Multidisciplinary Collaboration and Multi-Sector Partnership for Active Transport Research

Associate Professor Sandy Mandic

on behalf of the BEATS Study Research Team

Active Living Laboratory
School of Physical Education, Sport and Exercise Sciences
University of Otago

Email: sandra.mandic@otago.ac.nz

Active Living Laboratory

University of Otago Te Whare Wānanga o Otāgo New Zealand

Dunedin City Council Kaunihera-a-rohe o Otepoti

Heart Foundation Fulfil a lifetime

Lottery Grants Board Te Puna Tahua

hrc Health Research Council of New Zealand

BEATS Research Team 2017-2018

A/Prof Sandra Mandic (Otago) ✓

A/Prof Antoni Moore (Otago) ✓

Dr Christina Ergler (Otago) ✓

Dr Enrique García (Limerick) ✓

Prof John Spence (Alberta) ✓

Dr Debbie Hopkins (Oxford) ✓

Dr Susan Sandretto (Otago) ✓

Dr Kirsten Coppell (Otago) ✓

A/Prof Michael Keall (Otago) ✓

Dr Anna Rolleston (Auckland) ✓

Advisory Board

Mr Gordon Wilson (DSSP) ✓

Mr Gavin Kidd (DSSP) ✓

Mrs Charlotte Flaherty ✓

A/Prof Janet Stephenson (Otago)

Mr Nick Sargent (DCC) ✓

Mr Graeme Rice (NZTA) ✓

Collaborators

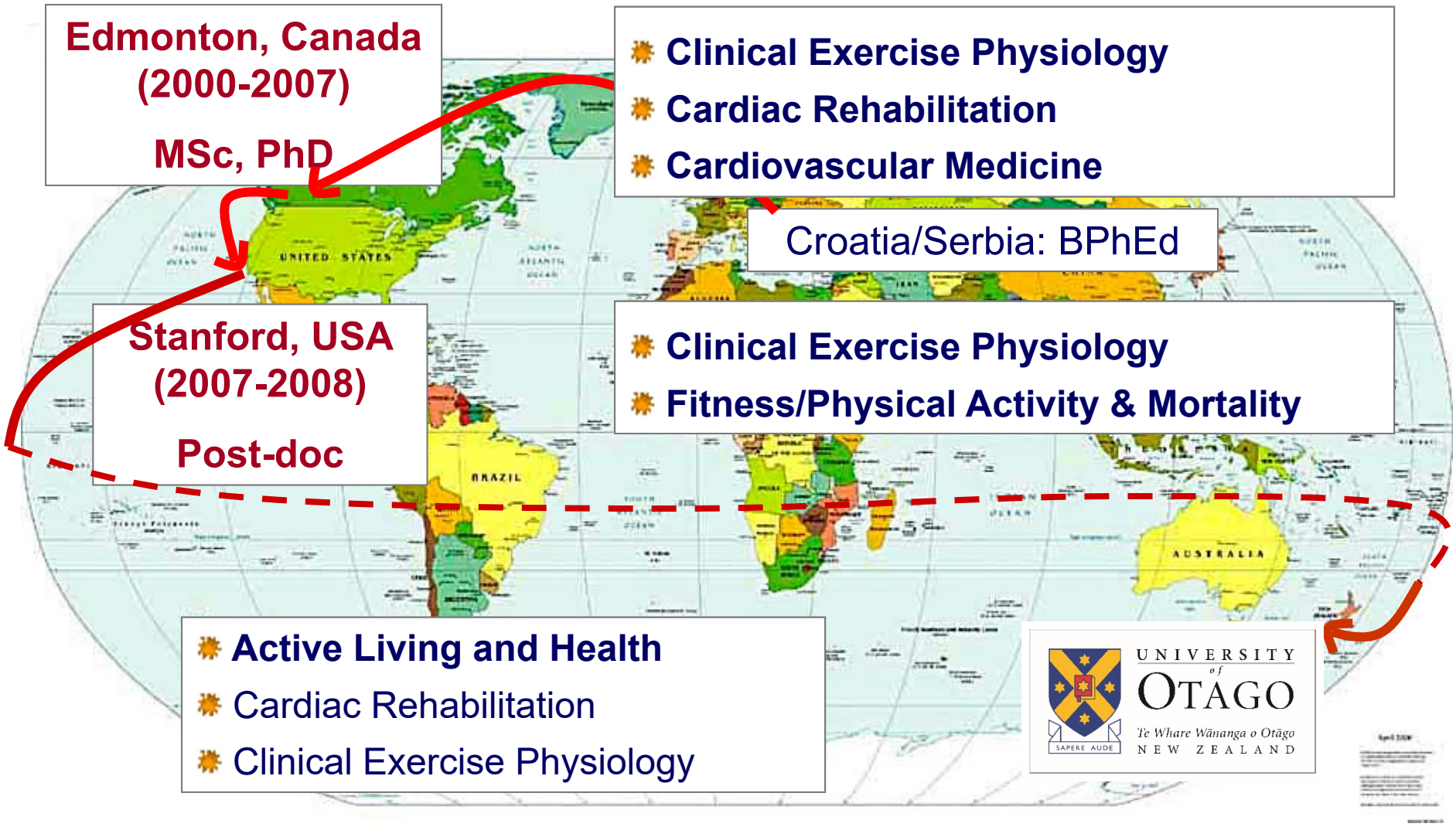
A/Prof Palma Chillón (Granada)

A/Prof Melody Oliver (Auckland)

...

✓ **Authors**

Academic and Personal Journey



Areas of research

- Physical Activity
- Public Health
- Transport
- Built Environment
- Sustainability

Teamwork | Curiosity | Creativity | Excellence

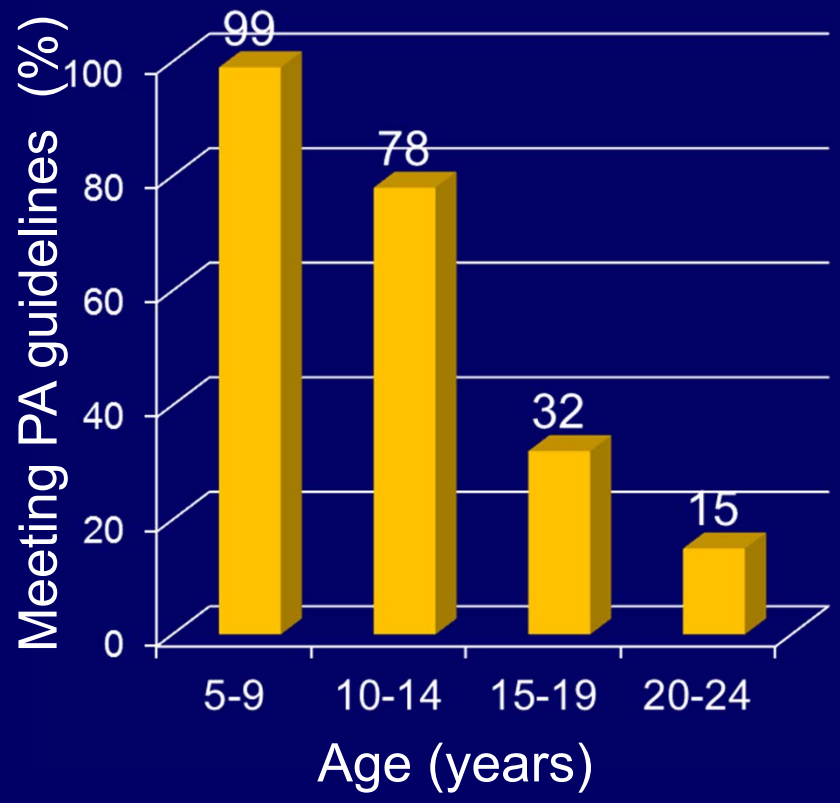
www.otago.ac.nz/active-living

BEATS Study Students Research Assistants, and Volunteers (2013-2017)

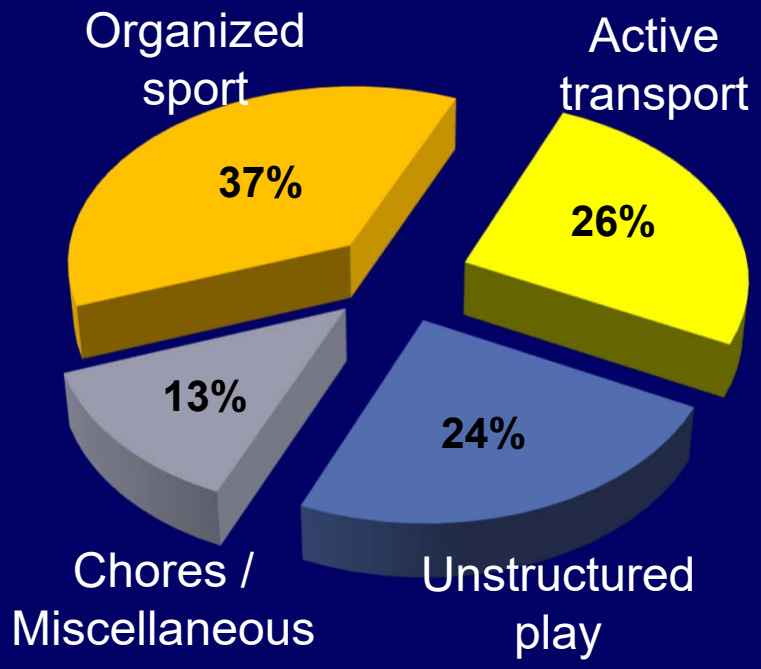
BEATS

BEATS Study Research Assistants, Students and Volunteers 2018

Physical Activity in Children and Adolescents



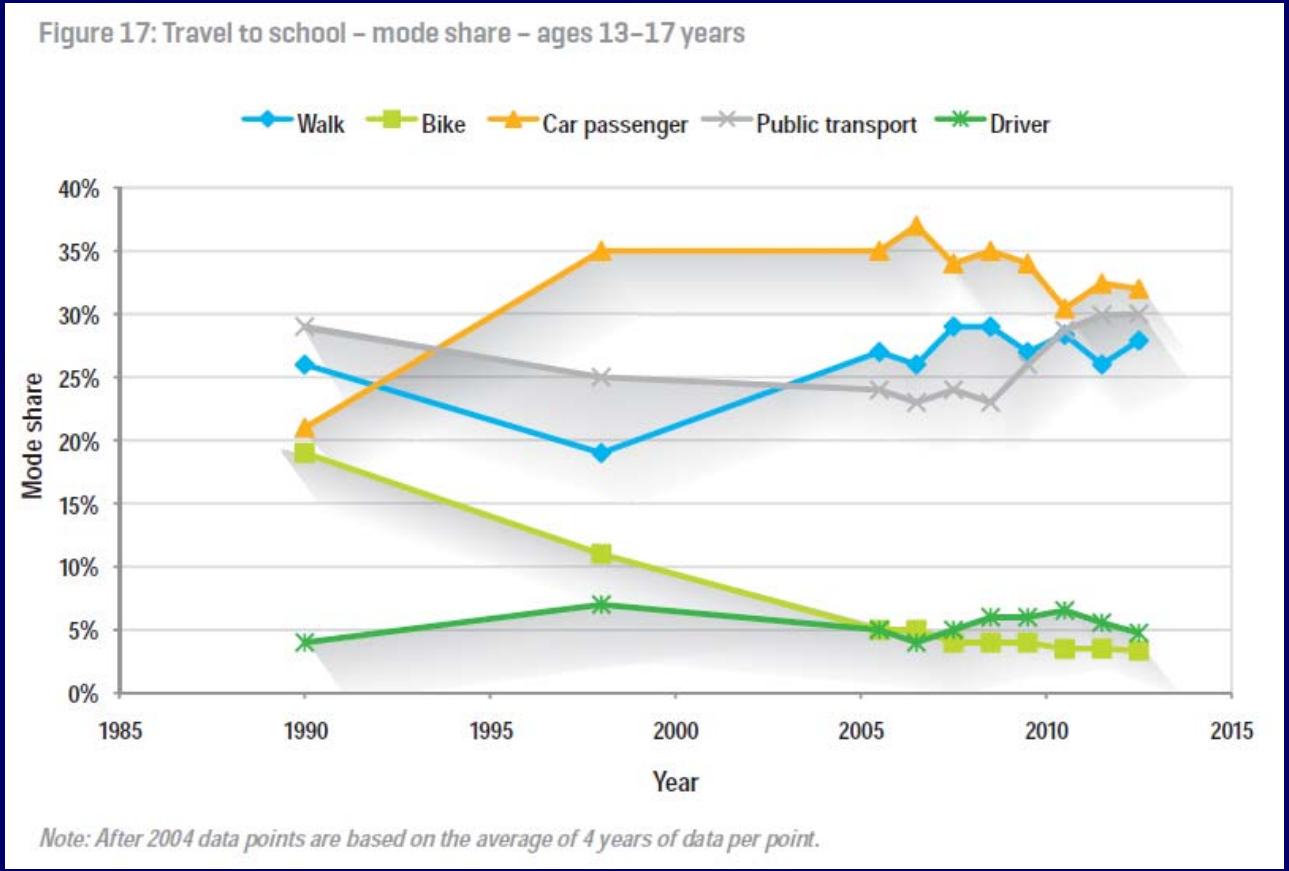
Moderate-to-vigorous PA in 10- to 13-year old children



National Survey of Children and Young People Physical Activity and Dietary Behaviour in NZ. 2007/08

Olds T et al. J Phys Act Health. 2011;8:58-557

Transport to School in NZ: 1989-2014



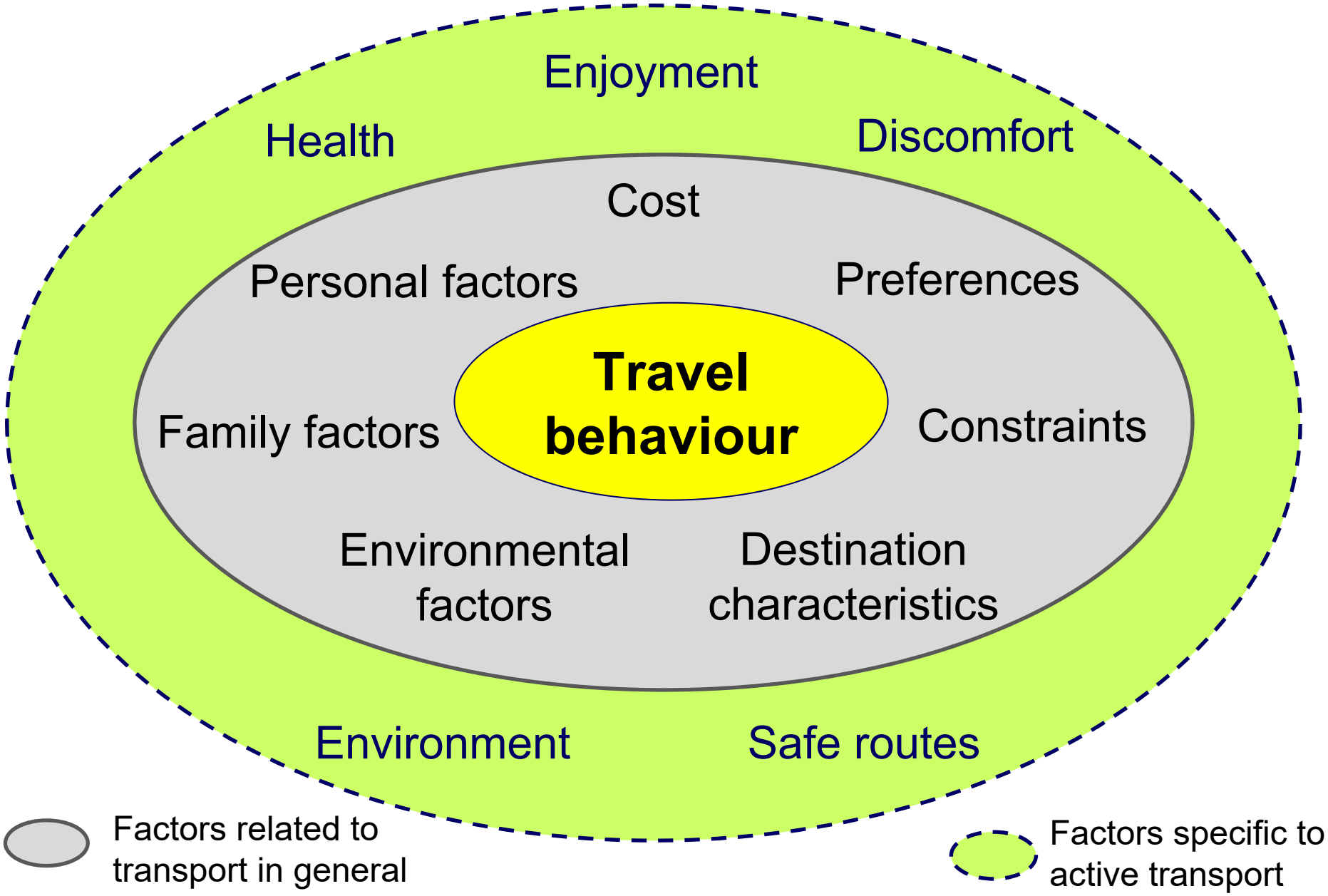
1989/1990

Travel to school:
21% driven
26% walking
19% cycling

2010-2014

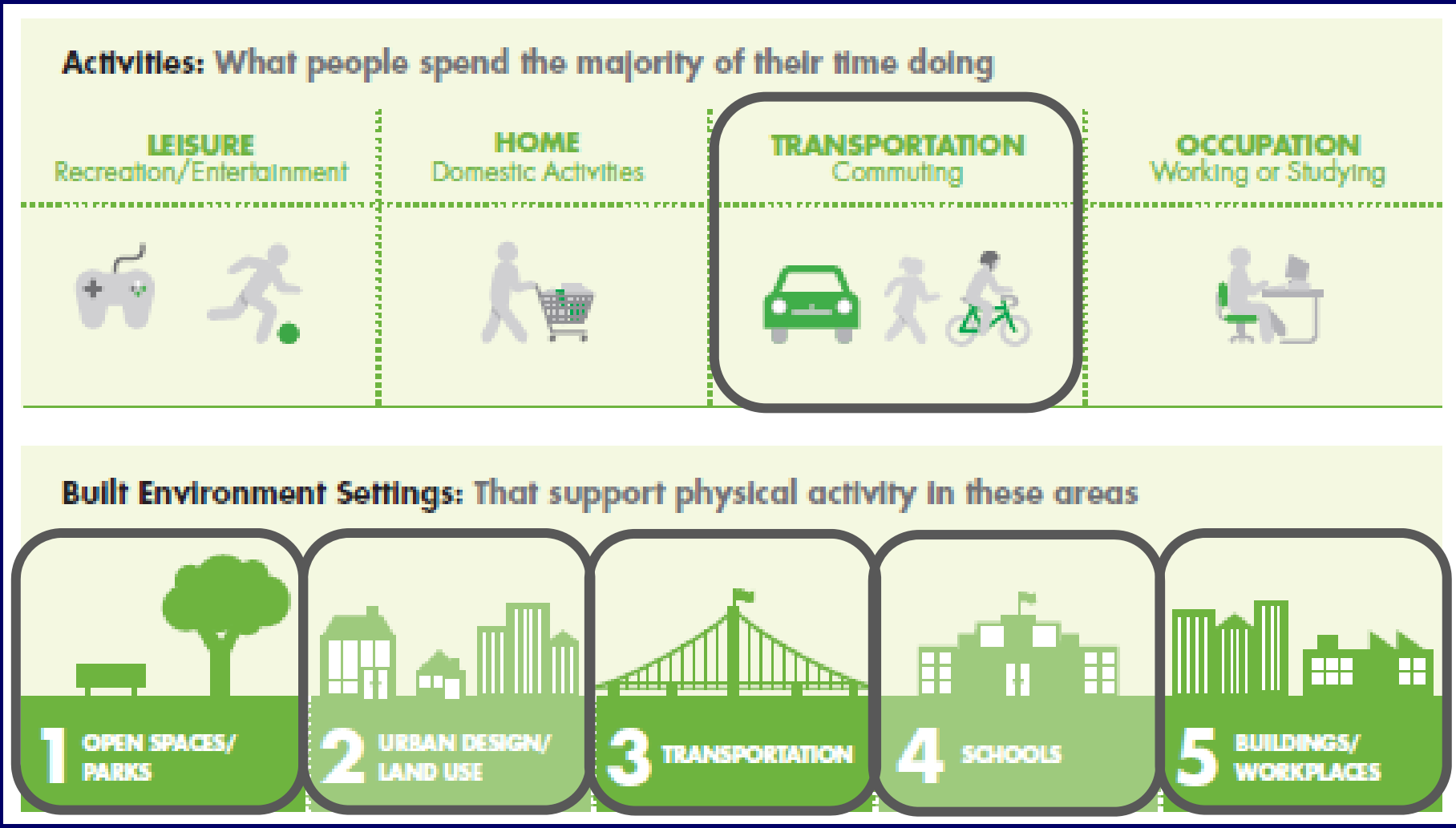
Travel to school:
32% driven
27% walking
3% cycling

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



Adapted from Mandic S et al. Journal of Transport and Health. 2017; 4:294-304

Built Environment and Transport Behaviour



www.designedtomove.org

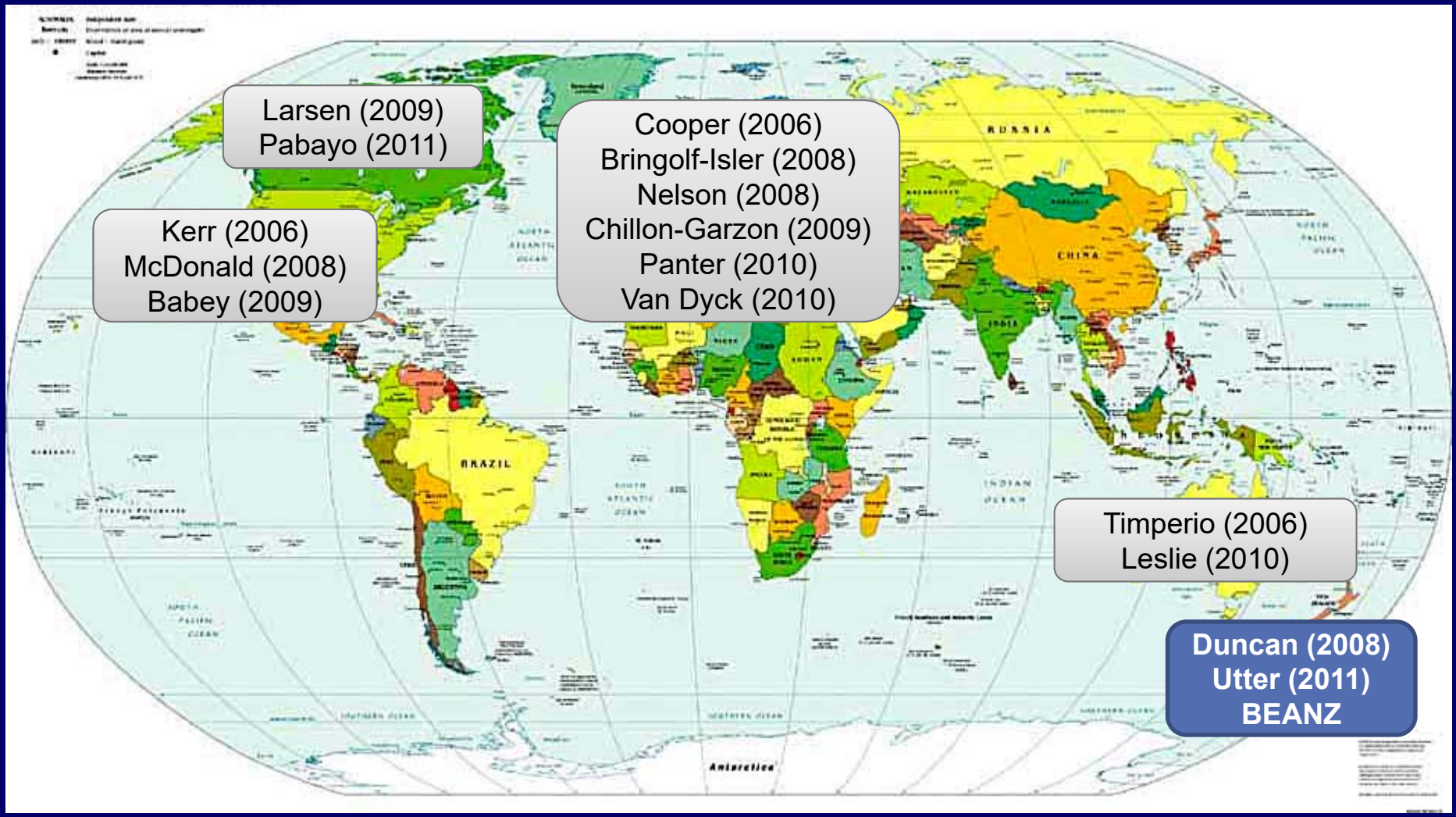
Built Environment and Transportation

- 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



Different urban layouts and social norms (e.g. private vehicle ownership) compared to NZ

UNIVERSITY of OTAGO
Te Whare Wānanga o Otāgo
NEW ZEALAND

OTAGO HOME

BEATS Study

- Information for study participants
- Information for researchers and policy makers
- Research team
- Publications
- Prospective graduate students
- Volunteers
- News and events
- Contact us

Haere mai, welcome to the BEATS Study

Active Living Laboratory

BEATS Study

Built Environment and Active Transport to School

What is this study about?

Why is this study important?

- **The BEATS Study investigates:**
  - **transport to school habits,**
  - **the neighbourhood environment and**
  - **physical activity habits**

  in Dunedin adolescents.

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www.otago.ac.nz/beats

The BEATS Study Poster (271 KB)

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

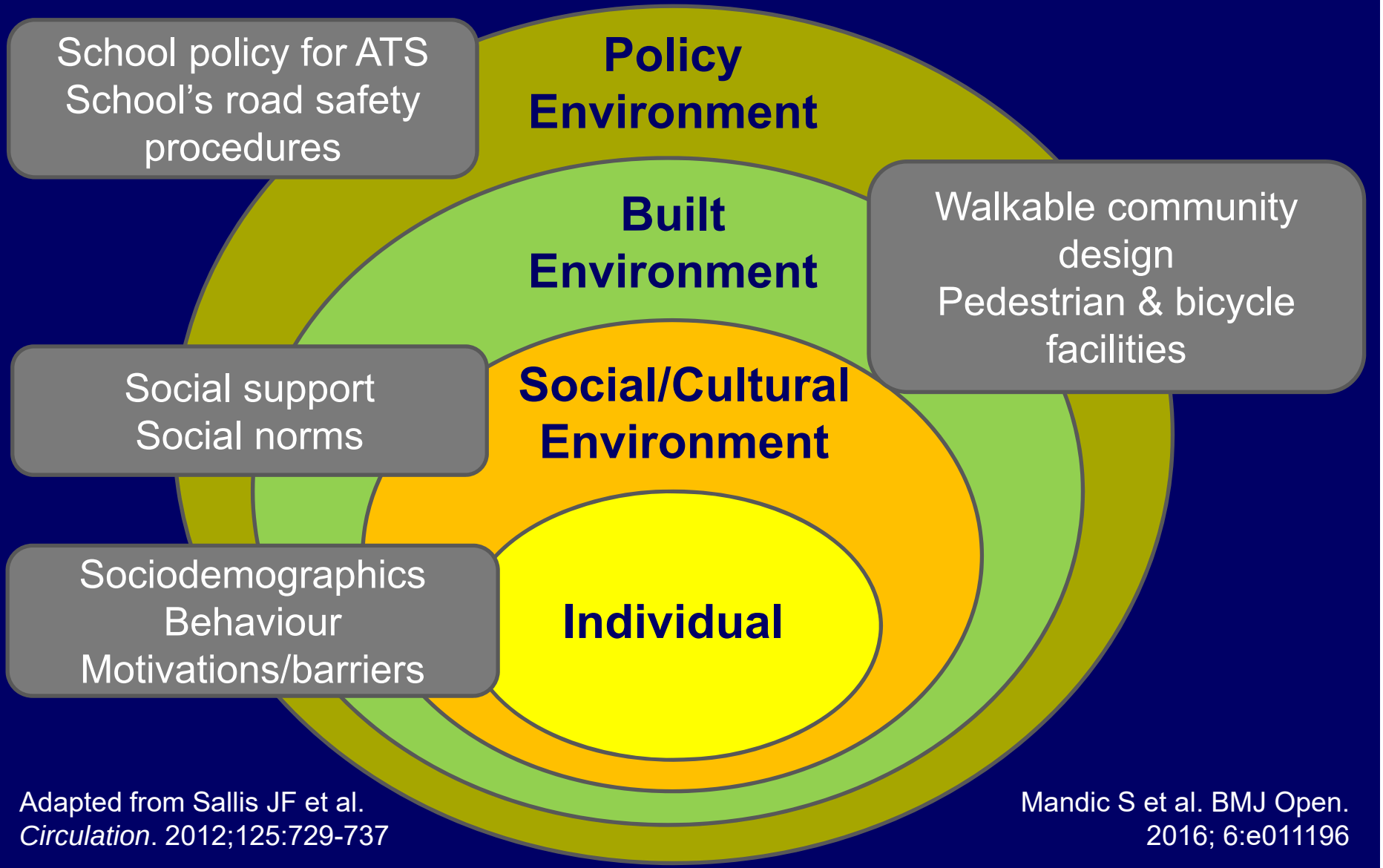
BEATS Study: Objectives

- **To understand the reasons behind adolescents and their parents' choice of transport** mode to school using the ecological approach;
- **To examine the interaction** between the transport choices, built environment, physical activity levels, and weight status in adolescents;
- **To identify policies** that promote or limit ATS in adolescents
- **To provide baseline data** to examine future impact of:
  - The built environment changes (Dunedin Cycleway developments): *BEATS-2 Study (2019-2022)*
  - South Dunedin Bike Library
  - Cycle Skills Training in schools *(evaluation completed in 2015-2017)*

BEATS Study: A Community-Academic Research Partnership that Works

- Successful multi-sector collaboration involving academia, schools and local council
- Stakeholders involvement facilitates the generation of usable data, relevant to the local context and generalisable to other areas, and translation of knowledge into policy and future initiatives
- Generation of new knowledge to inform future school-, neighbourhood- and city/town-wide built environment changes to address barriers and encourage active transport to school in both urban and rural settings

BEATS Study 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

Ecological model framework	Individual	Social/Cultural Environment	Built Environment	Policy Environment
Level	Students (n=2000)	Parents (n=1000) Peers	Neighbourhood School	School
Outcome measures	Demographics Travel to school Active transport to school (ATS) motivations and barriers Perceptions of built environment Health behaviours Body mass index Physical activity	Parental demographics Travel to school for child(ren) Parental motivations and barriers for ATS Parental perceptions of built environment Parental health behaviours	Geographic Information System (spatial analysis, modelling and visualisation) Perceived environment Route to school maps	School policy for ATS ATS-Related messages Health and safety liabilities School road safety procedures, education and messages
Assessment procedures	Student survey Anthropometry Accelerometers Focus groups	Parental survey, accelerometers and focus groups Student survey (for peers)	GIS Analysis Questionnaires Maps	Teachers' Focus Groups School Principals' interviews

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

BEATS Study Research Methodology

Adolescents & Parents

Survey

Maps; GIS Analysis

Anthropometry

Physical Activity

School bag weight

Adolescents

Focus groups

Adolescents, Parents, Teachers

Interviews

School Principals

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

BEATS Study Framework: Ecological Model for Active Transport

May 2013

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

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

How to pull this off
and
who is going to pay for it?

2013

Building a Multidisciplinary Research Team

Exercise science

Dr Sandy Mandic

Policy makers

Charlotte Flaherty

Geographic information science

Dr Tony Moore

Behavioural medicine

Prof John Spence

BEATS Study
Built Environment and Active Transport to School

(2013-2014)

Statistics

Dr John Williams

Health promotion

Dr Enrique García Bengoechea

Quantitative research methods

Drs Williams/Mandic

Qualitative research methods

Dr Debbie Hopkins

Building Research Collaborations (2013-2014)

University of Otago
Te Whare Wānanga o Otāgo
New Zealand

THE SCHOOL OF PHYSICAL EDUCATION, SPORT AND EXERCISE SCIENCES
TE KURA PARA-WHAKAWAI

Dr Sandy Mandic

Dunedin City Council
Kaunihera-a-rohe o Otepoti

Mrs Charlotte Flaherty

School of Surveying
Te Kura Kairūri

Dr Tony Moore

BEATS

University of Alberta

Prof John Spence

McGill

A/Prof Enrique García

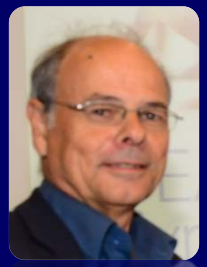
Otago Business School

Dr John Williams

Centre for Sustainability
Agriculture · Food · Energy · Environment
Kā Rakahau o Te Ao Tūroa

Dr Debbie Hopkins

Establishing Links with the Community and Forming BEATS Advisory Board



Mr Gordon Wilson

Dunedin Secondary Schools' Partnership

Mr Andrew Lonie

DUNEDIN CITY COUNCIL
Kaunihera-a-rohe o Otepoti

Mrs Ruth Zeinert

Getting Dunedin Active Initiative

Prof Janet Stephenson (Otago)

Centre for Sustainability
Agriculture · Food · Energy · Environment
Kā Rakahau o Te Ao Tūroa

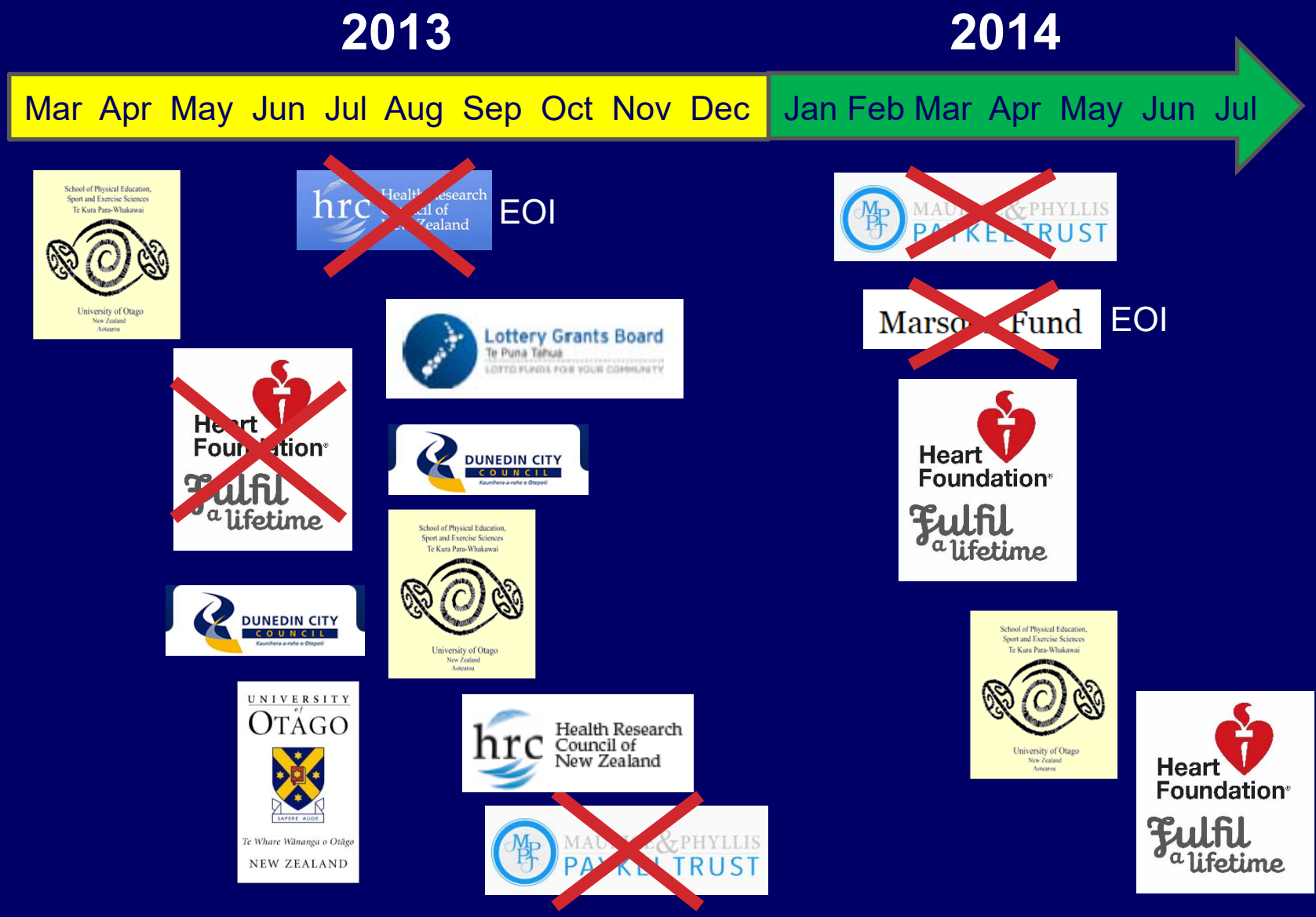
Dr Tara Duncan (Otago)

Department of Tourism
Te Mātauraka Tāpoi

Dr Susan Sandretto (Otago)

College of Education
Te Kura Akau Taitoka

Writing Research Grants



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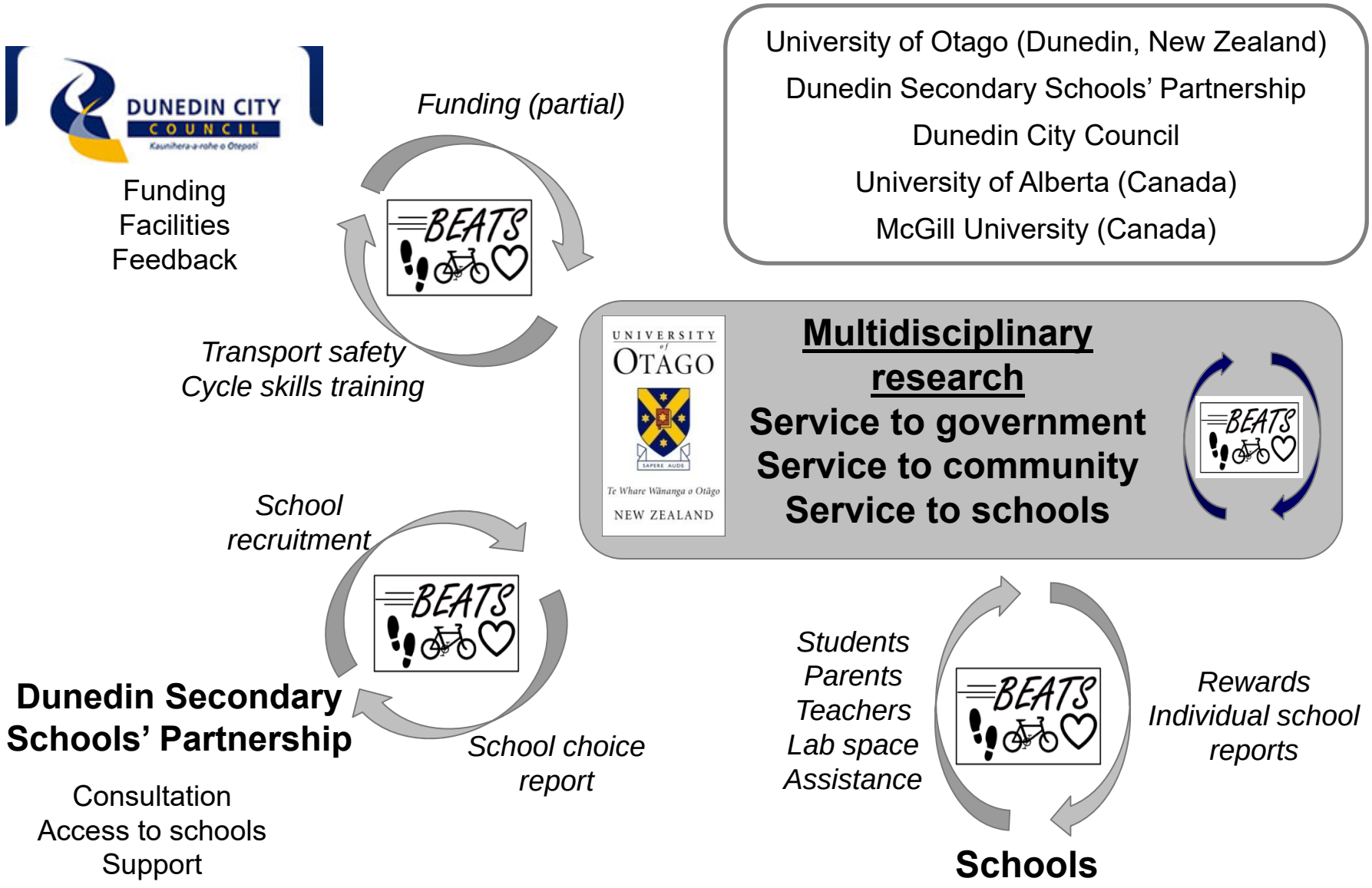
Assessment procedures	Student survey Focus groups	Parental survey, Student survey (for peers)	GIS Analysis Questionnaires Maps	Teachers' Focus Groups interview

Aug 2014



Mandic S et al. BMJ Open. 2016; 6:e011196
Mandic S et al. Retos, 2015:28;197-202.

Developing Study Materials

Built Environment and Active Transport to School: The BEATS Study

Background

Despite multiple benefits of physical activity, the lack of physical activity and sedentary lifestyles in school-age children is a global health problem. Active transport to school is a convenient way to integrate physical activity into everyday life, maintain or increase physical activity level and may develop into environmentally sustainable travel practices over a lifetime.

The BEATS Study has been designed to investigate active transport to school habits in adolescents using the most contemporary and comprehensive theory for active transport; this accounts for individual, social, environmental, and policy influences.(Figure 1).

Figure 1. Ecological model for active transport to school
(Adapted from Sallis et al. Circulation. 2012 ;125:729-737)

Purpose

- To understand the reasons behind adolescents and their parents' choices of transport mode to school using the ecological approach;
- To examine the interaction between the transport choices, built environment, physical activity levels, fitness and weight status in adolescents;
- To identify policies that promote or limit ATS in adolescents.

Research Design and Methodology

The BEATS Study will survey students, parents and teachers in Dunedin secondary schools (Figure 2). Using an online questionnaire, this study is aiming to survey 2,000 students (about 150 to 200 students per school), 1,000 parents (80 to 100 parents per school) and 100 school teachers (8 to 10 teachers per school) from 12 secondary schools in Dunedin. Some participants may also decide to take part in focus groups, physical activity and anthropometry assessments.

Ecological model framework	Individual	Social/Cultural Environment	Built Environment	Policy Environment
Level	Students (n=2000)	Parents (n=1000) Peers	Neighbourhood School	School
Outcome measures	Demographics Travel to school Active transport to school (ATS) motivations and barriers Perceptions of built environment Health behaviours Body mass index Physical activity	Parental demographics Travel to school for child(ren) Parental motivations and barriers for ATS Parental perceptions of built environment Parental health behaviours	Geographic Information System (spatial analysis, modelling and visualisation) Perceived environment Route to school maps	School policy for ATS ATS-Related messages Health and safety liabilities School road safety procedures, education and messages
Assessment procedures	Student survey Anthropometry Accelerometers Focus groups	Parental survey and focus groups Student survey (for peers)	GIS Analysis Questionnaires Maps	Teacher Survey Focus Groups School Principals' interview

Figure 2. The BEATS Study: Conceptual framework, outcome measures and assessment procedures

The BEATS Study will take place between February 2014 and June 2015. The study has been funded by the University of Otago Research Grant, Dunedin City Council and internal grants from the School of Physical Education, Sport and Exercise Sciences.

The BEATS Research Team is welcoming collaborators, postgraduate students and volunteers to join the team.

For more information about the BEATS Study, please visit our study website.
The website provides information for schools, students, parents, teachers, researchers and policy makers.

www.otago.ac.nz/beats

Significance and Implications

The findings will provide valuable and unique information for schools, city councils, transport agencies and land planners.

The results from this study will inform:

- Future interventions for built environment change,
- Education campaigns,
- School policy development, and
- City policy development.

Collaboration

Figure 3. The BEATS Study is a collaboration between the University of Otago, the Dunedin Secondary Schools' Partnership and the Dunedin City Council.

BEATS Research Team

Principal Investigator:
Dr Sandy Mandic, School of Physical Education, Sport & Exercise Sciences

Associate Investigators:
Dr Tony Moore, School of Surveying, University of Otago
Dr John Williams, Department of Marketing, University of Otago
Prof John C Spence, University of Alberta, Edmonton, Canada
Dr Enrique García Bengoechea, McGill University, Montreal, Canada
Dr Tara Duncan, Department of Tourism
Dr Debbie Hopkins, Postdoctoral Research Fellow
Charlotte Flaherty, Dunedin City Council
Dr Harriette Carr, Ministry of Health, Wellington

Project Coordinator: Ashley Mountfort, BSc

BEATS Study Website

www.otago.ac.nz/beats

BEATS Study School Recruitment: 100% (12 schools)

Data Collection in Schools (2013-2015)