Perception [%] (Busy roads around school)



Neighbourhood Safety Perception [%] (When out without an adult)



Like to Do on Usual School Route



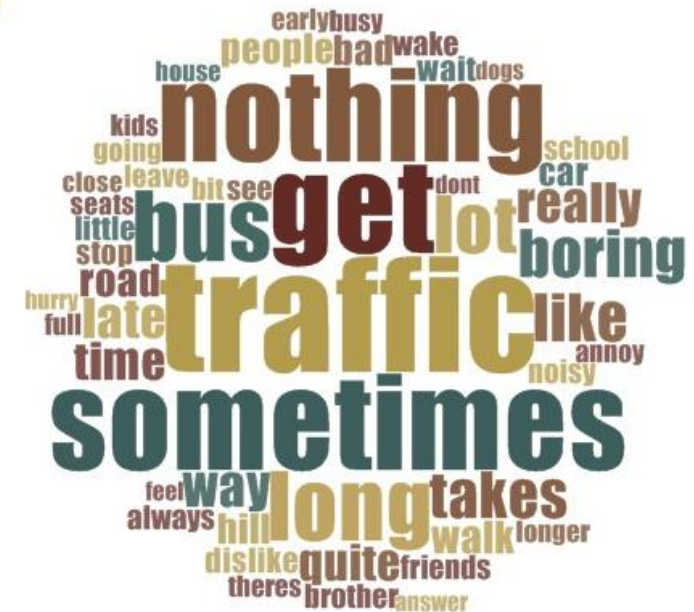
Active Travel



Dislike about Usual School Route



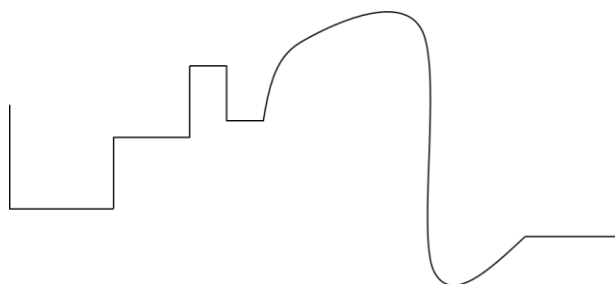
Active Travel



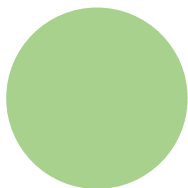
Defining a Child Specific School Travel Boundary

Purpose:

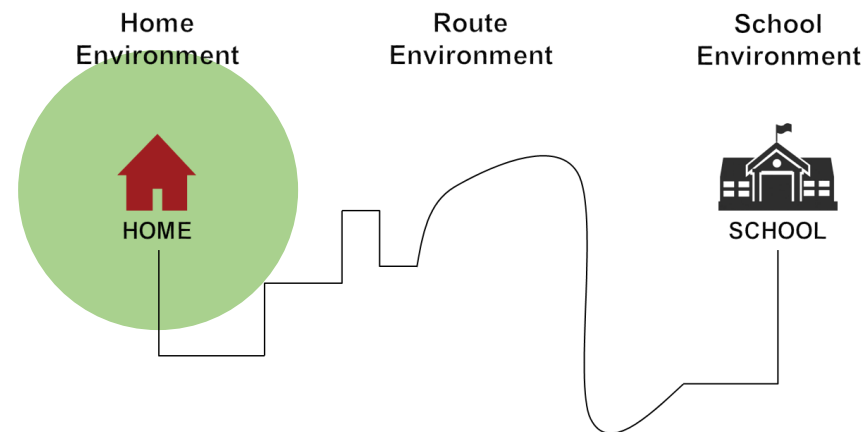
To define a child specific school travel boundary to capture environmental attributes that children are potentially exposed to during their school travel.



SoftGIS-mapped school route



VS.



Child specific school travel boundary (Mavoa, 2015)

= street network buffer

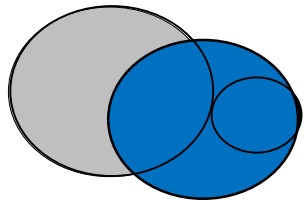
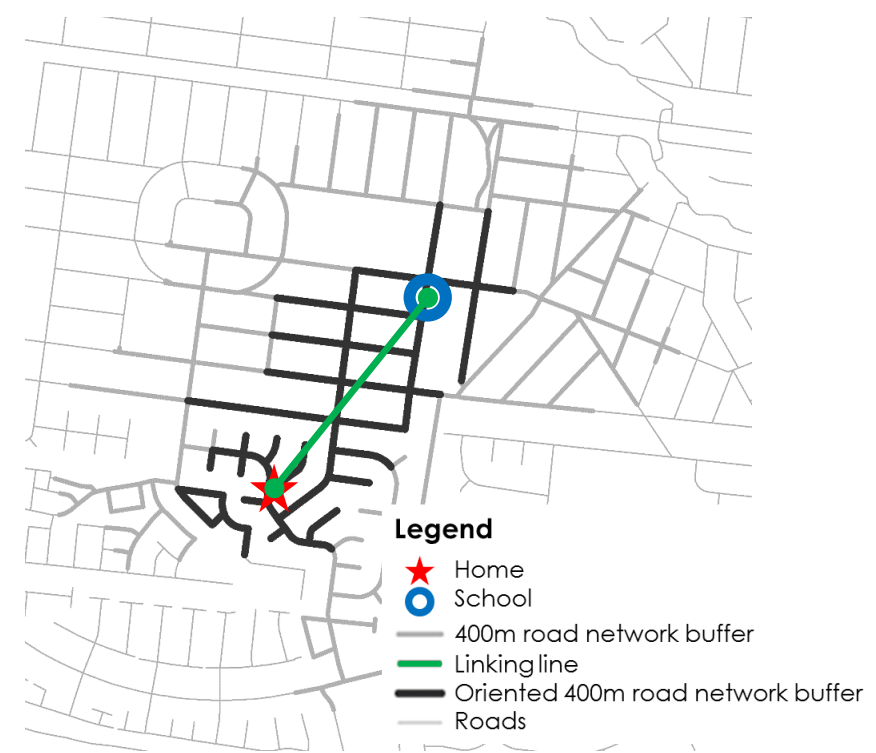
+ school location

+ pedestrian paths

+ private & public spaces along the street network

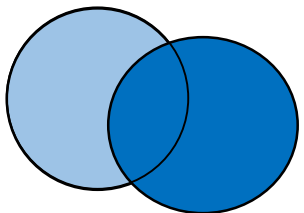
+ the orientation of the buffer

+ the shape (width & length) of the buffer



$$a = 1 \cap 2 / 1 \times 100$$
$$b = 1 \cap 2 / 2 \times 100$$

- 1 SoftGIS-mapped school route
- 2 School travel boundary
- 3 Euclidean buffer(s)



$$c = 1 \cap 3 / 1 \times 100$$
$$d = 1 \cap 3 / 3 \times 100$$

$(a + b)$ vs. $(c + d)$

Caterpillar vs. Euclidean



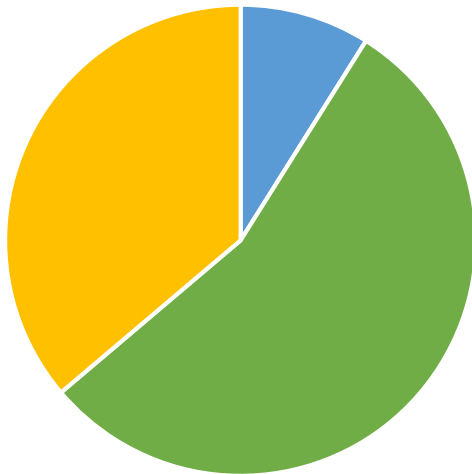
Discussion

- SoftGIS is an effective tool

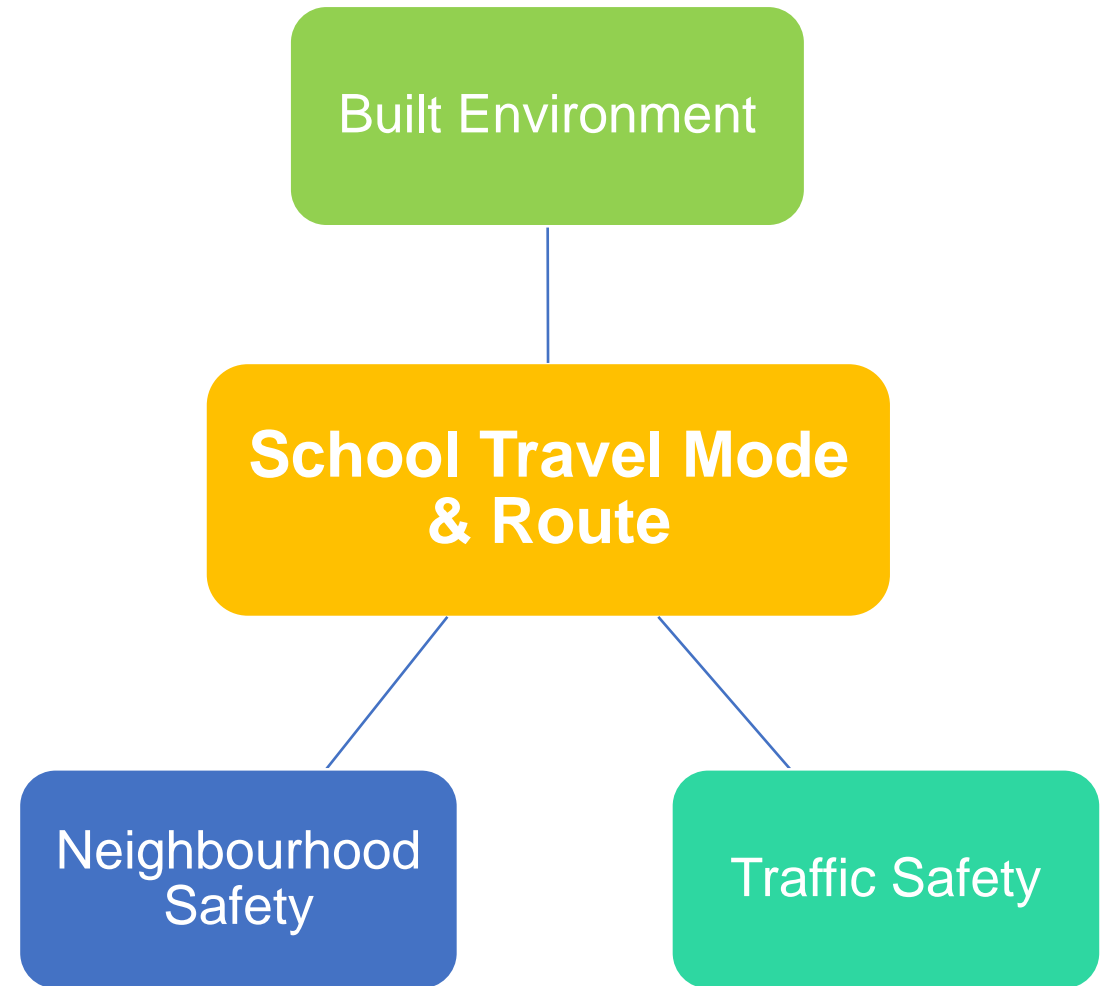
In-depth information of children's school travel behaviour

How Hard to Use the Maps [%]

■ Very hard ■ OK ■ Easy



- Children's perceptions



Conclusion

What can encourage children to actively travel to school?

- Development of pedestrian/cycle infrastructure



- Community support to improve traffic & neighbourhood safety



Travelwise
School

Auckland
Transport
An Auckland Council Organisation



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THANK YOU

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Moushumi Chaudhury

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Results

Usual School Travel Mode (%)

