

BEATS Study

Built Environment and
Active Transport to School

www.otago.ac.nz/beats



Challenges for Encouraging Active Transport to School in Urban and Rural Areas: BEATS Study Findings

Associate Professor Sandy Mandic

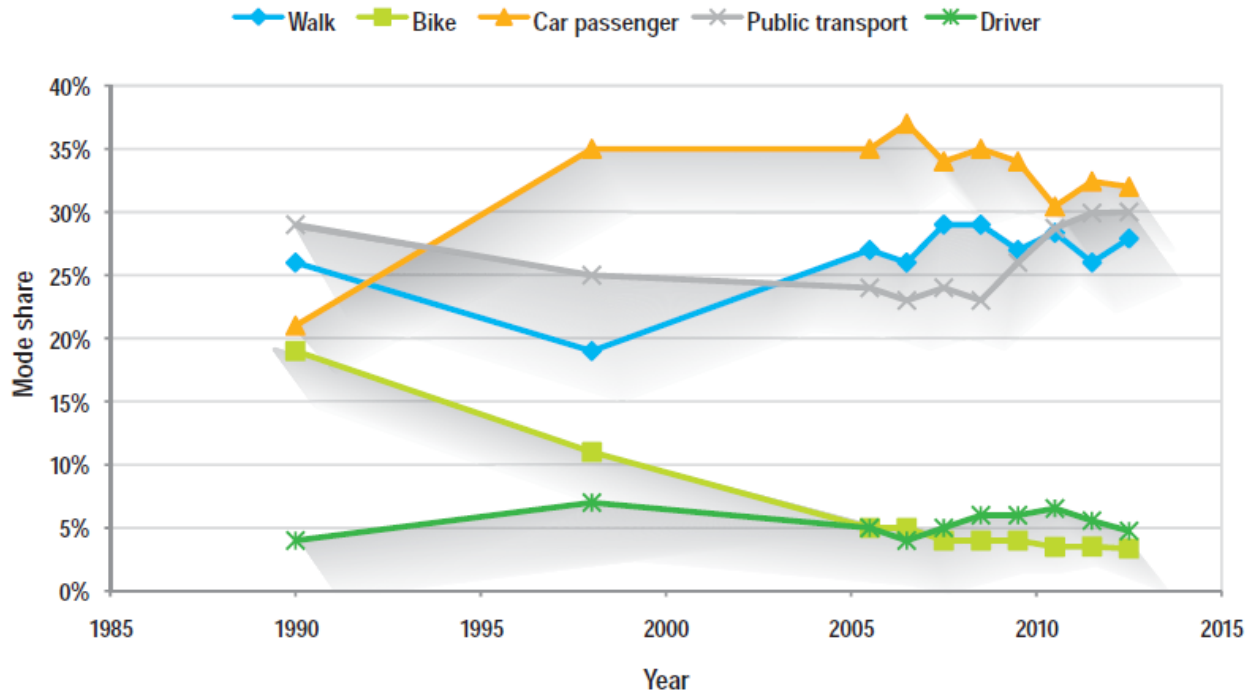
Active Living Laboratory
University of Otago

Email: sandra.mandic@otago.ac.nz

Transport Knowledge Conference | 15 Nov 2018

Transport to School in NZ: 1989-2014

Figure 17: Travel to school – mode share – ages 13–17 years



Note: After 2004 data points are based on the average of 4 years of data per point.

1989/1990

Travel to school:

21% driven
26% walking
19% cycling

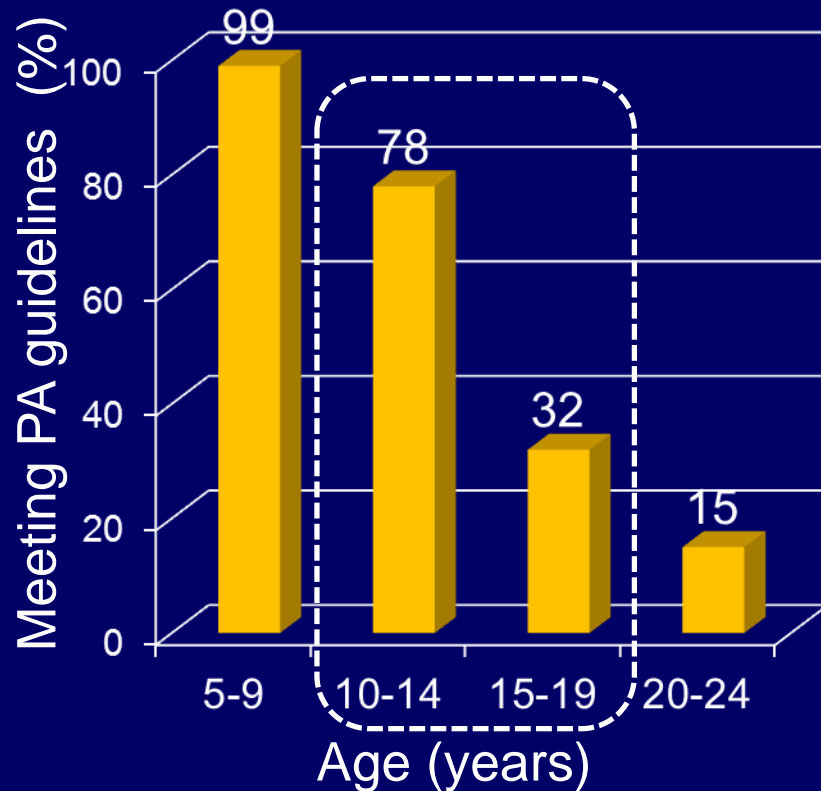
2010-2014

Travel to school:

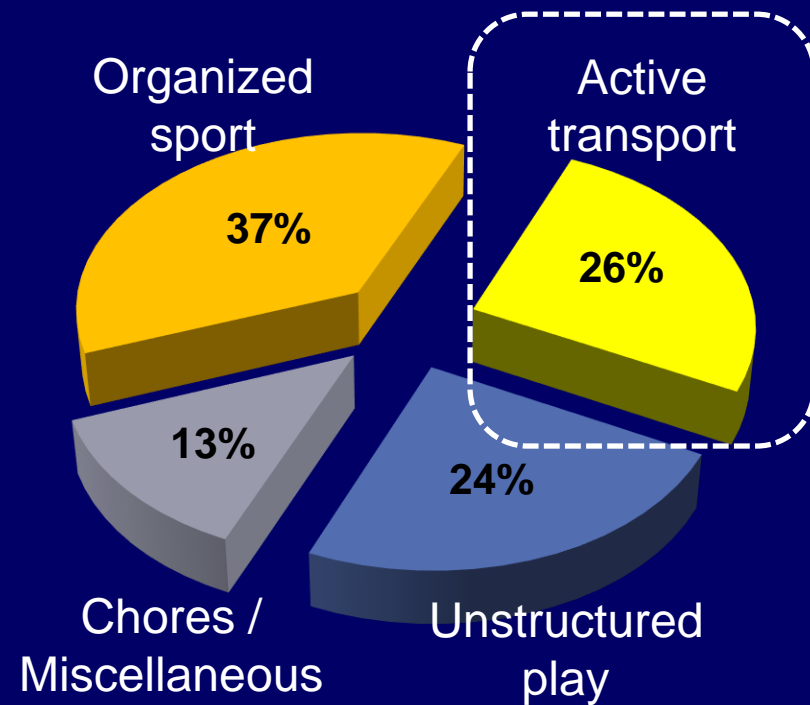
32% driven
27% walking
3% cycling

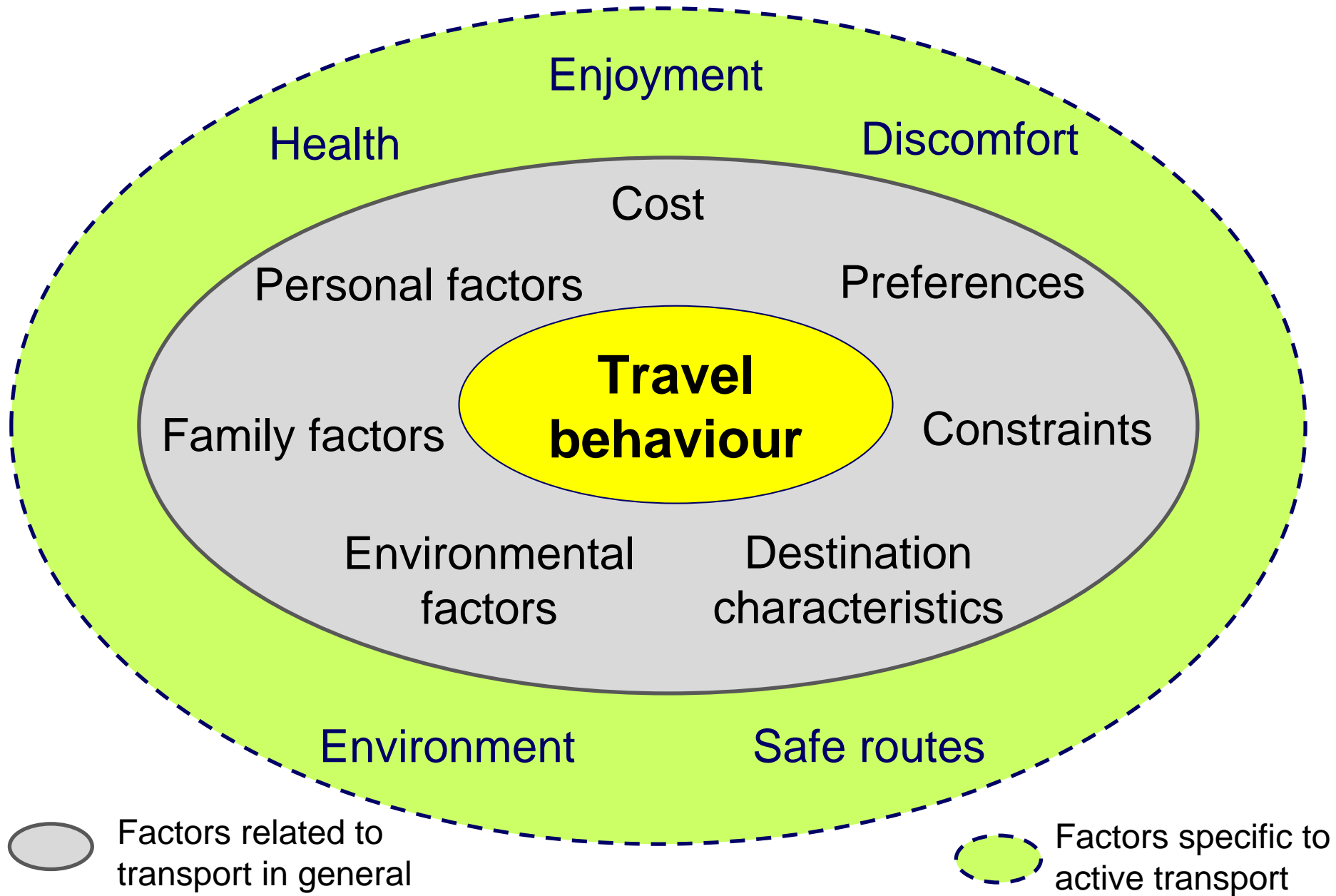
Ministry of Transport. (2015). 25 years of New Zealand travel: New Zealand household travel 1989–2014. Wellington: Ministry of Transport. (page 30)

Physical Activity in Children and Adolescents



Moderate-to-vigorous PA in 10- to 13-year old children





Built Environment and Transport Behaviour

Activities: What people spend the majority of their time doing

LEISURE

Recreation/Entertainment



HOME

Domestic Activities



TRANSPORTATION

Commuting



OCCUPATION

Working or Studying



Built Environment Settings: That support physical activity in these areas

1 OPEN SPACES/
PARKS



2 URBAN DESIGN/
LAND USE



3 TRANSPORTATION



4 SCHOOLS



5 BUILDINGS/
WORKPLACES



Built Environment and Transportation

- Walkable community design
 - Density
 - Connected streets
 - Mixed land uses
 - Access to transit
- Pedestrian & bicycle facilities
 - Access; Connectivity
 - Design; Quality; Safety
- Perceived environment: accessibility and convenience



Sallis SF et al. *Circulation*. 2012;125:729-737

<http://www.houselogic.com/home-advice/green-living/make-my-neighborhood-more-walkable/>
http://switchboard.nrdc.org/blogs/kbenfield/how_communities_can_support_wa.html

BEATS Research Programme at Otago



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BEATS Study

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Information for researchers and policy makers
Research team
Publications
Prospective graduate students
Volunteers
News and events
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Haere mai, welcome to the BEATS Study

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*Built Environment and
Active Transport to School*



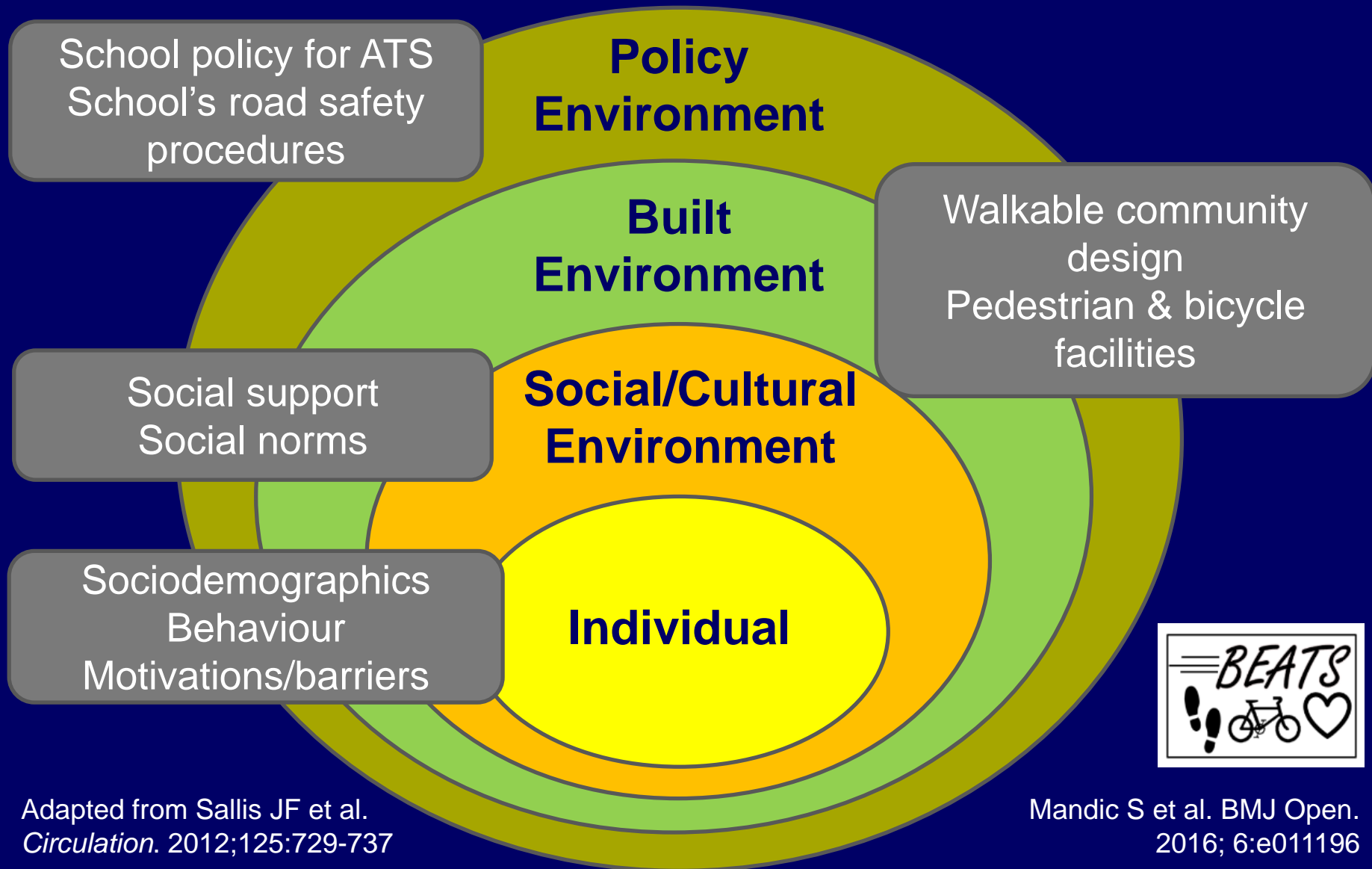
Built Environment and Active Transport to School (BEATS) Study

- **Investigates:**
 - transport to school habits,
 - the neighbourhood environment and
 - physical activity habits
- in Otago adolescents.**

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BEATS Research Programme Framework: Ecological Model for Active Transport



Adapted from Sallis JF et al.
Circulation. 2012;125:729-737

Mandic S et al. *BMJ Open*.
2016; 6:e011196

Research Methodology



Adolescents & Parents

Survey



Maps; GIS Analysis



Anthropometry



Physical Activity



School bag weight Adolescents



Focus groups

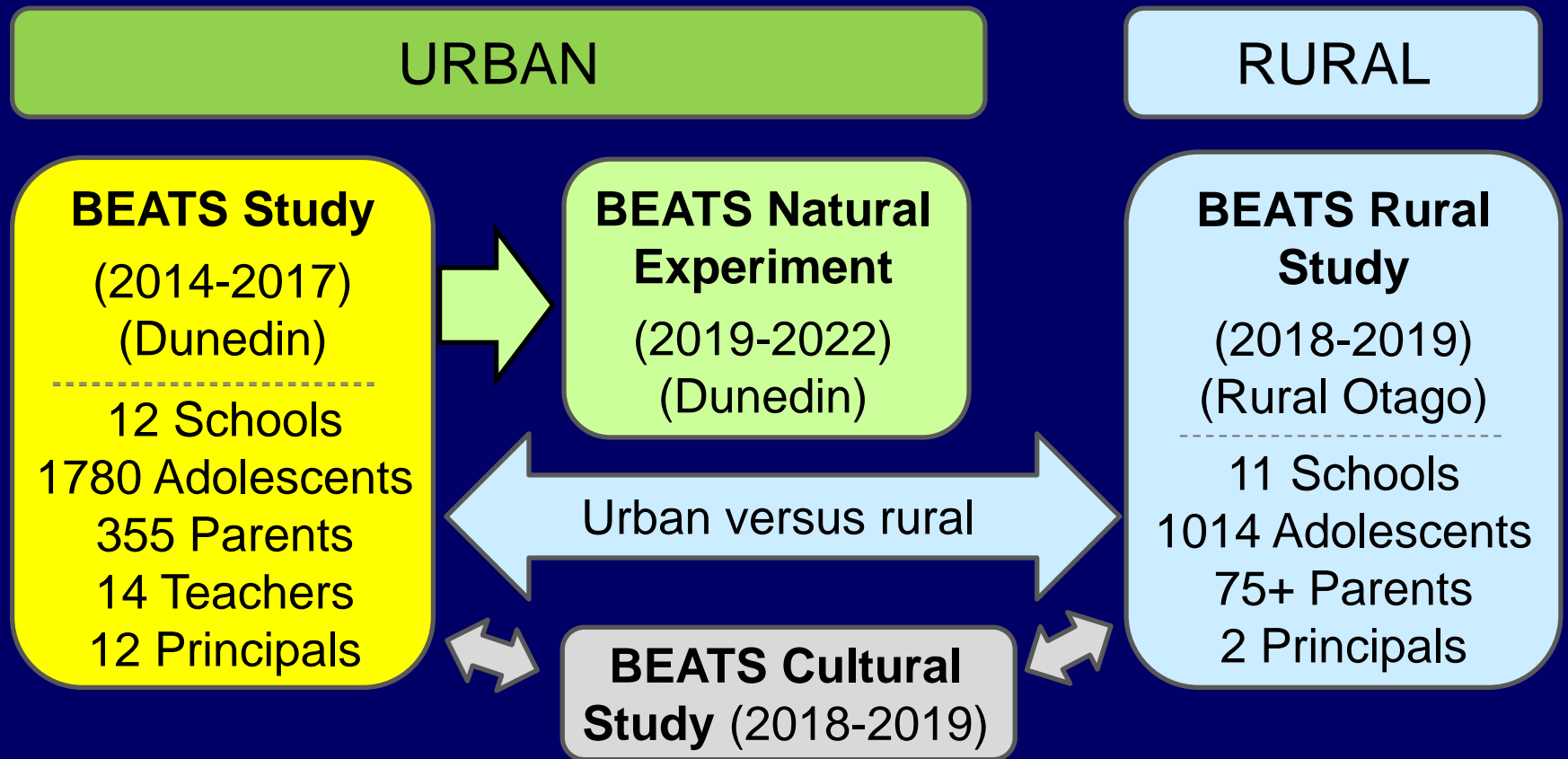
Adolescents, Parents, Teachers



Interviews

School Principals

BEATS Research Programme (2013-2022)



Disciplines &
impact areas:

**Exercise
Science**

**Public
Health**

Transport

**Built
Environment**

Education

Partnerships:

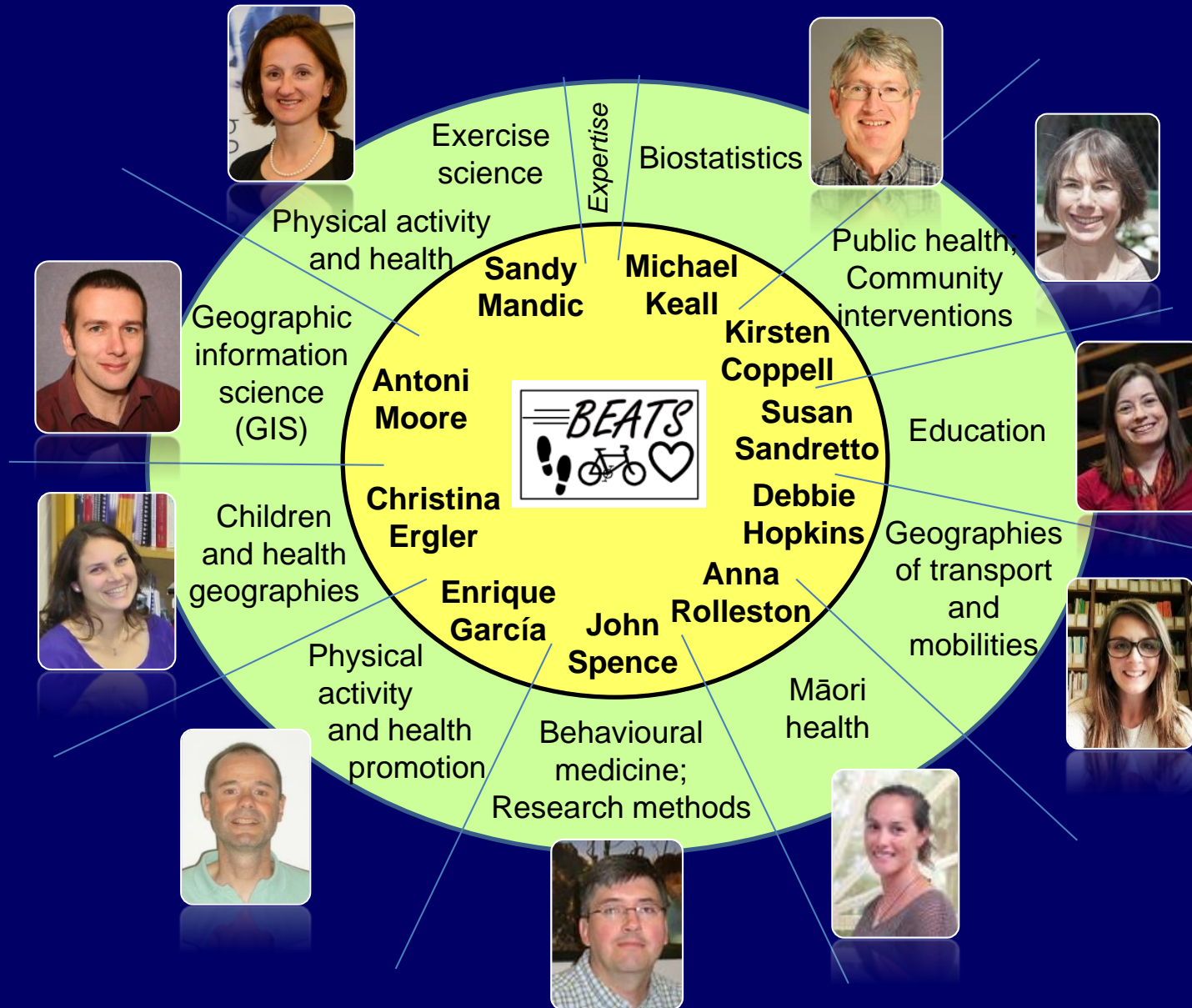
Academia

City Council

Schools

Community

BEATS Team 2018: Multidisciplinary Expertise



Advisory Board Members:

Gavin Kidd,
Gordon Wilson
(Dunedin Secondary Schools' Partnership)

Nick Sargent
(Dunedin City Council)

Greame Rice
(NZ Transport Agency)

Janet Stephenson
(Centre for Sustainability)

Frank Edwards
(Māori) and **Finau Taungapeau**
(Pacific) community representatives

Comprehensive Dissemination of Research Findings

BEATS Research Programme Outputs to Date



**Journal
articles**

14 Published
2 in review
10 in preparation
1 Book chapter



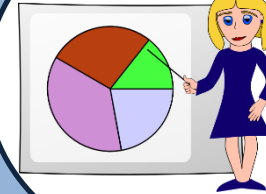
**Conference
abstracts**

18 International
15 National
31 Local



**Technical
Reports**

24 Published
(3 progress
reports)



Presentations

2 Keynotes
1 Invited
21 Academic
19 Non-academic



Symposia

3 Local
(2014/2016/2018)
2 International
(2017/2019)

Last updated: November 2018

BEATS Study

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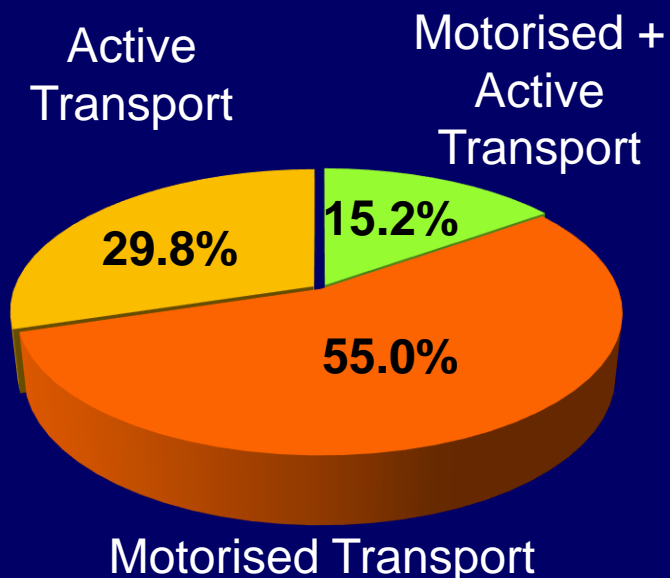


BEATS Research Programme Findings (2018)



Transport to School Habits across Otago

Total sample
(n=2,656)



Motorised Transport

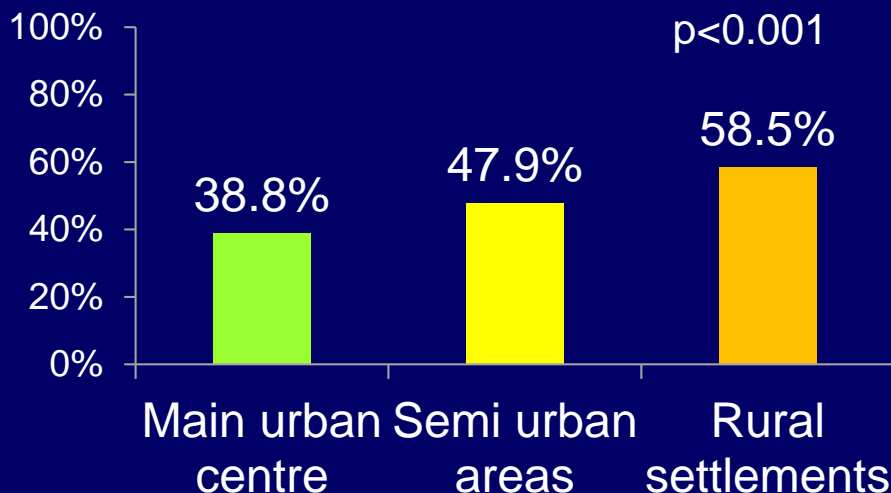
No significant difference across
urbanisation settings

78.9% had a bicycle at home
75.8% had 2+ vehicles at home

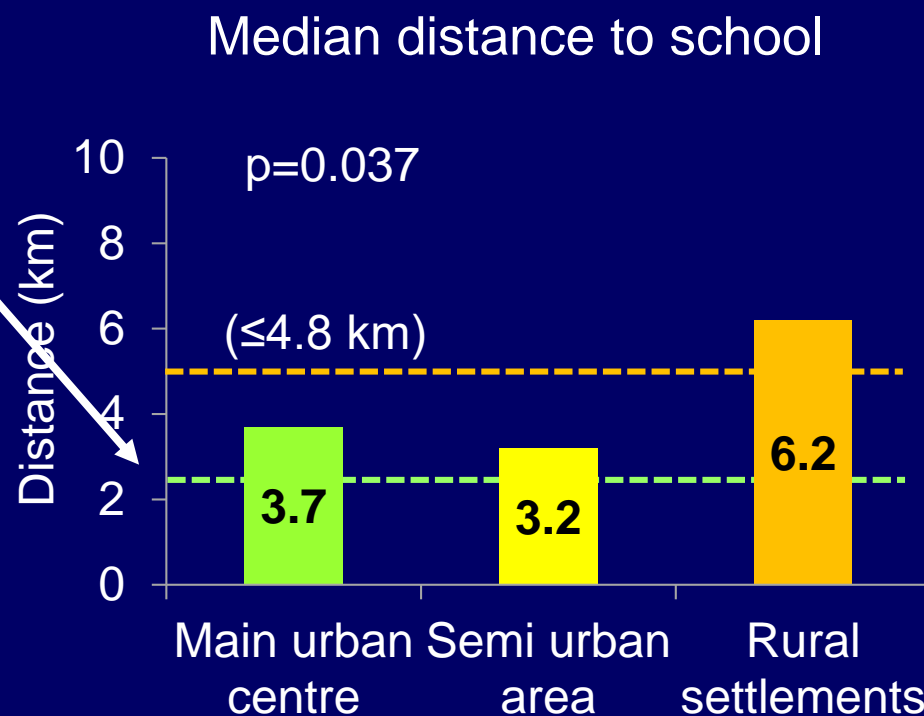
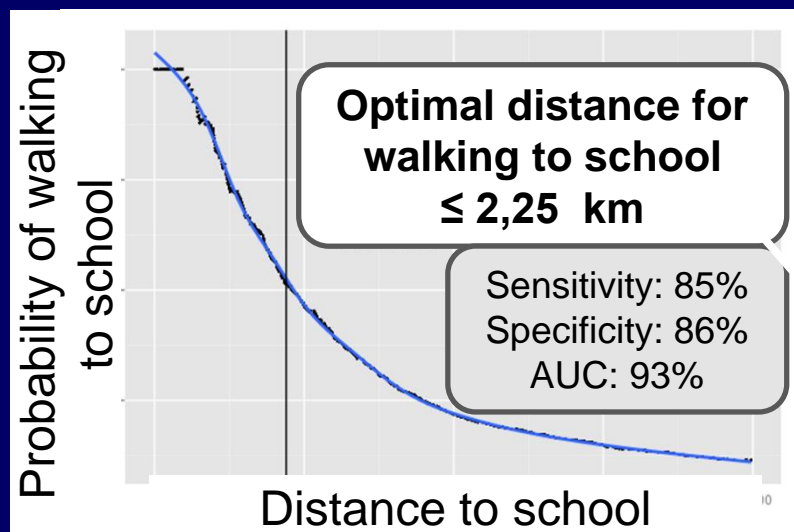
89.9% liked how they travel
to school

Active transport to school

Among adolescents ineligible for
subsidised school bus
(living within 4.8 km from school)



Transport to School Habits across Otago



89.1%



11.8%

Source: BEATS Study and
BEATS Rural Study (n=2,656)

Pocock et al. Health and Place (in press)

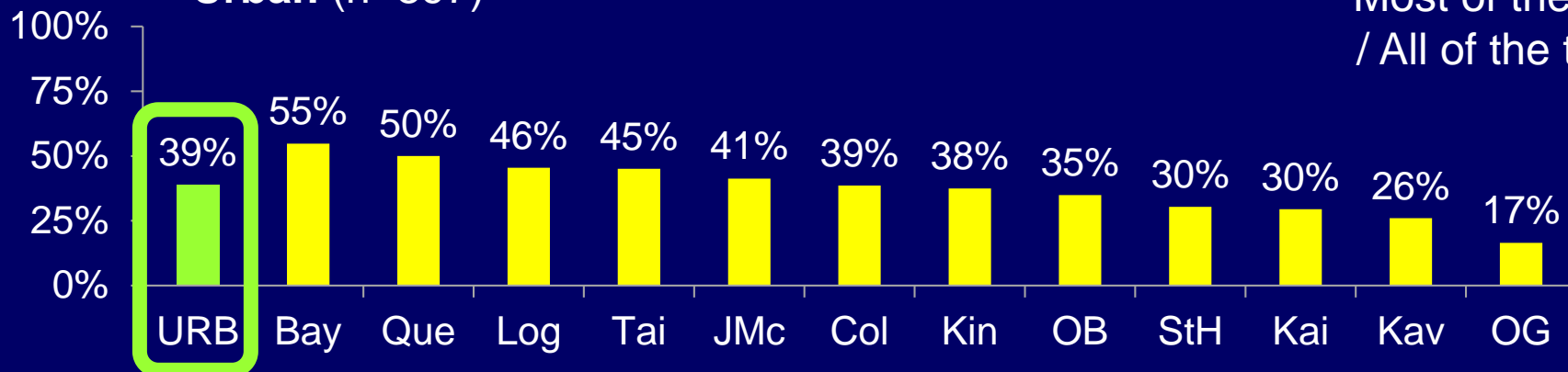
Significant difference across
urbanisation settings

Rates of Active Transport to School

(Living ≤ 4.8 from school; boarders excluded)

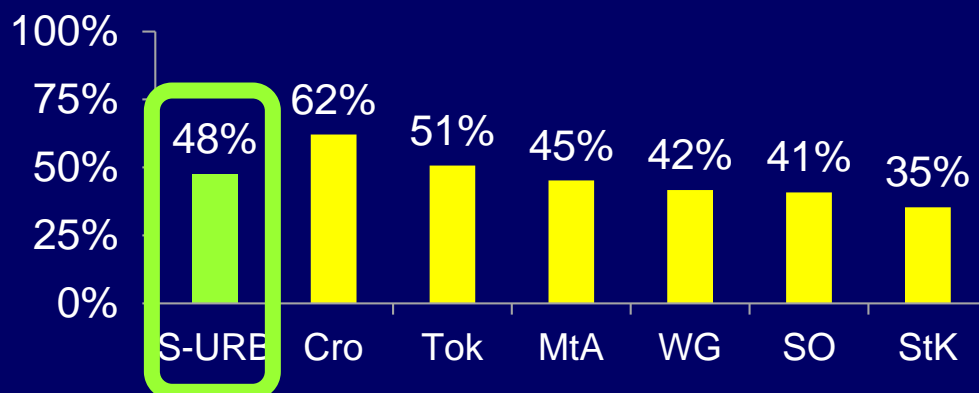


Urban (n=897)

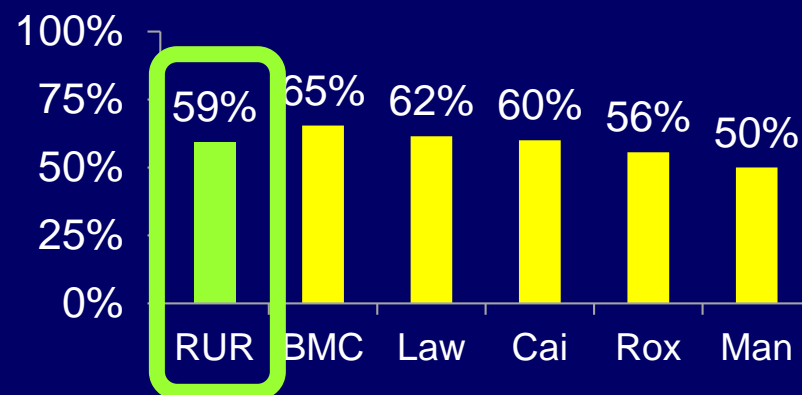


*Most of the time
/ All of the time

Semi-urban (n=457)



Rural (n=81)

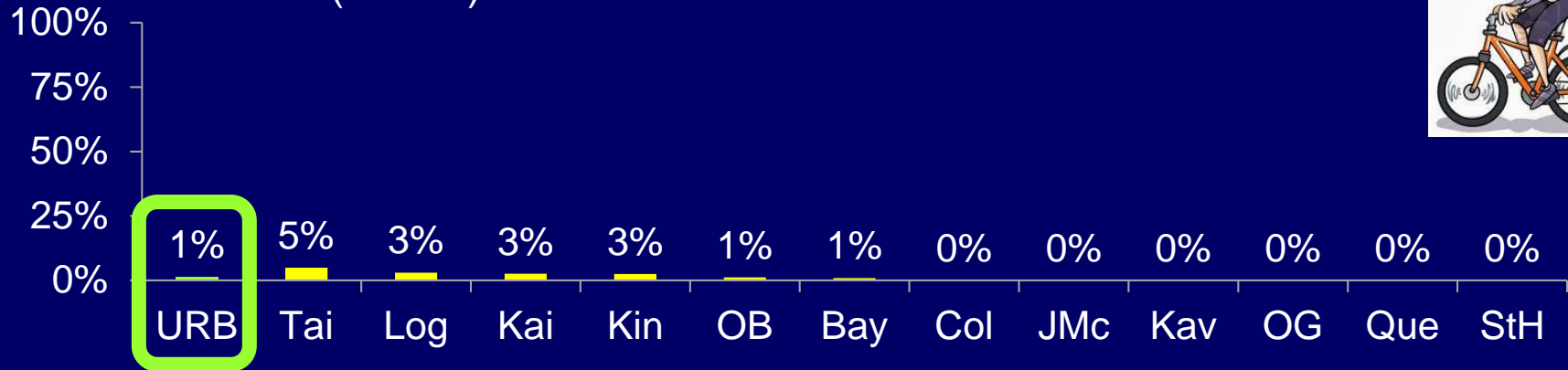


Rates of Cycling to School

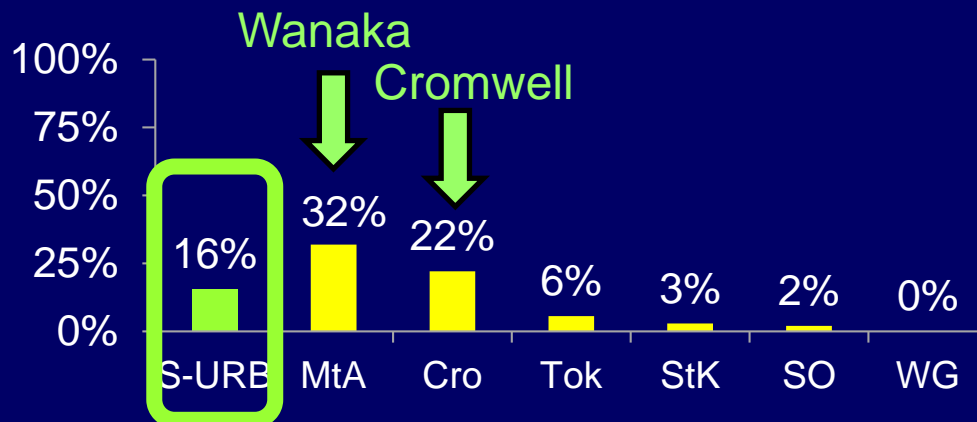
(living ≤ 4.8 from school; borders and mixed modes excluded)



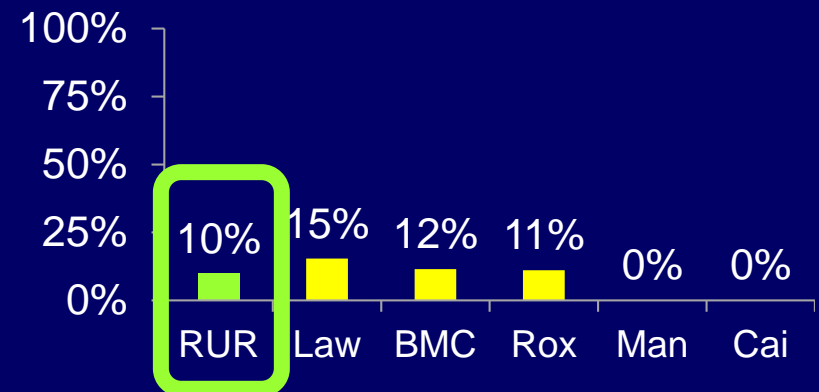
Urban (n=897)



Semi-urban (n=457)



Rural (n=81)



Transport to School and Physical Activity in Dunedin Adolescents



Chiew Ching
Kek



Physical Activity

Guidelines:
≥60 min per day

Average:
4.2 ± 2.1 days/week

17.9%
met guidelines

n=1,300
(self-reported data)



47.9%

Active
Transport

n=73



46.4%

Motorised +
Active
Transport

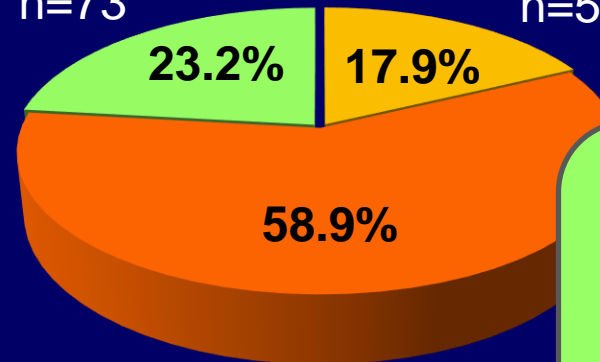
n=56



33.5%

Motorised
Transport

n=185



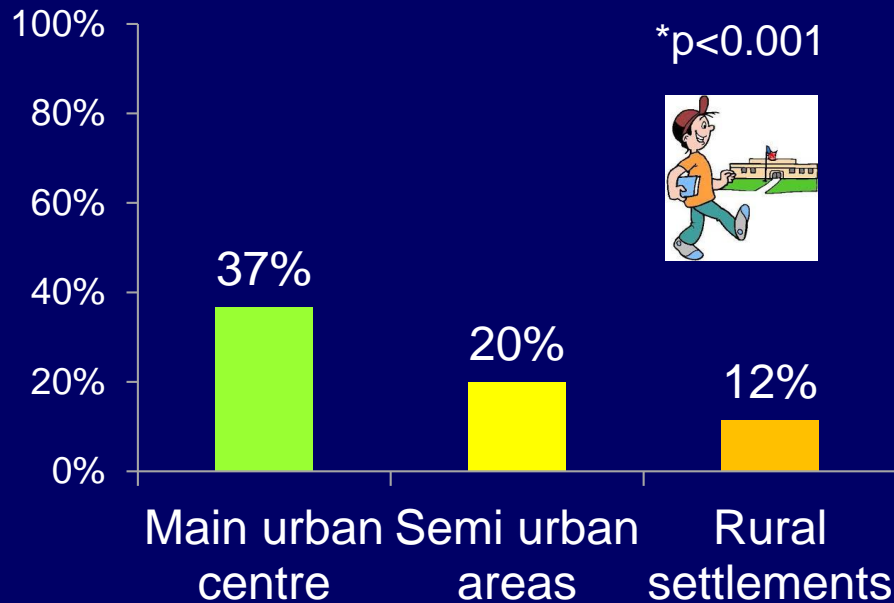
AT and AT+MT
accumulated
more physical
activity during
school commute
than MT

(n=314)

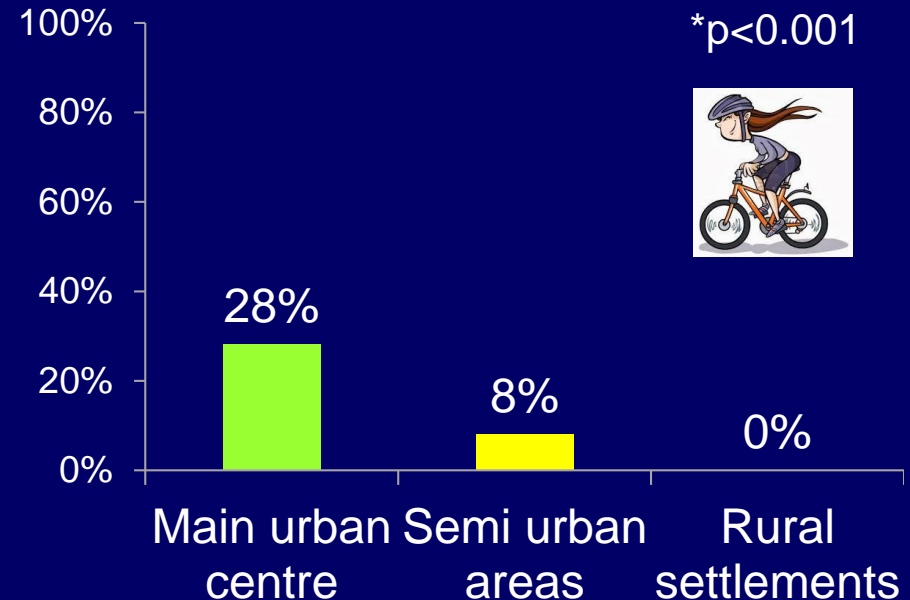
Perceptions of Distance to School

(among adolescents living ≤ 4.8 km from school)

It is too far
to walk to school.

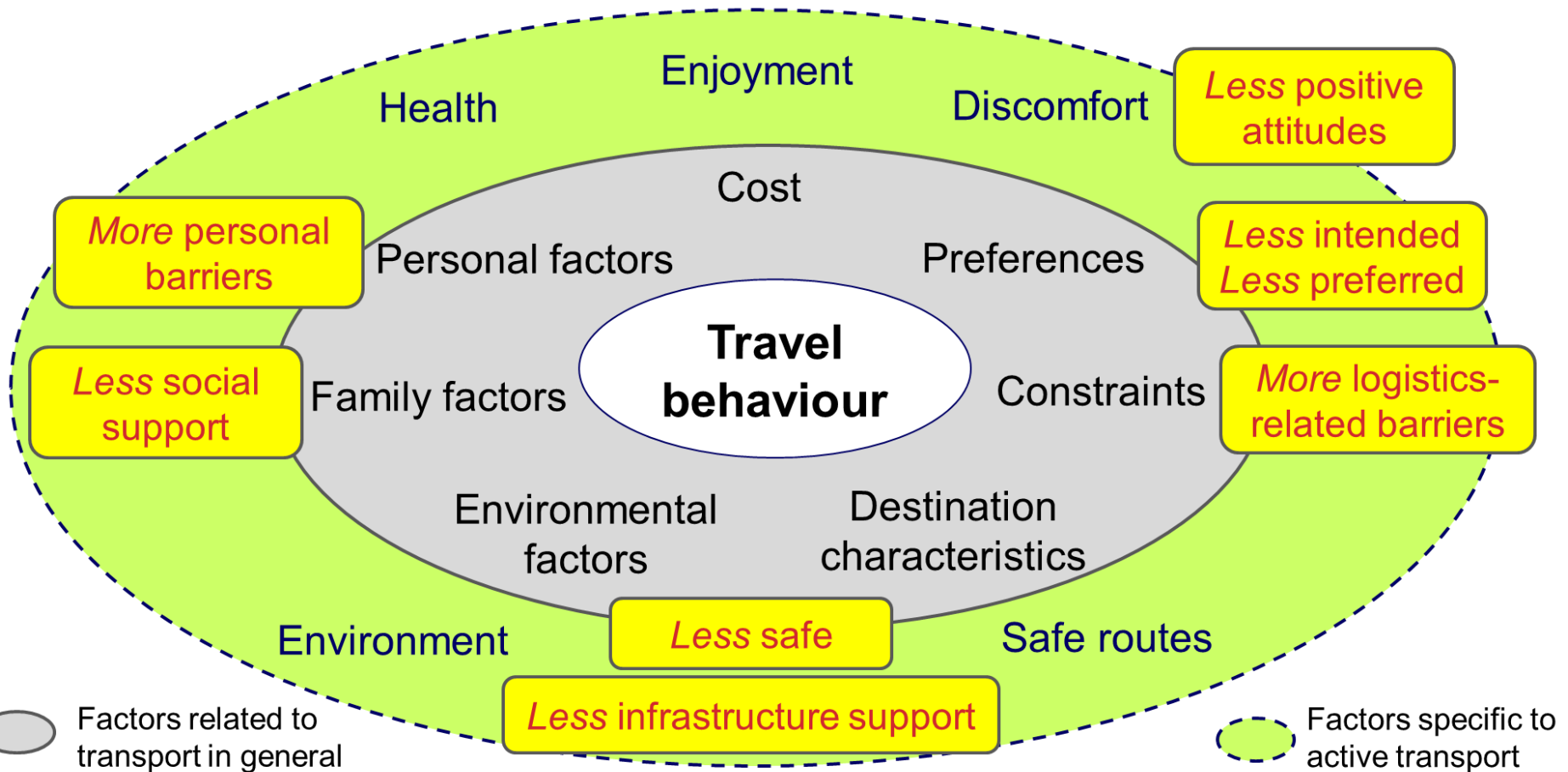


It is too far
to cycle to school.



Adolescents' Perspective

Cycling versus Walking to School



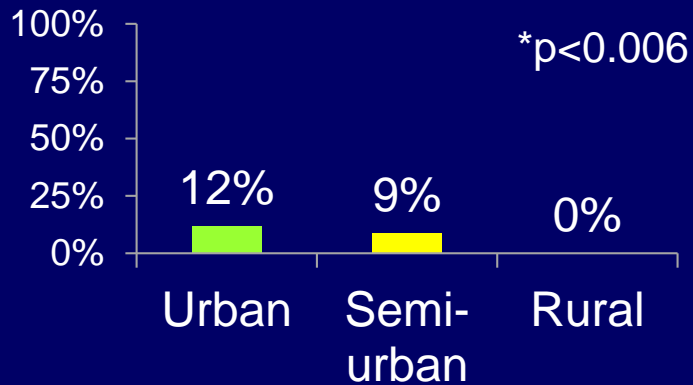
Perceptions of Safety

(among adolescents living ≤ 4.8 km from school)

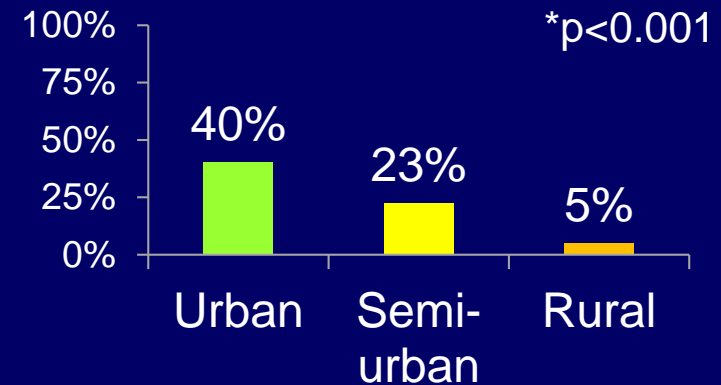


It is unsafe to walk to school.

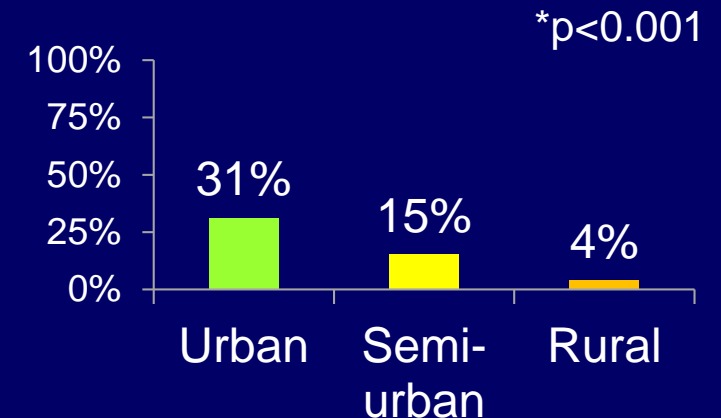
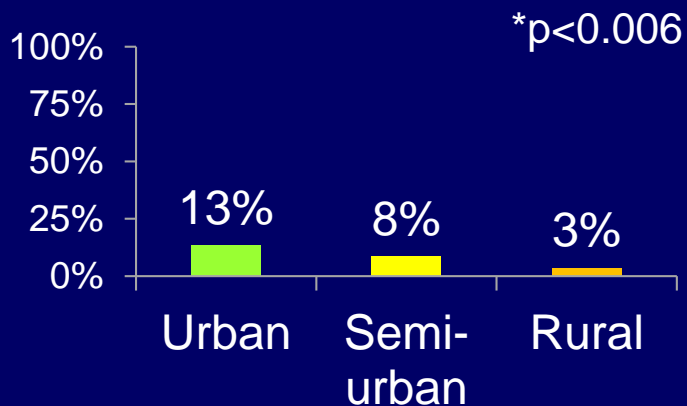
Adolescents' concerns



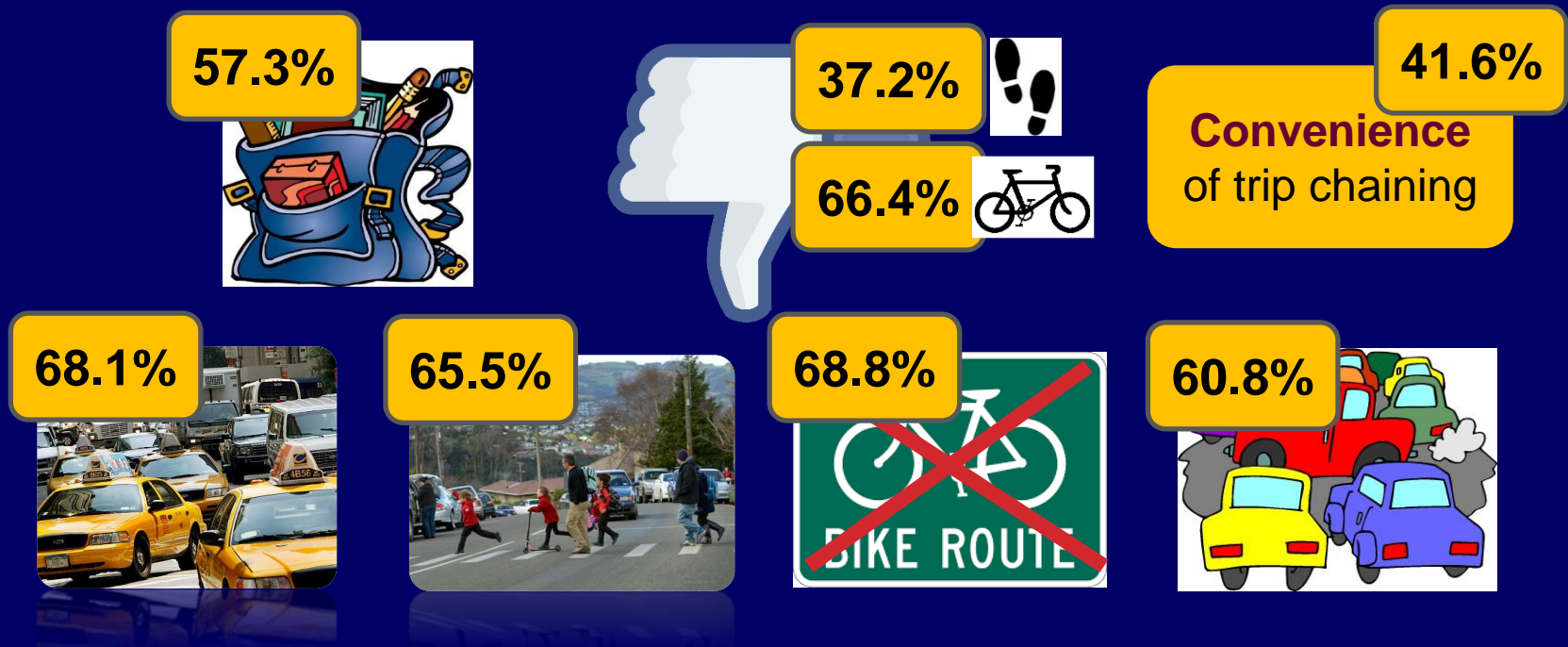
It is unsafe to cycle to school.



Parental concerns
(reported by adolescents)



Parental Barriers to Active Transport to School



Fewer barriers for walking compared to cycling

Future interventions should address parental barriers for active transport to school (especially for cycling).

Perceptions of Cycling to School (From Student and Parental Focus Groups)



Dr Debbie
Hopkins
(Oxford)

- Perceived safety:
 - A complex range of factors including:
 - Features and perceptions of the built environment
 - Traffic safety (including behaviours of other road users)
 - Previous cycling experiences (including accidents)
 - Adolescents' cycling skills and on-road experiences
- Implicit messages
- Social norms



Enablers of Cycling to School: Adolescents' Perspective

n=764
(non-boarders;
within $\leq 4\text{km}$)

41.4%



**Cycle-friendly
uniform**

40.1%



**Safer bike storage
at school**

36.4%



Slower traffic

26.2%



**Bus bike racks
free of charge**

32.7%



Bike ownership

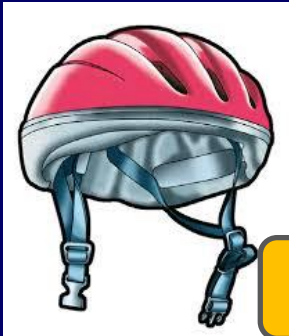
22.1%



**Cycling without
a helmet**

Mandic S et al. Journal of Transportation
and Health. 2017: 4:294-304.

Cycle Helmet Legislation as a Barrier to Cycling to School



22%

Adolescents would cycle to school more if helmet use was not mandatory

Significant factors:

- Distance to school
- Māori and other ethnicities (vs. NZ European)
- Cycling to school is 'not cool'
- Cycling often with friends
- Boring route to school
- Cycling as a great way to exercise (+)

Recommendations:

Design educational interventions to influence adolescents' attitudes towards the helmet use.

- Could be offered as a part of cycle skills training

School Bag Weight as a Barrier



School bag perceived
as a barrier to active
transport to school

✓ 68% of parents

Adolescents:

✓ 58% for walking

✓ 66% for cycling

Full bag weight:
5.6 kg (\pm 2.1 kg)

9.3% (\pm 3.9%)
of adolescents'
body weight

37.9%

**Above
10%
of body
weight**

Active transport users were
less likely to report heavy
school bags

Actual school bag weights
did not differ by mode of
transport to school.



Significance

BEATS Study

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Active Transport to School



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Generating important information for key stakeholders for planning future school-, neighbourhood- and city/town-wide built environment changes to encourage active transport to school

Understanding influences of multiple factors will **enable the scientific community, policy makers, regional planners, and health promoters to address barriers to active transport to school**

If effective, population level initiatives aimed to ↑ physical activity across all groups such as **pedestrian and/or cycling infrastructure construction/improvements** will contribute to **improving health and wellbeing of communities**

Involvement of the key stakeholders will facilitate the generation of **usable data**, relevant to the **local context** and **generalisable** to other areas, and the **incorporation of new knowledge** into policy and future initiatives

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Join us for...

The Active Living and Environment Symposium 2019

Dunedin | 13-15 February 2019

Sign up for...

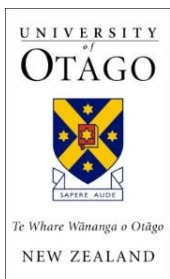
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Sign up: <https://goo.gl/jtqdAo>

Current and past issues available at our laboratory website:

<https://www.otago.ac.nz/active-living/research/publications/index.html>

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and/or sponsoring our work**



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Thank you!

