



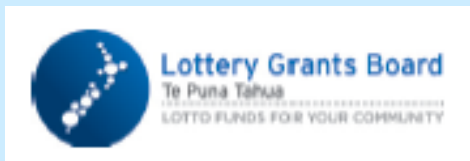
Adolescents' School Travel, Walking to School and the COVID-19 Pandemic

Sandra Mandic*, Enrique García Bengoechea, Kirsten J. Coppel, Michael Keall, Melody Smith, Debbie Hopkins, Susan Sandretto, Gordon Wilson, Gavin Kidd, Charlotte Flaherty, Jennifer S Mindell, Janet Stephenson, Kimberley King, Kaisa Kentala, Anna Rolleston, John C. Spence.

Acknowledgments



2013-2023



The journey of 4,000+ days...

...

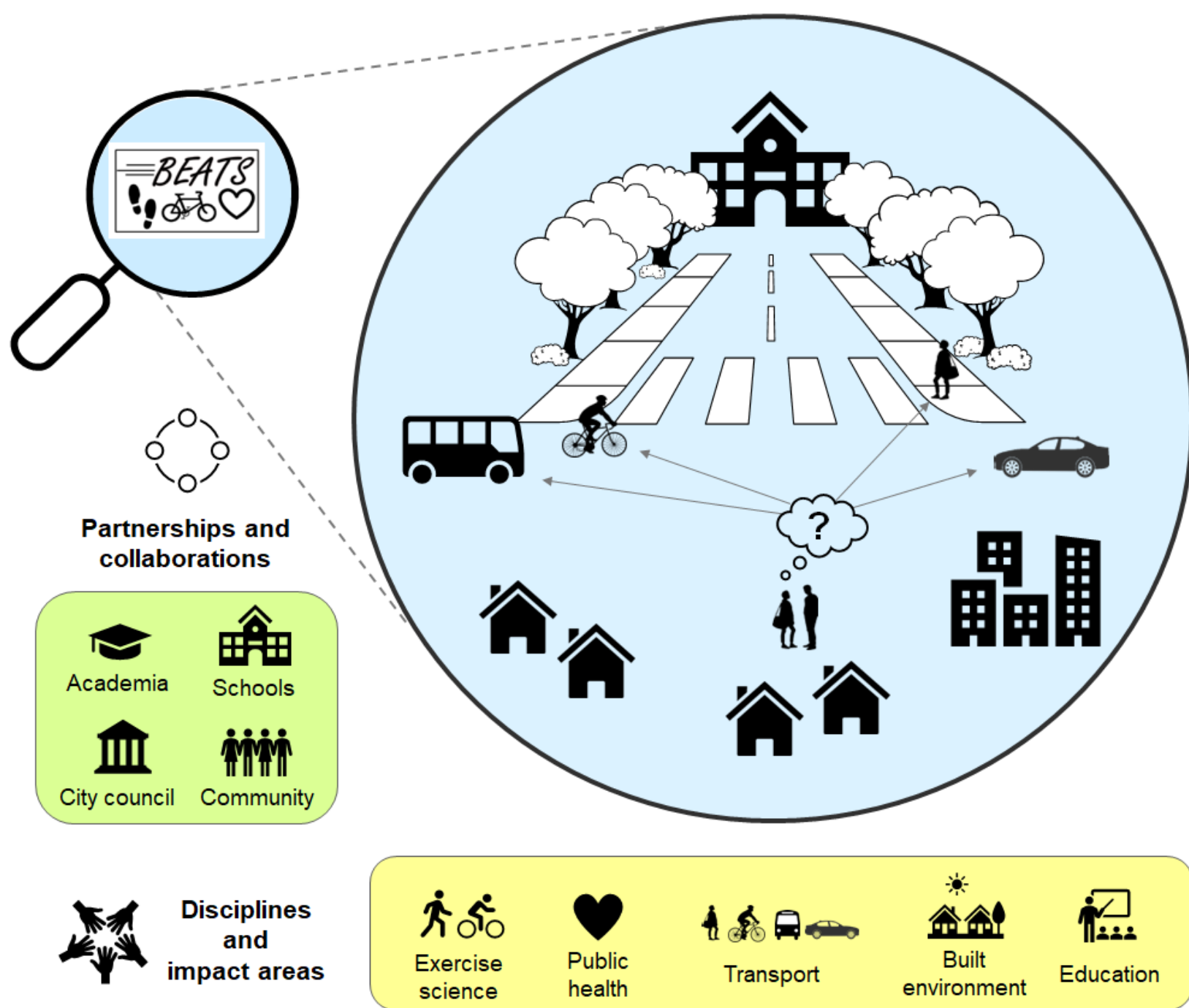
BEATS Research Programme

(2013-2023)

An interdisciplinary and multi-sector research programme founded as a partnership between academia, schools, local government and the wider community

BEATS =
Built Environment and
Active Transport to School

<https://agileresearch.nz/beats/>





Reasons for the BEATS Research

Health

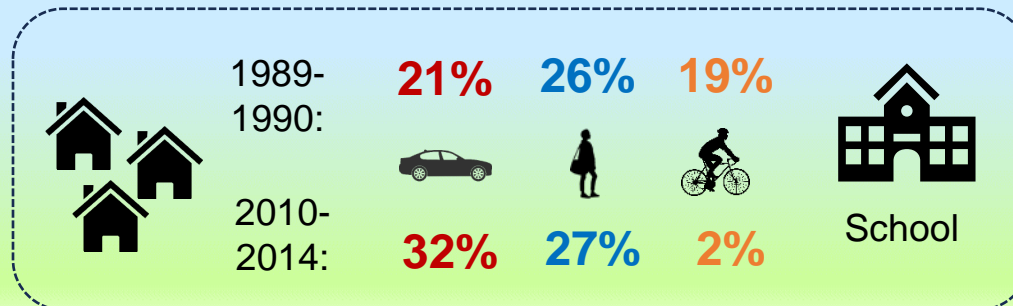
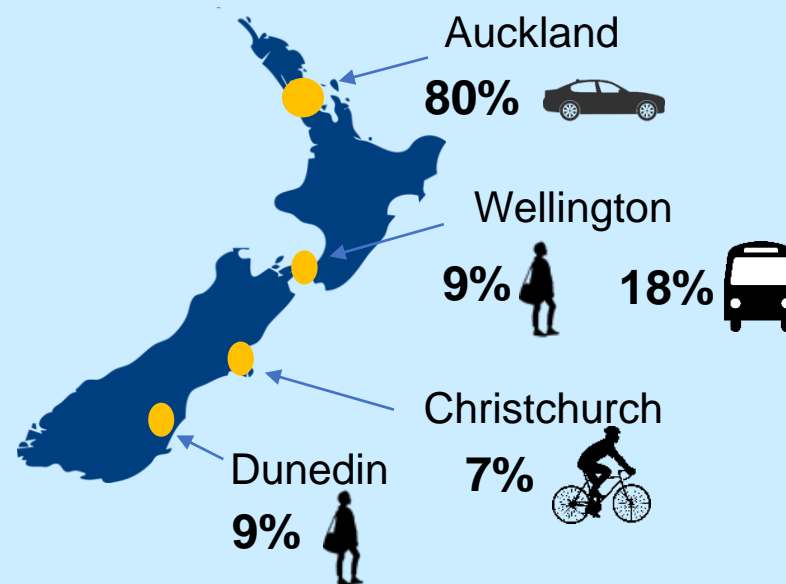
C+
Overall physical activity

D
Active transport

2022
Aotearoa New Zealand Physical Activity Report Card for Children & Youth

Wilson OWA, et al. Journal of Exercise Science & Fitness. 2023; 21:58-66

Transport



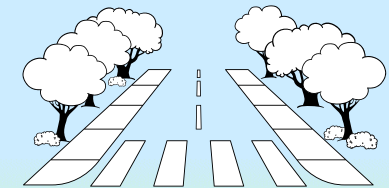
Ministry of Transport. (2015). 25 years of New Zealand travel: New Zealand household travel 1989–2014. Wellington: Ministry of Transport.

Local Context

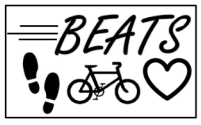
In Dunedin, New Zealand...



City's needs to improve safety of walking and cycling around city centre schools





Extensive city-wide cycling infrastructure planned

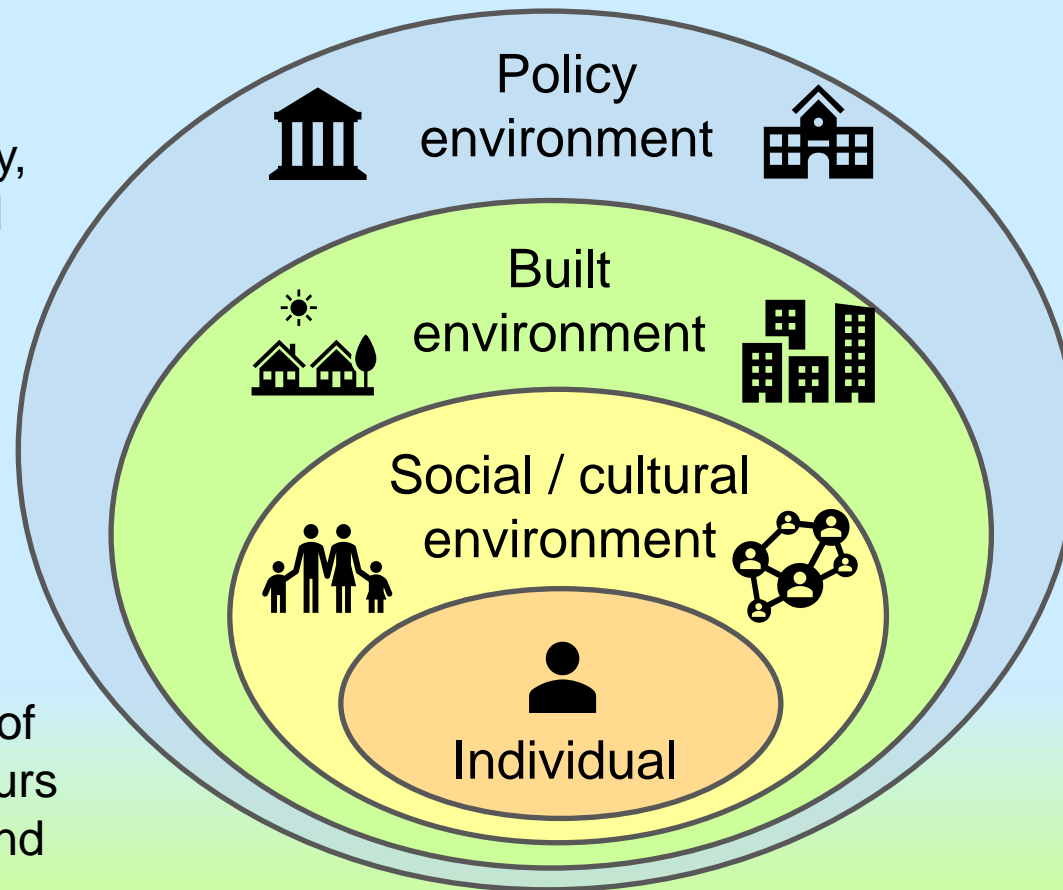


BEATS Research Foundations

Ecological model for active transport


A range of individual, family, social, environmental and policy factors has effects on how adolescents travel to school


Examining multiple levels of influence on travel behaviours requires interdisciplinary and cross-sector approach



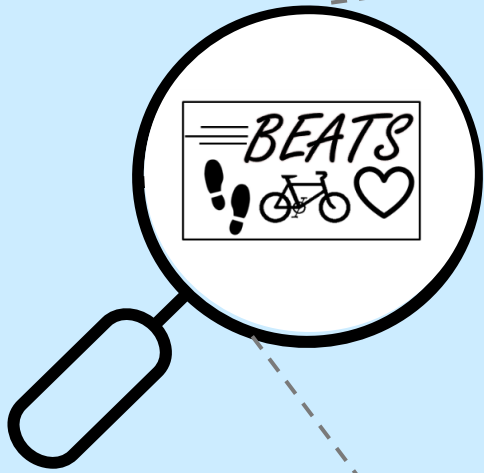
Dr Sandra Mandic, PhD
BEATS Founder and
Principal Investigator



The programme began as a pilot research project with a **NZD \$5,000** research grant in 2013

Adapted from Sallis JF et al. *Circulation*. 2012;125:729-737
and Mandic S et al. *BMJ Open*. 2016; 6:e011196

2013-2023



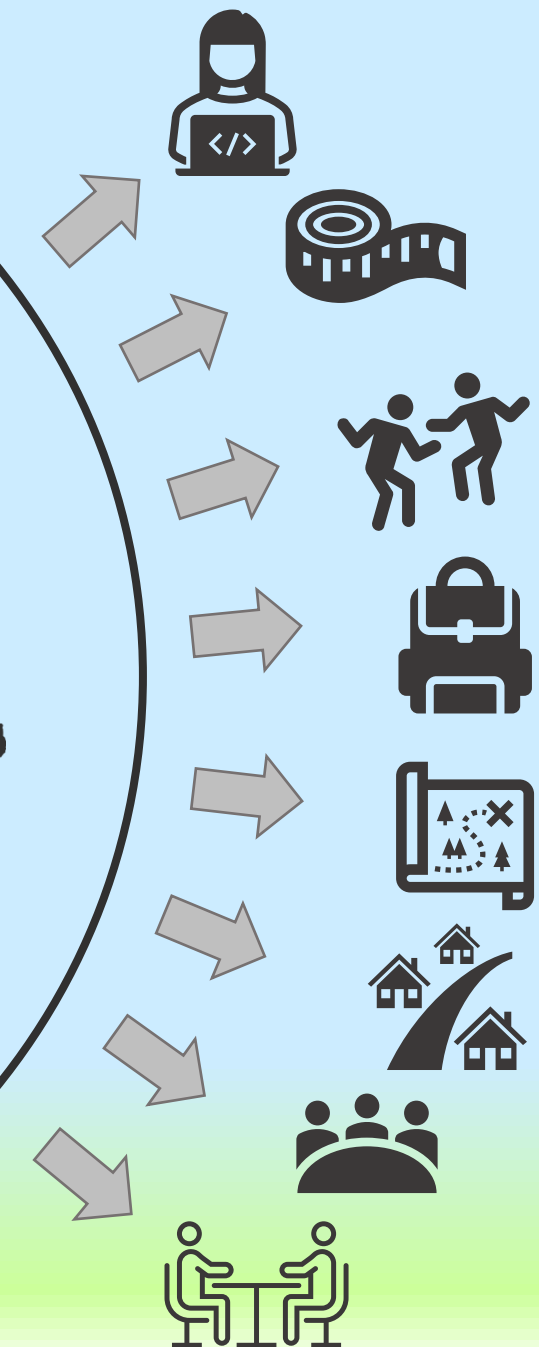
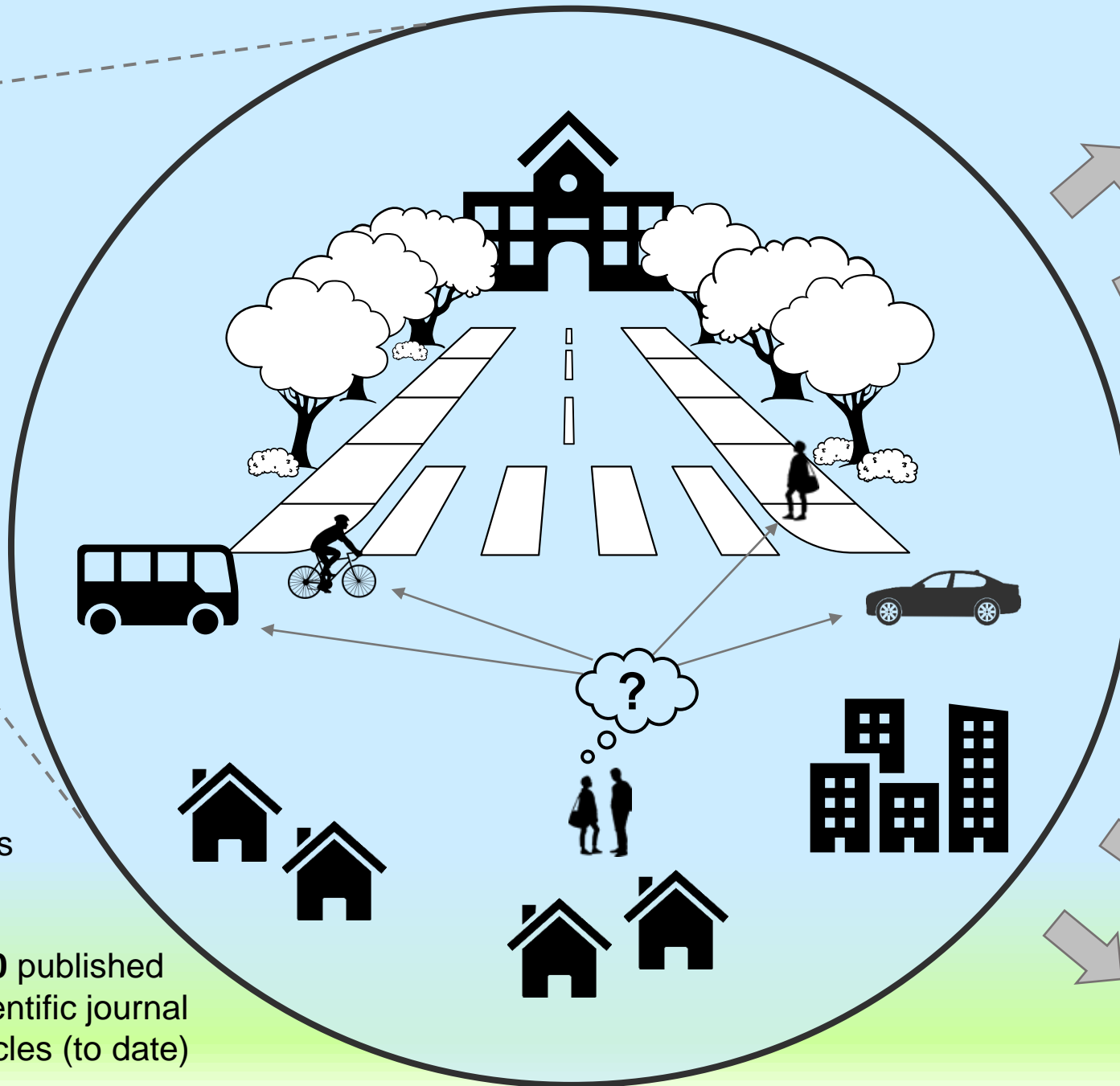
Dunedin and
the Otago Region,
New Zealand

Engaged 4,484
adolescents

Engaged
23 schools

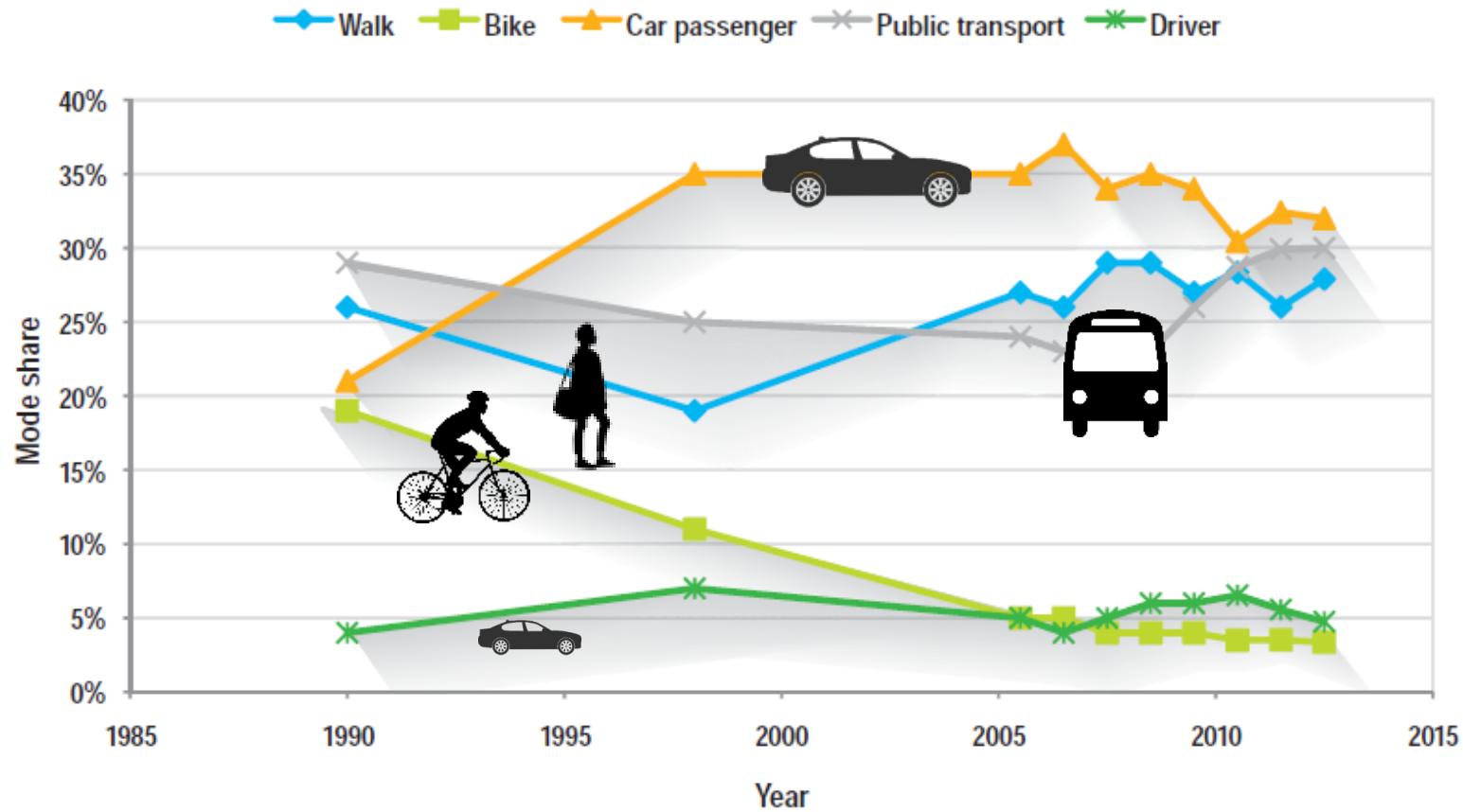
NZD \$1.5 million
in research
funding

40 published
scientific journal
articles (to date)



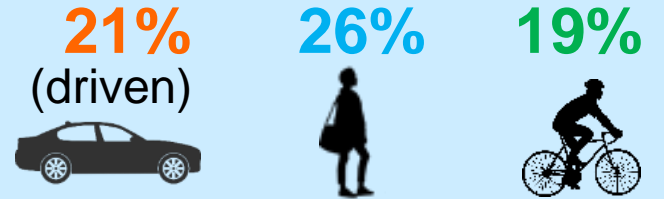
Transport to High Schools in New Zealand

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

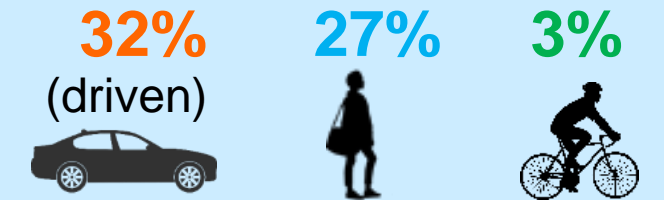


Note: After 2004 data points are based on the average of 4 years of data per point.

1989/1990



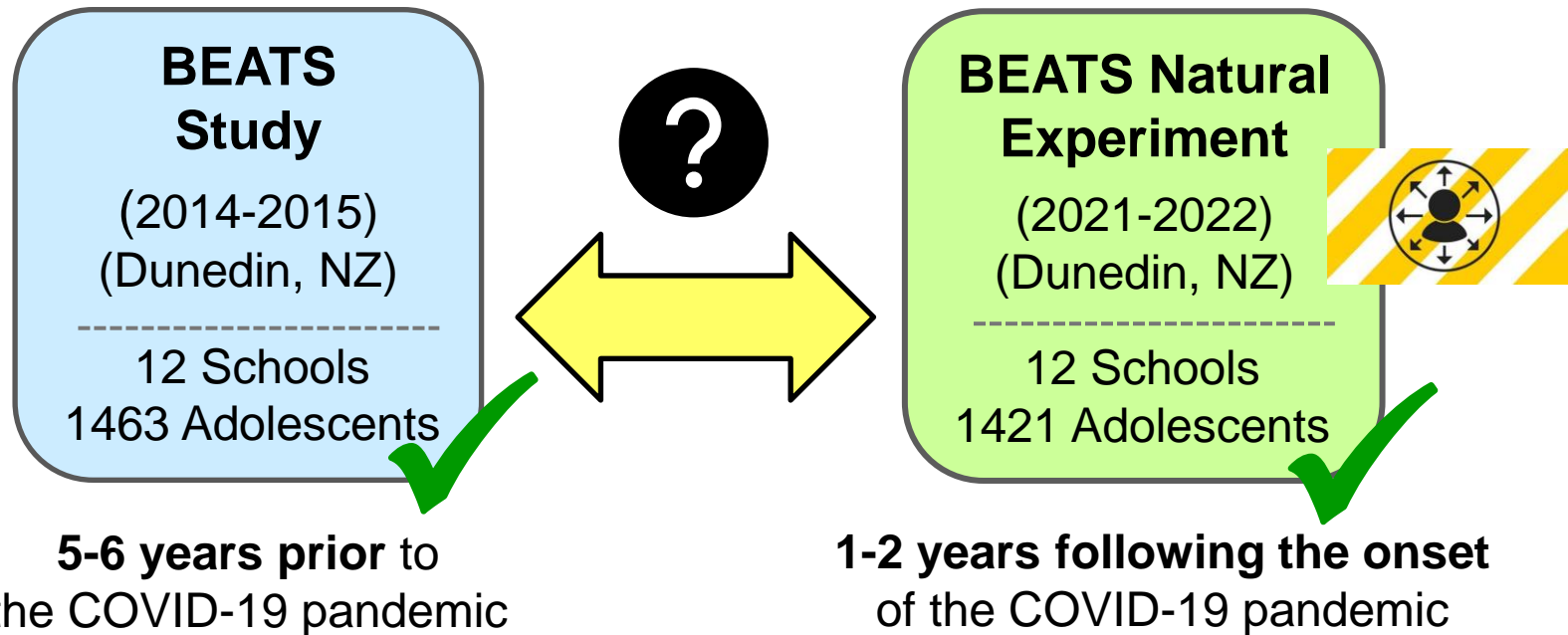
2010-2014



2021-2022



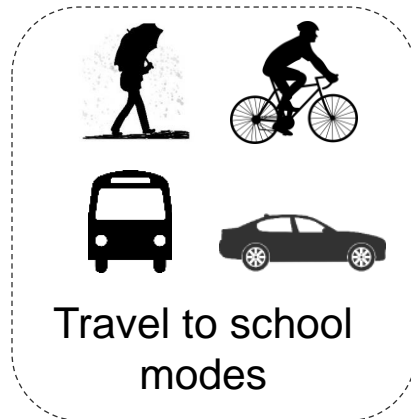
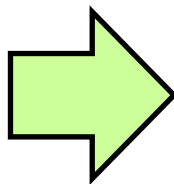
BEATS Research Programme (2013-2023)



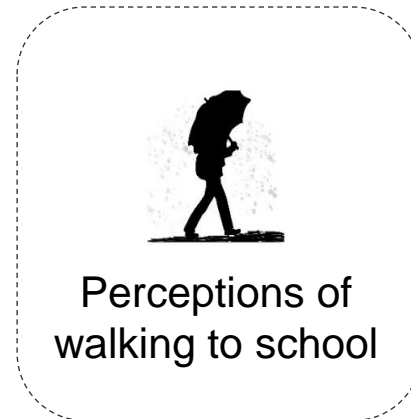
Methods:



Online survey during school time



Travel to school modes



Perceptions of walking to school



School Recruitment for BEATS Study and BEATS Natural Experiment



Mr Gordon Wilson, MNZM



Otago Girls' High School



JOHN MCGLASHAN COLLEGE

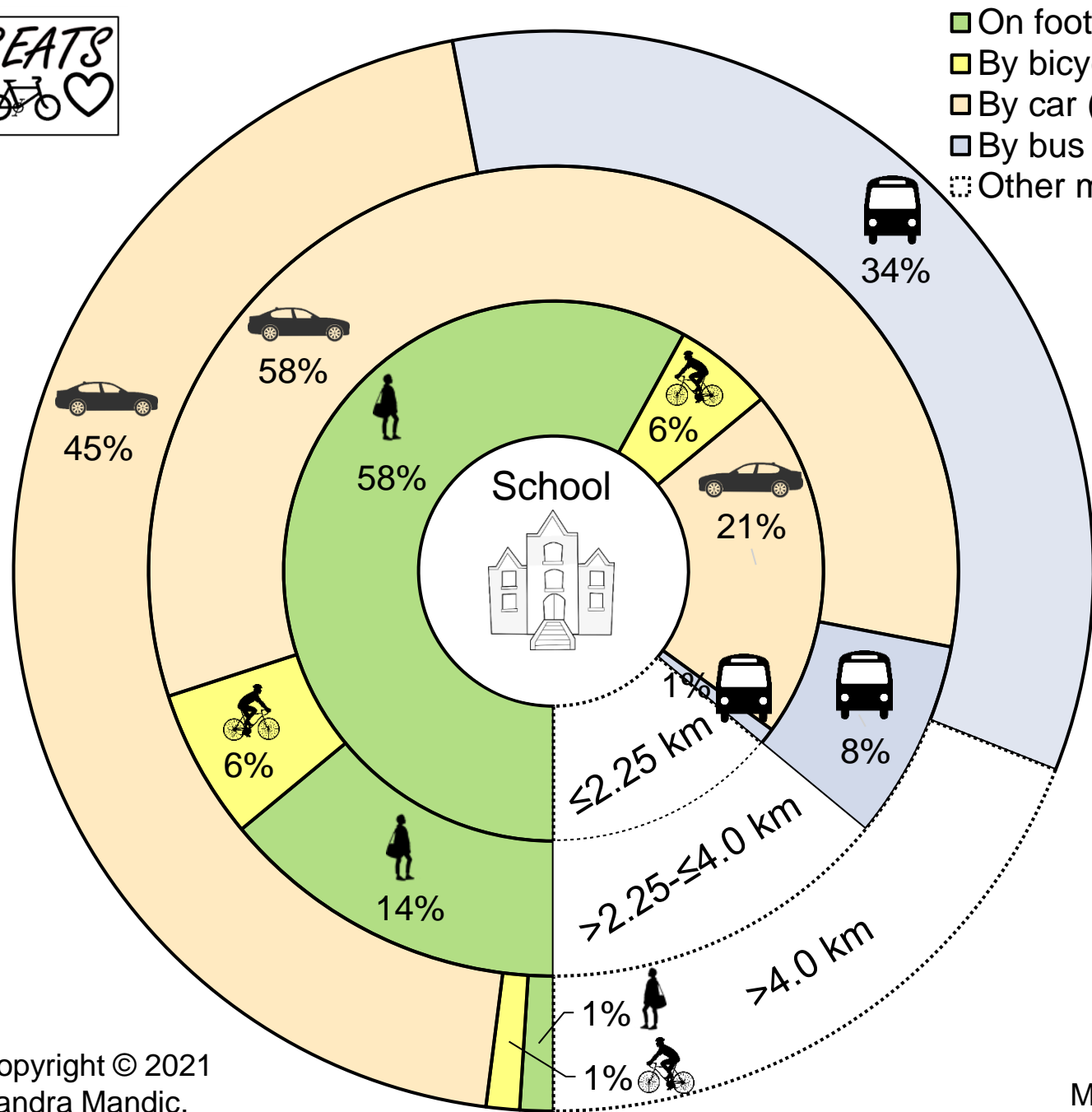
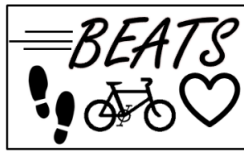
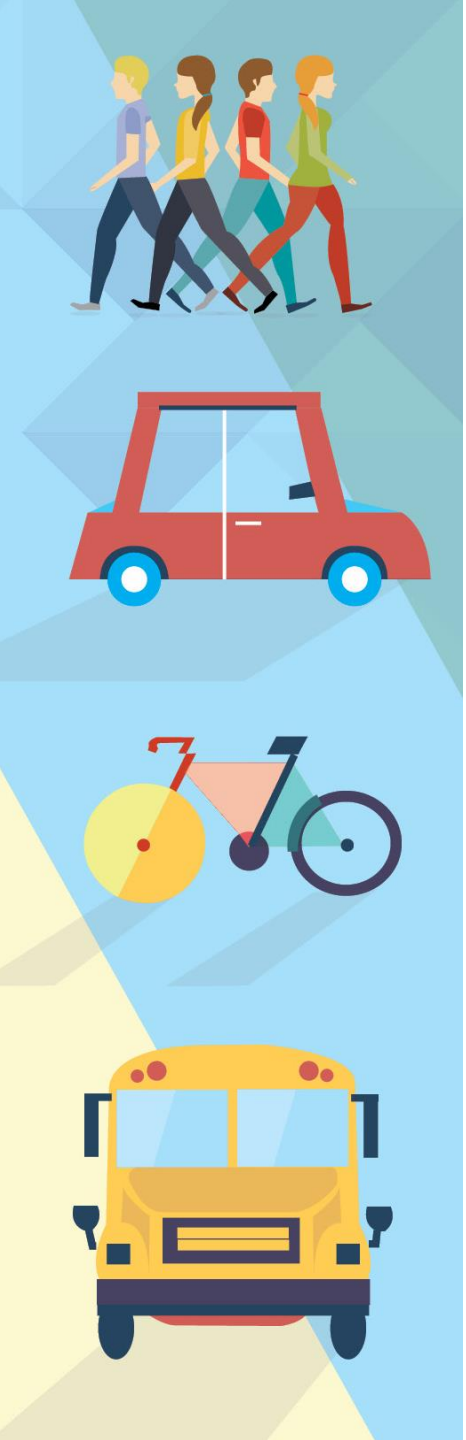


OTAGO BOYS' HIGH SCHOOL
Recti Cultus Pectora Roborant



Achieved **100% school recruitment rate** in the study city – **twice!**



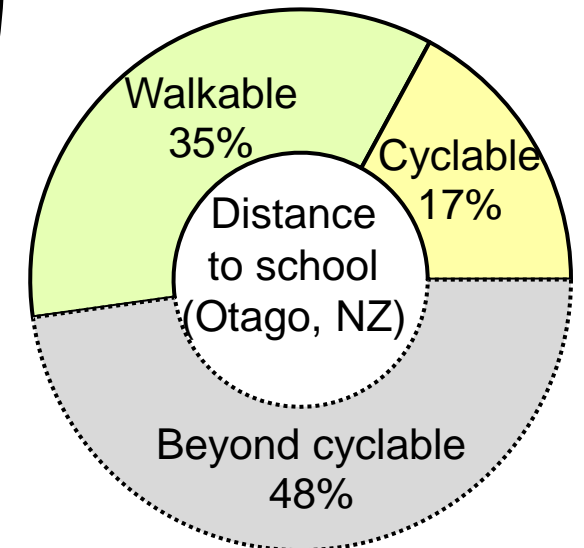


- On foot
- By bicycle
- By car (driven by others or driving)
- By bus (public or school bus)
- Other mode(s)

2,403 Otago adolescents

Total sample (Yellow box)

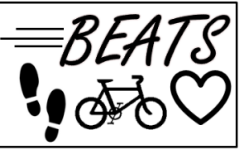
Within walking distance (Orange box)



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Sandra Mandic.

Mandic S et al. Journal of Transport & Health. 2023; 30:101585

Sociodemographic Characteristics



Total sample

2014-2015
n=1463

2021-2022
n=1421

2014-2015
n=1463

2021-2022
n=1421

Age (years)

15.1 ± 1.4

14.8 ± 1.3** ▼

Female gender

55%



44% ▼

Ethnicity

73%

NZ European 66%** ▼

11%

Māori 15% ▲

4%

Pacific 3%

7%

Asian 4%

5%

Other 12% ▲

New Zealand
index of deprivation

32% 1 (least deprived) 30%

25% 2 27%

20% 3 17%

15% 4 17%

9% 5 (most deprived) 11%** ▲

Similar differences were observed among adolescents living within walking distance to school

**p<0.001 versus 2014-2015



Bicycle and Vehicle Ownership



Total sample

Within walking distance

2014-2015

2021-2022

n=1463

n=1421

2014-2015

2021-2022

n=477

n=385

56%

57% ↔



Two or more
bikes at home

51%

53% ↔

69%

78%** ▲



Two or more
vehicles at home

59%

76%** ▲

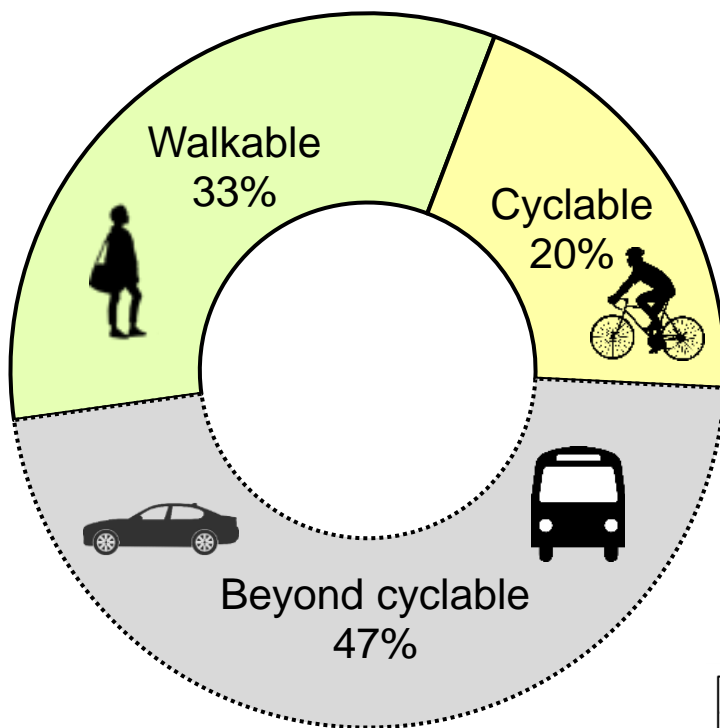
**p<0.001 versus 2014-2015

Home-to-School Distance

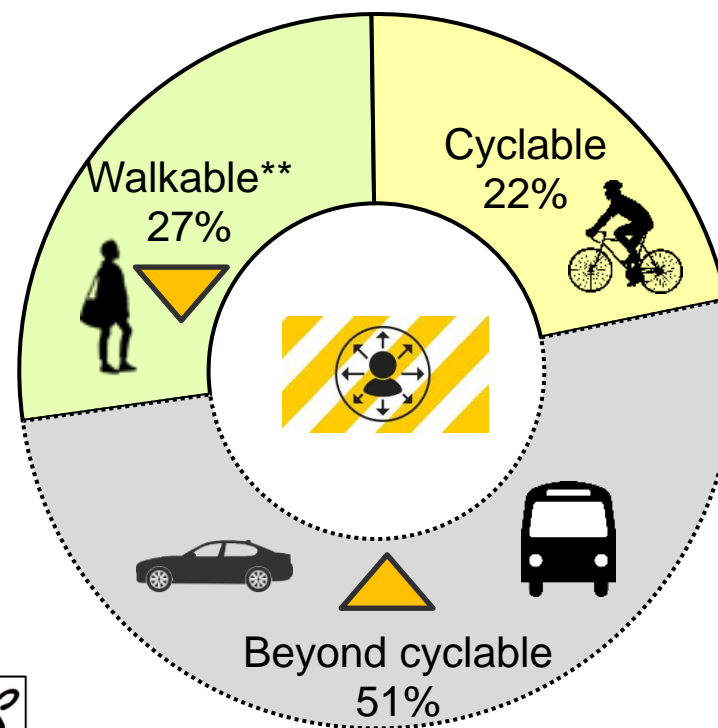


Total sample

2014-2015



2021-2022

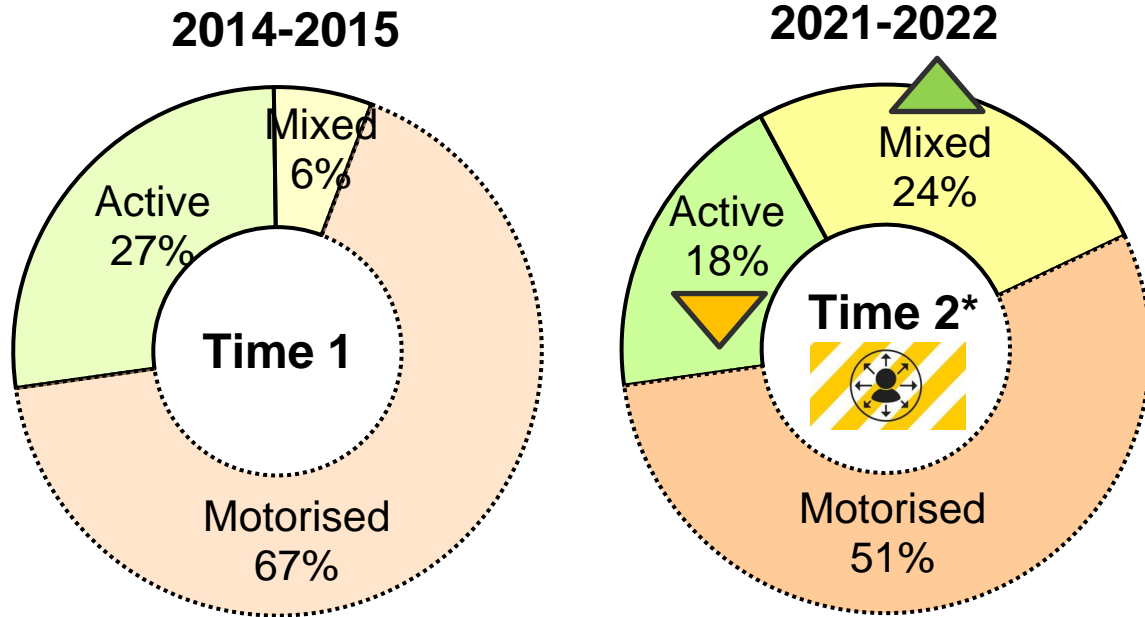


**p<0.001 versus 2014-2015

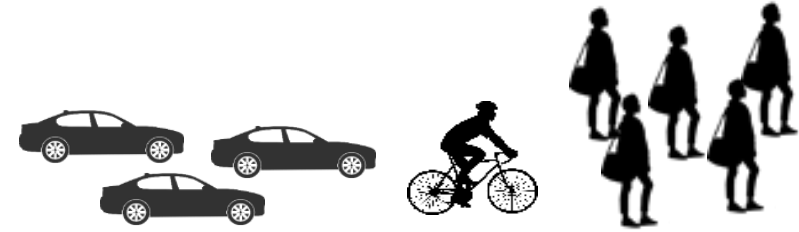
Modes of Travel to School



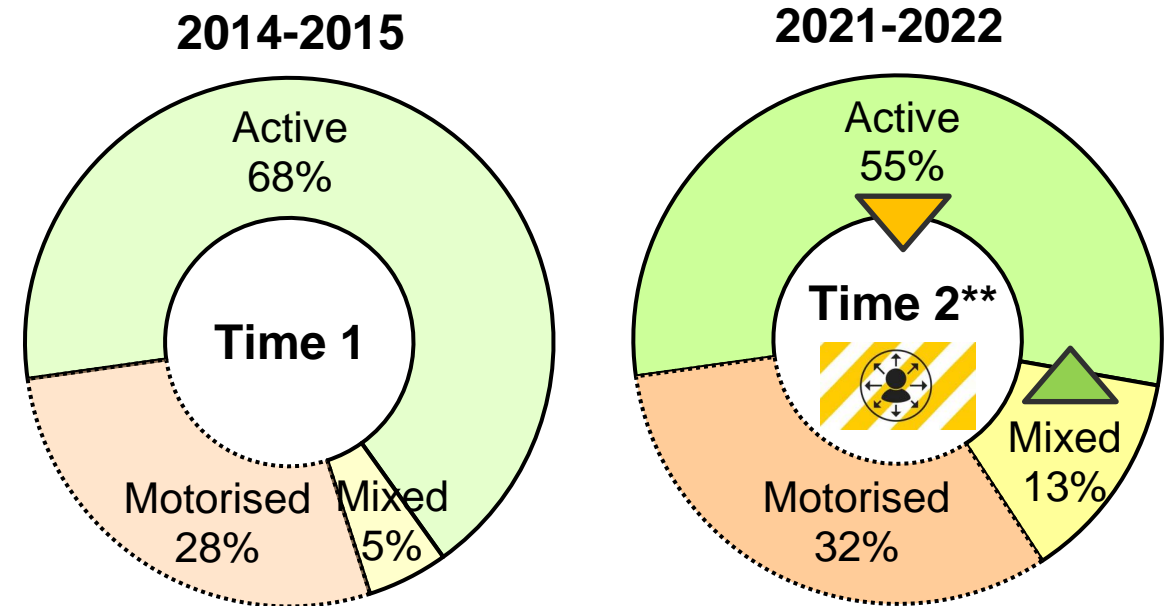
Total sample



*p<0.001 versus 2014-2015



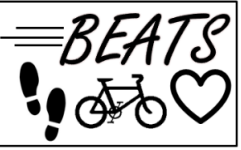
Within walking distance



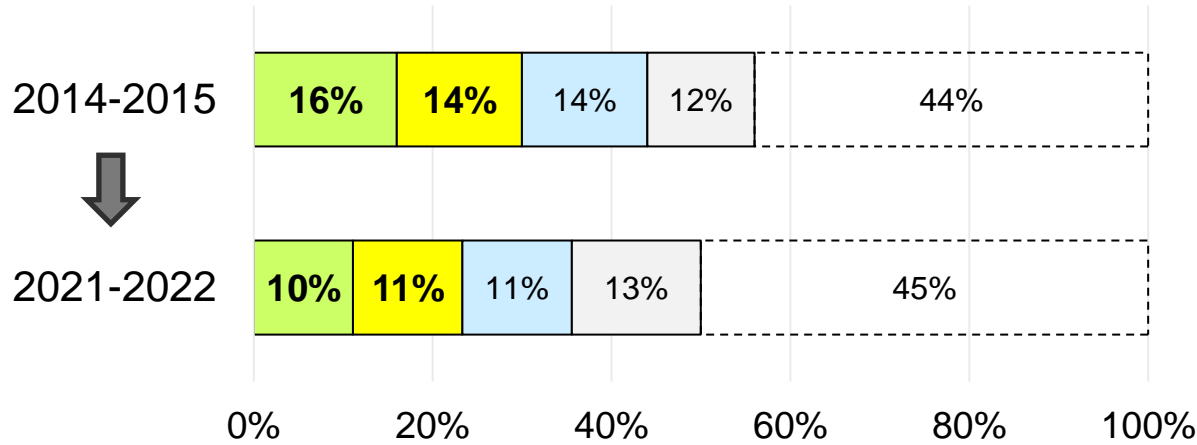
**p<0.001 versus 2014-2015

Mandic S et al. (article in review)

Frequency of Walking to School



Total sample



30%

21%**



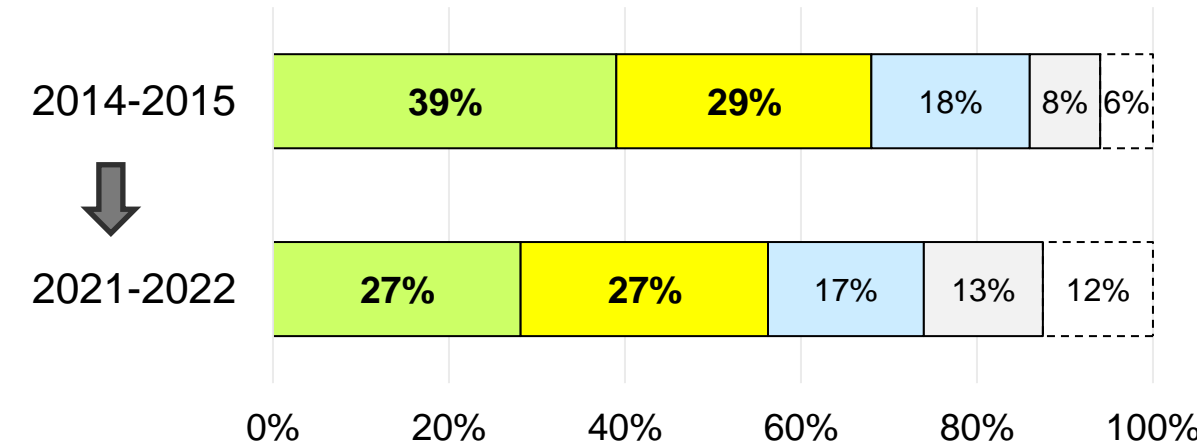
- All of the time
- Most of the time
- Sometimes
- Rarely
- Never

**Adjusted model*: OR 0.58
(95% CI: 0.43-0.79)**

*Adjusted for age, gender, ethnicity and neighbourhood deprivation



Within walking distance



68%

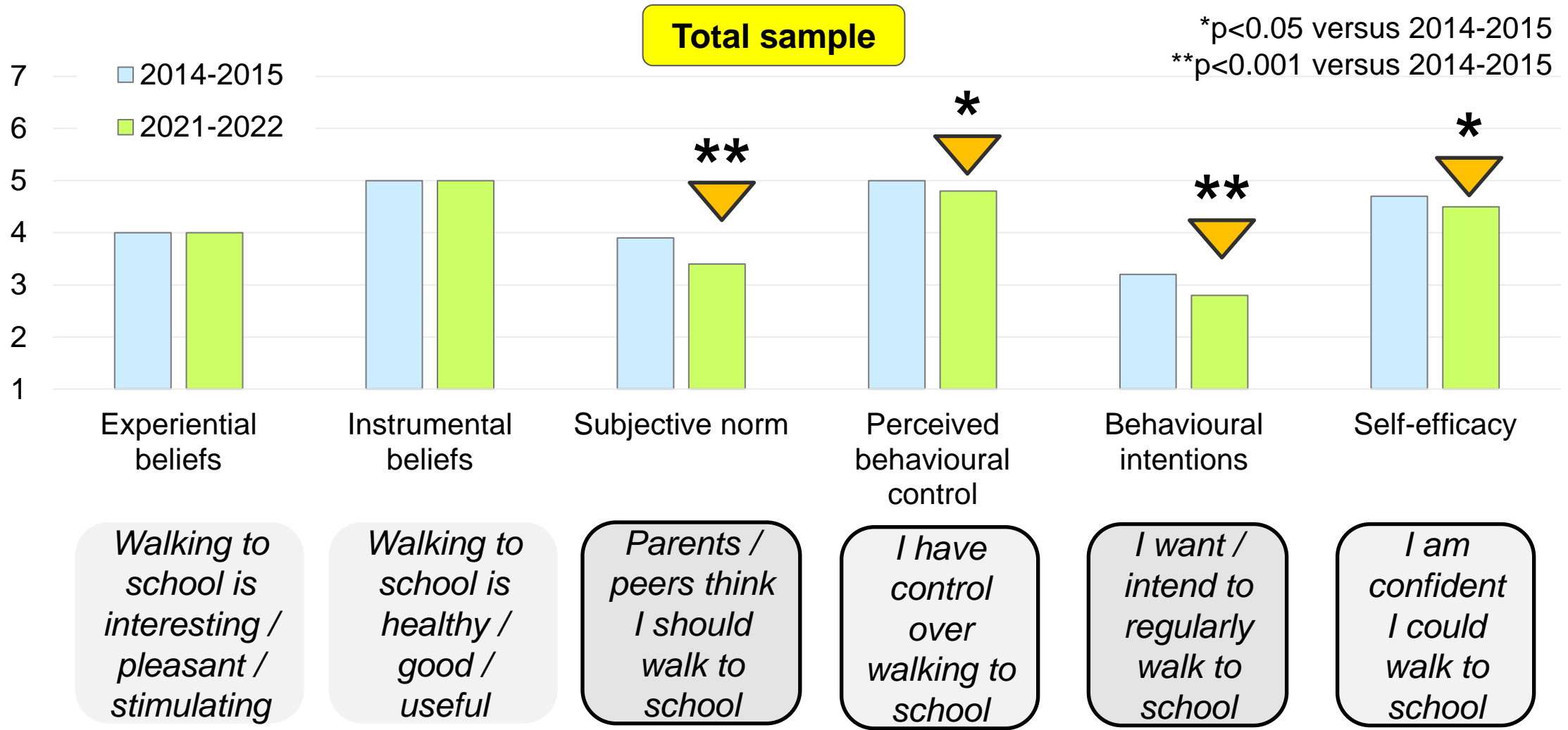
54%**



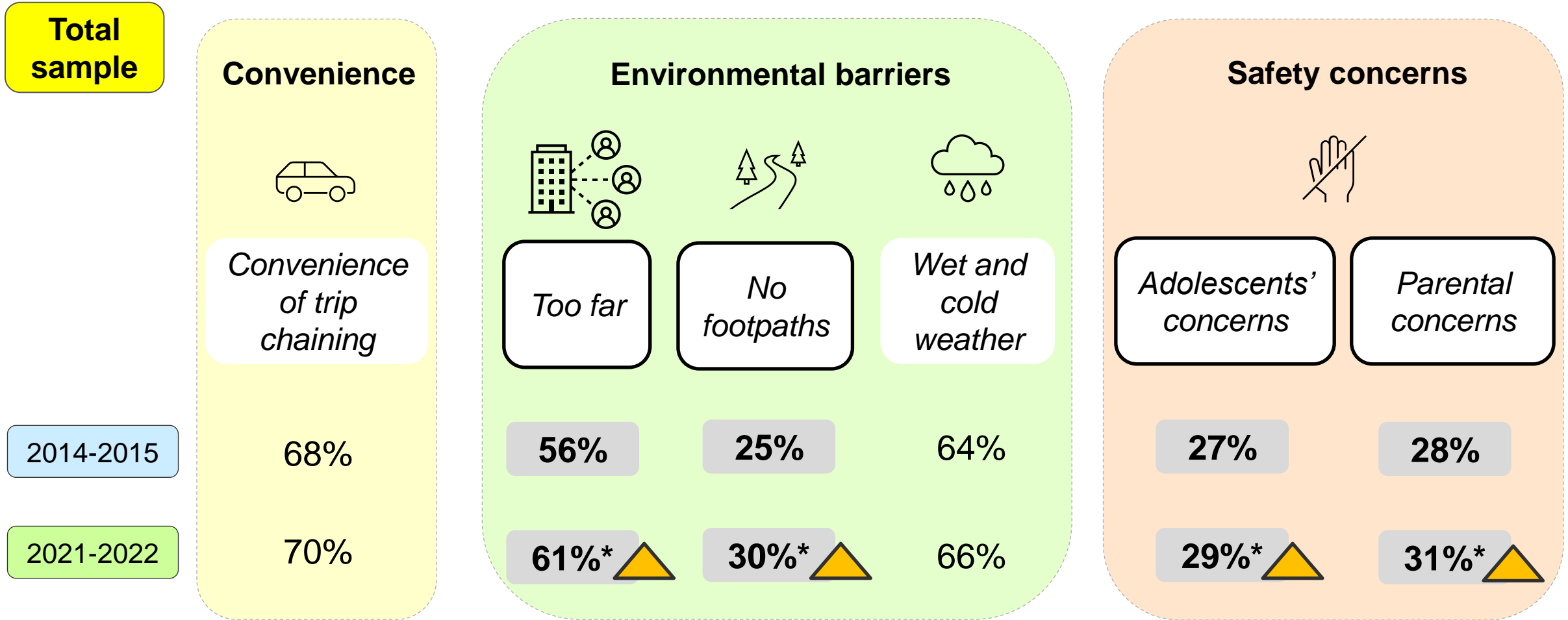
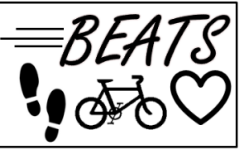
- All of the time
- Most of the time
- Sometimes
- Rarely
- Never



Walking to School: Attitudes, Beliefs and Intentions

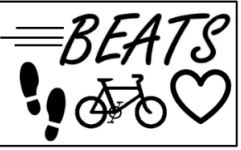


Perceptions of Walking to School



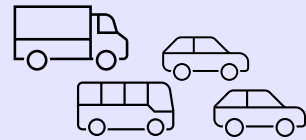
*p<0.05 versus 2014-2015
 **p<0.001 versus 2014-2015

Walking to School Perceptions




Total sample

Route to School



Too much traffic


49%

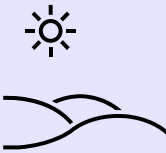
55%** 



Presence of dangerous crossings


45%

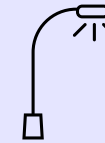
52%** 



Too many hills


47%

57%** 



Poor lighting

21%

32%** 

**p<0.001 versus 2014-2015

Conclusions



2014-2015

5-6 years prior to the COVID-19 pandemic

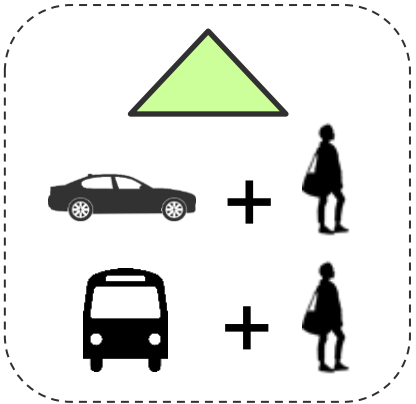
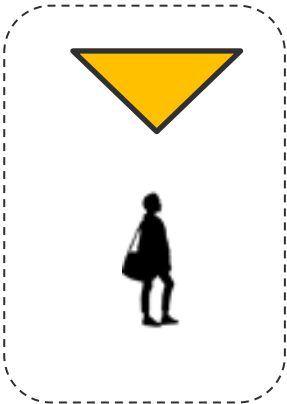
versus

2021-2022

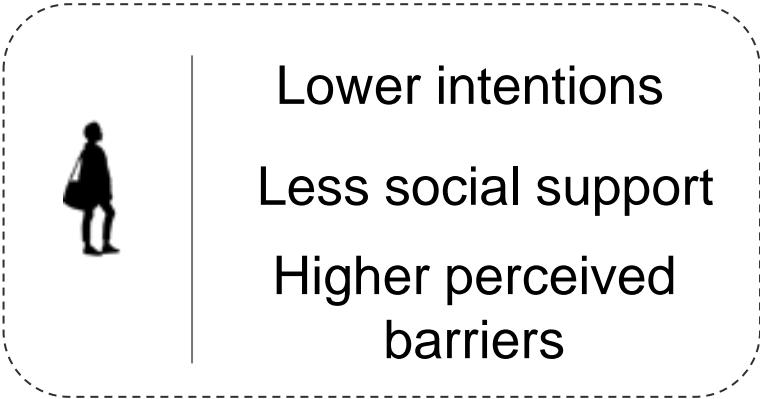


1-2 years following the onset of the COVID-19 pandemic

Transport to school patterns



Perceptions of walking to school



Need for renewed and extended efforts from cross-sectoral actors to support active school transport among adolescents during COVID-19 pandemic recovery efforts and in future similar events

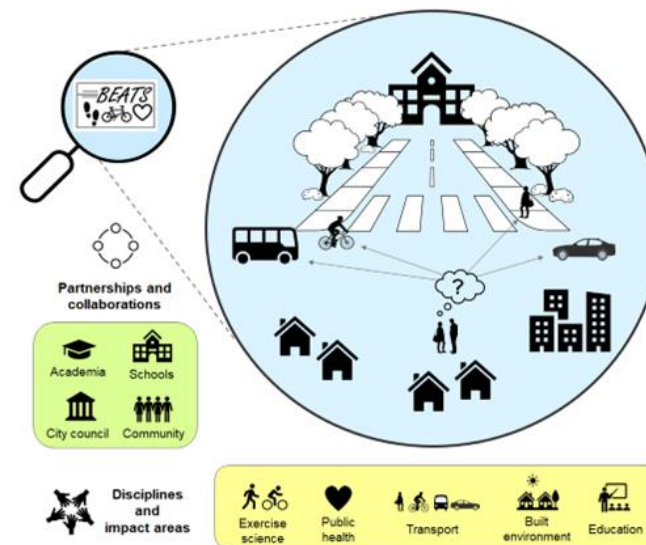
Final BEATS Research Programme Report 2013-2023

Available to download from
the AGILE Research Ltd. website:

<https://agileresearch.nz/beats/>

BEATS Research Programme 2013-2023

The Power of Vision, Teamwork, Perseverance
and Project Management

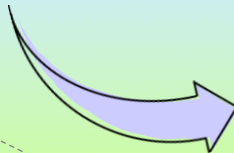
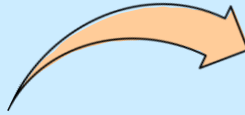
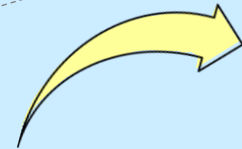
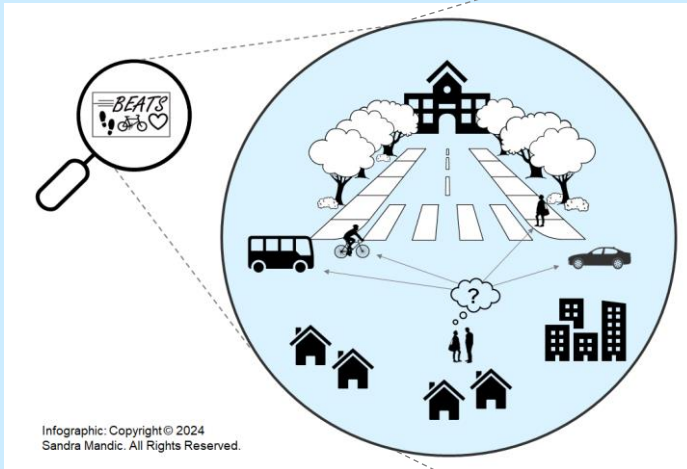


Dr Sandra Mandic, PhD, PMP

 AGILE
Research

What is Next?

BEATS Research Programme (2013 – 2023)



[AGILE Research Ltd.](#)
Research consultancy founded by Dr Sandra Mandic



[Compass Guide Research Training Resources](#)
Created by Dr Sandra Mandic



New research using BEATS data
“Green Space Equity and Youth Wellbeing in Aotearoa
New Zealand” led by Prof Melody Smith (2023-2025)



**Dr Mandic joined the Transport Strategy Team
at Wellington City Council in 2021**
(Wellington, New Zealand)

Compass Guide Research Training Resources

By AGILE Research Ltd. (Created by Dr Sandra Mandic)

Designed to help teams and individuals navigate the research process and to successfully plan and manage their research projects




[Compass Guide Books](#)



[Compass Guide workshops and courses](#)



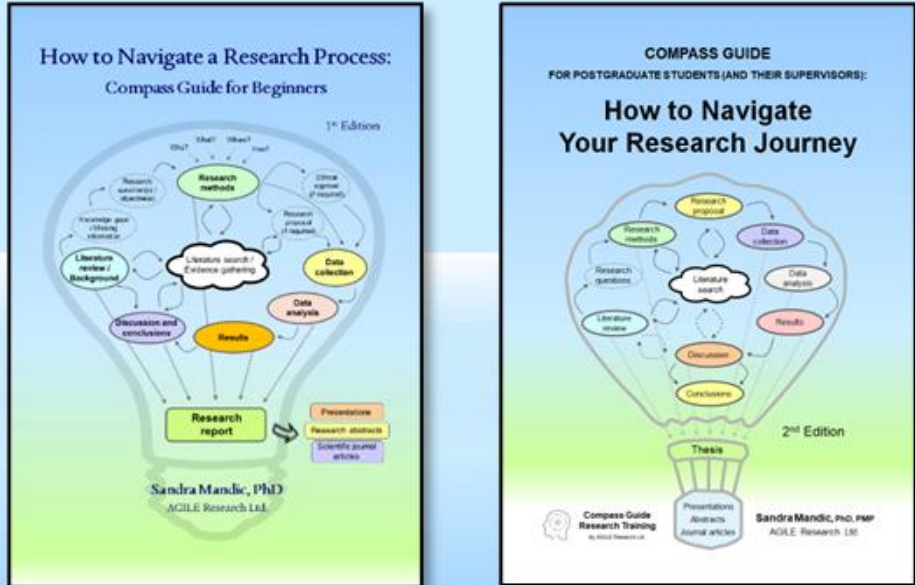
[AGILE Research YouTube Channel](#)

 **How to Navigate the Research Process**

[Compass Guide for Beginners](#) [Compass Guide for Postgraduate Students \(and Their Supervisors\)](#)

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How to Plan and Manage Research Projects

[Compass Guide for Research Project Management](#)

COMPASS GUIDE for Research Project Management 1st Edition



For details, check out the AGILE Research Ltd. website:

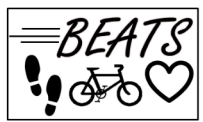
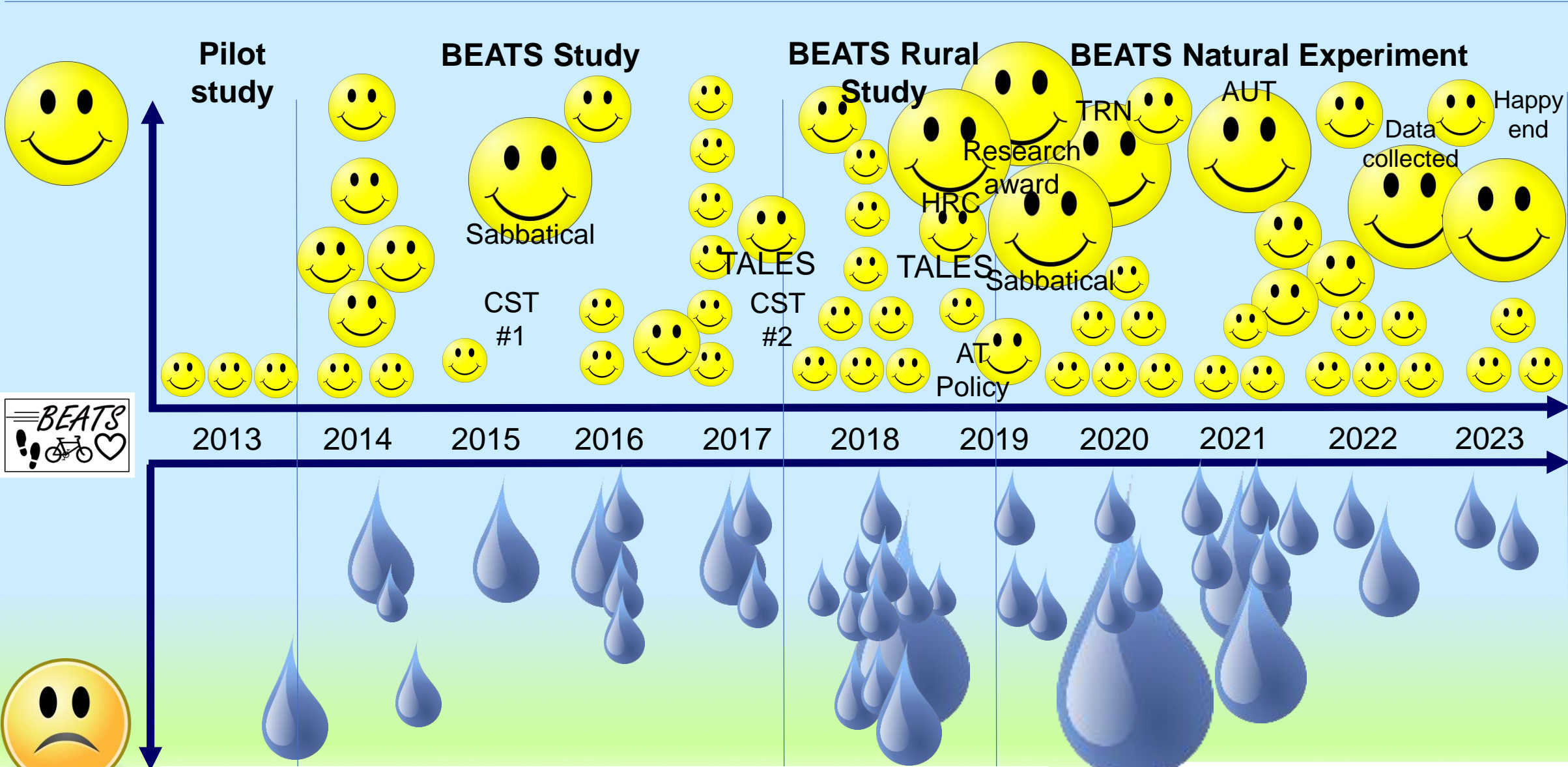
www.agileresearch.nz

FINALIST 

Sandy Mandic
Academic Achievement
in Project Management



BEATS Principal Investigator's Happiness Index 2013-2023



(This infographic is based on the actual events and the lead researcher's project-related happiness index along the 10-year BEATS Research journey.)

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<https://agileresearch.nz/beats/>

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