BEATS Symposium 2020
Proceedings

Editors: Sandra Mandic and Kirsten Coppell
University of Otago | Dunedin | New Zealand
18 February 2020
Acknowledgments

The Built Environment and Active Transport to School (BEATS) Research Programme is an interdisciplinary and multi-sector collaboration between the University of Otago, the Dunedin Secondary Schools' Partnership, Otago Secondary Schools' Principals' Association and the Dunedin City Council. The programme was initiated in 2013.

The BEATS Study (2014-2018) was funded by the Health Research Council of New Zealand (Emerging Researcher First Grant 14/565), the National Heart Foundation of New Zealand (grants 1602 and 1615), a Lottery Health Research Grant (grant 341129), an University of Otago Research Grant (UORG 2014), Dunedin City Council and internal grants from the School of Physical Education, Sport and Exercise Sciences, University of Otago. The BEATS Rural Study (2018-2019) is supported by an University of Otago Research Grant (UORG 2018) and the Otago Energy Research Centre (Seed Grant 2018). The BEATS Natural Experiment (BEATS-2 Study) is supported by the Health Research Council of New Zealand Project Grant (19/173) and internal grants from the Division of Science and School of Physical Education, Sport and Exercise Sciences, University of Otago.

The BEATS Symposium 2020 is supported by the University of Otago Research Group Award 2019.
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Dear Colleagues,

Welcome to the BEATS Symposium 2020 held on 18 February 2020 in Dunedin, New Zealand.

This symposium has been designed to celebrate interdisciplinary and multi-sector research collaborations and to share the BEATS Research Programme findings to date. It brings together individuals from academia, government, public health, urban design, transportation and environment to share knowledge and discuss challenges and opportunities for encouraging active transport to school.

As organisers, we hope that during this symposium you will:

- Learn about BEATS Study findings to date and future directions
- Gain insights from BEATS Study investigators, collaborators, research students and symposium attendees
- Exchange ideas about opportunities for encouraging active transport in urban and rural areas
- Engage in an interdisciplinary and multi-sector dialogue about active transport, and
- Extend your networks beyond the discipline(s) and sector(s) you currently work in.

Here are a few programme details:

- 1 full action-packed day
- 17 abstracts
- 15 speakers
- Registration is free.

Thank you for joining us. We hope you will enjoy this symposium, gain new knowledge, become inspired, make new friends and take many new ideas to extend your current work.

Kind regards,
BEATS Symposium 2020 Organizing Committee

Associate Professor Sandra Mandic (Chair)
Active Living Laboratory
School of Physical Education, Sport and Exercise Sciences
University of Otago

Associate Professor Kirsten Coppell
Department of Medicine
Dunedin School of Medicine
University of Otago
Symposium Details

Dates and Location
18 February 2020
University of Otago
Dunedin | New Zealand

Symposium Venue
School of Physical Education, Sport and
Exercise Sciences
55 Union St West
Seminar Room 213/214
Dunedin, 9054
(see map)

Symposium Web Page
For detailed information, please refer to the BEATS Study website:
https://www.otago.ac.nz/beats/publications/otago726789.html

Sponsors and Support
This symposium is supported by the University of Otago
Research Group Award 2019. We also acknowledge the
great assistance of Kimberley King and the Division of
Sciences Marketing Team who helped with organising
this symposium.

A special thank-you to abstract reviewers Assistant
Professor Jennifer Roberts, Assistant Professor Ricardo
Oliveira and Dr Alberto Aibar.

Questions? Let us know…

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Dunedin 9054, NEW ZEALAND
Speakers

**Professor John Spence**  
Faculty of Kinesiology, Sport, and Recreation, University of Alberta, Edmonton, Canada

Professor Spence has expertise in theories of health behaviour, research methods and population health. His research focuses on the benefits and determinants of physical activity and how physical inactivity and sedentary behaviour are related to obesity. Recent work has examined the role of policy initiatives for promoting physical activity and reducing sedentary behaviour in Canada. For instance, he has led evaluations on the effectiveness of tax credits and a micro-grants program to support children’s access to physical activity and sport.

**Associate Professor Melody Smith**  
The School of Nursing, University of Auckland, Auckland, New Zealand

Aspirations for neighbourhoods where children can be independently mobile, where people can get around safely by walking and cycling, and where social and physical well-being is prioritised and facilitated are key drivers of Melody’s research. Most of this work involves the integration of objective measurement of behaviours and outcomes (e.g., accelerometry, inclinometry, GPS, GIS), as well as person-centred methods (participatory planning, online mapping). Melody considers herself fortunate to work with amazing researchers and students across a range of innovative projects that contribute to understanding the links between built and social environments and health and well-being in children and their families.

**Assistant Professor Ricardo Oliveira**  
Institute of Physical Education and Sports, Rio de Janeiro State University, Brazil

Graduated in Physical Education from Rio de Janeiro State University (UERJ), Ricardo has a PhD in Exercise Physiology from Gama Filho University/Stanford University. Ricardo is a coordinator of the Laboratory of Active Living (LaVA) from UERJ, a Deputy Coordinator of the Postgraduate Program in Exercise and Sports Sciences of UERJ and the Principal Investigator of the Let’s Grow Active Project. He currently collaborates with the Laboratory of Sustainable Mobility from Rio de Janeiro Federal University School of Architecture and the Active Living Laboratory at the University of Otago, New Zealand. Ricardo has expertise in the fields of cardiovascular physiology, physical activity promotion, clinical epidemiology and public health.
**Associate Professor Sandra Mandic**  
Active Living Laboratory, School of Physical Education, Sport and Exercise Sciences, University of Otago, Dunedin, New Zealand

Interdisciplinary and multi-sector approaches to physical activity and health with links to transportation, built environment and sustainability inspire Sandy's academic activities. Her academic training and professional experiences span Europe, Canada, the United States and New Zealand. Sandy is the academic leader of the Active Living Laboratory, the principal investigator on the BEATS Research Programme, the director of the Transport Research Network Research Theme and a Research Affiliate of the Centre of Sustainability at the University of Otago.

**Associate Professor Kirsten Coppell**  
Dunedin School of Medicine, University of Otago, Dunedin, New Zealand

Associate Professor Kirsten Coppell is a Public Health Physician. Her primary research focus is public health approaches to diabetes prevention, particularly community-based lifestyle approaches. Other research interests include prediabetes, non-alcoholic fatty liver disease (NAFLD), and nutrition. Kirsten’s current interdisciplinary research projects also include the PIP: Prediabetes intervention package in primary care, and the Delivering optimal weight gain advice to pregnant women – the DOT study. Kirsten is the NZ College of Public Health Medicine Training Programme Supervisor for the South Island. She joined the BEATS Research Team in 2017.

**Associate Professor Debbie Hopkins**  
The Transport Studies Unit, School of Geography and the Environment, University of Oxford, Oxford, United Kingdom

Associate Professor Debbie Hopkins is an environmental social scientist and human geographer, working on socio-spatial experiences and practices of mobility with a particular focus on socio-technical transitions to a low-carbon transport system. Debbie previously worked at the Centre for Sustainability at the University of Otago on the Energy Cultures II project. Her research interests include modal shift from motorised to active modes, urban freight delivery, and the emergence of automated vehicle technologies. Debbie is an Associate Investigator on the BEATS Research Programme, leading qualitative investigations of active transport to school.
**Associate Professor Susan Sandretto**  
College of Education, University of Otago, Dunedin, New Zealand

Dr Susan Sandretto works at the University of Otago where she contributes to education studies and teacher education programmes at the undergraduate and postgraduate levels, teaches qualitative research and supervises at the postgraduate level. Her research interests include critical multiliteracies, critical literacy, gender issues in education, second language and practitioner research. Her book, *Planting seeds: Embedding critical literacy into your classroom programme* (NZCER Press, 2011) was the result of three years of research with primary and secondary teachers. Susan is a former primary school teacher.

**Dr Christina Ergler**  
School of Geography, University of Otago, Dunedin, New Zealand

Dr. Ergler’s research interests are at the intersection of geography, sociology and public health, and centre on how physical, social and symbolic environments shape and are shaped by the way people play, live, age, fall ill and recover in particular places. She has published numerous theoretical and methodological pieces to alert stakeholders and communities to the socio-spatial, structural and experiential dimensions of people’s health and wellbeing in transforming urban environments.

**Tessa Pocock**  
The School of Nursing, University of Auckland, Auckland, New Zealand

Tessa Pocock has a Bachelor of Physical Education with Honours and has recently completed her Masters of Physical Education (both at the University of Otago, Dunedin) as an extension of the BEATS Study. Tessa was involved in the data collection and coordination of the BEATS Parental Survey. Her research interests include disability studies, urban design and physical activity promotion across all ages and abilities. Tessa is currently completing PhD studies at the School of Nursing (The University of Auckland, Auckland) where she is exploring environments of community-dwelling older adults in relation to ‘positive ageing’ in place.
**Long Chen**  
School of Surveying, University of Otago, Dunedin, New Zealand

Long Chen is currently in his second year of his PhD research at the University of Otago. His research focuses on applying spatial analysis and geovisualisation methods and models in understanding active transport choices of adolescents in Dunedin through space and time. Long finished his Master’s at the University of Edinburgh (Land use detection of Lowland Savana in Belize) and his Bachelor (Surveying) in China at the Southwest University of Science and Technology.

**Mohammad Lutfur Rahman**  
Active Living Laboratory, School of Physical Education, Sport and Exercise Sciences, University of Otago, Dunedin, New Zealand

Lutfur is starting the second year of his PhD research at the University of Otago. His research interests include adolescents’ active transport, transport infrastructure planning, and land use planning. Lutfur’s PhD research focuses on modelling safe walking and cycling routes for adolescents in Dunedin, New Zealand. Lutfur is a student representative for the Transport Research Network Research Theme, University of Otago. He completed a Master of Philosophy in Urban Transport Infrastructure Planning at Queensland University of Technology (QUT), Brisbane, Australia.

**Margaretha Liliana Situmorang**  
Active Living Laboratory, School of Physical Education, Sport and Exercise Sciences, University of Otago, Dunedin, New Zealand

Margaretha Liliana Situmorang started her PhD at the University of Otago as of February 2020. Her research examines transport modes to school and its association with food outlets and dietary behaviour among adolescents as part of the overall BEATS Natural Experiment Study. Margaretha previously completed her Master’s in Architecture with specialisation in Sustainable Urban Design at Lund University, Sweden. She has professional experience working with Infrastructure Research Institute Indonesia and has done consultancy work for urban road safety and sustainable human settlements project with several governmental institutions in Indonesia.
Ahmad Izanloo
Active Living Laboratory, School of Physical Education, Sport and Exercise Sciences, University of Otago, Dunedin, New Zealand

Ahmad Izanloo is a PhD student who will be joining the Active Living Laboratory and the BEATS Research Team in early 2020. He holds a Bachelor's degree in Urban Planning from the University of Bojnourd (Iran) and a Master's degree in Urban and Regional Planning from Allameh Tabataba'i University (Iran). His research interests include non-motorised transportation, public health and interdisciplinary topics. As part of the BEATS Natural Experiment, Ahmad’s PhD research will be focusing on synthesising subjective and objective measures of transport to school behaviours and physical activity in Dunedin adolescents.

Brittany White
Active Living Laboratory, School of Physical Education, Sport and Exercise Sciences, University of Otago, Dunedin, New Zealand

Brittany White is a Master’s student who completed a Bachelor of Physical Education with Honours at the School of Physical Education, Sport and Exercise Sciences at the University of Otago. Her Master’s and Honours research projects were part of the BEATS and BEATS Rural Studies. Progression through her university studies has inspired her to be a catalyst for positive change throughout the community. As of January 2020, Brittany started her new role as the ‘Future Women in Sport and Active Recreation Graduate’ at Sport New Zealand in Wellington.

Jessica Calverley
Active Living Laboratory, School of Physical Education, Sport and Exercise Sciences, University of Otago, Dunedin, New Zealand

Jessica Calverley is a Master’s student at the School of Physical Education, Sport and Exercise Sciences at the University of Otago. She also holds a Postgraduate Diploma in Science (Cardiophysiology) and a Bachelor of Science (Physiology, Microbiology) from the University of Otago. Her Master’s research examined rural adolescents’ perceptions of walking and cycling to school as part of the BEATS Rural Study.
Kimberley King
Active Living Laboratory, School of Physical Education, Sport and Exercise Sciences, University of Otago, Dunedin, New Zealand

Kimberley King works as the BEATS Research Coordinator at the School of Physical Education, Sport and Exercise Sciences, University of Otago. Her expertise is in the area of Public Health and Sport Development. Kimberley managed and delivered the Ministry of Health initiative Green Prescription for the Otago region from 2009-2016, working alongside general practitioners, nurses, hospital specialist, physical activity and health providers and the Southern District Health Board. Kim has extensive work experience in the implementation and coordination of physical activity health intervention programmes and developing multidisciplinary collaborations between health, education, community and sport sectors.
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<td>09:30</td>
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| 10:00      | Welcome (Mihi whakatau)  
  University of Otago Research Group Award 2019 presentation  
  Professor Richard Blaikie, Deputy Vice-Chancellor Research and Enterprise, University of Otago |
| 10:15      | From a Pilot Project to a Multidisciplinary Research Programme: Lessons Learned from the Six-Year BEATS Research Journey  
  Associate Professor Sandra Mandic, University of Otago |
| 10:30      | Keynote lecture: Motives for Physical Activity: A Further Delineation of FUN  
  Professor John Spence, University of Alberta, Canada |
| 11:00      | Exercise break |
| 11:10      | Comparison of Physical Activity Patterns among Adolescents Living in Large, Medium and Small Urban Areas and Rural Settings of Otago, New Zealand  
  Brittany White, University of Otago |
| 11:20      | A Conceptual Framework for Modelling Safe Walking and Cycling Routes to Secondary Schools  
  Mohammad Lutfur Rahman, University of Otago |
| 11:30      | Perceptions of Walking versus Cycling to School among New Zealand Adolescents Living in Rural Areas  
  Jessica Calverley, University of Otago |
| 11:40      | Exploratory Spatial Analysis of Active Transport to School Patterns among Dunedin Adolescents  
  Long Chen, University of Otago |
| 11:50      | School Neighbourhood Built Environment Assessment for Adolescents’ Active Transport to School: Modification of an Environmental Audit Tool (MAPS Global)  
  Tessa Pocock, University of Auckland |
| 12:00      | Active Transportation and Health: A Brazilian Team Jumping into a New Exciting World  
  Assistant Professor Ricardo Oliveira, Rio De Janeiro State University, Brazil |
| 12:15      | Lunch |
| 13:00      | Adolescents’ Dietary Patterns and Obesity-Promoting Food Environments across Otago, New Zealand  
  Associate Professor Kirsten Coppell, University of Otago |
| 13:10      | Adolescents and their Aspirations for Private Car-Based Transport  
  Associate Professor Debbie Hopkins, University of Oxford, UK |
| 13:20      | The Role of Networks, Social Support and Community Cohesion for Young People’s Active Transport and Independent Mobility in Rural Otago, New Zealand  
  Dr Christina Ergler, University of Otago |
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<td><strong>Competing Tensions: Active Transport to School, School Choice and Policy Making</strong></td>
<td>Associate Professor Susan Sandretto, University of Otago</td>
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<td>13:40</td>
<td>Why do so few adolescents take the bus to school in Dunedin?</td>
<td>Dr Christina Ergler, University of Otago</td>
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<td><strong>Exercise break</strong></td>
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<td>14:00</td>
<td>Built Environment Changes and Active Transport to School among Adolescents: BEATS Natural Experiment Study Protocol</td>
<td>Associate Professor Sandy Mandic, University of Otago</td>
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<td>14:10</td>
<td>A Proposed Study Synthesising Subjective and Objective Measures of Adolescents' Transport to School Behaviours, School Route Characteristics and Transport-Related Physical Activity</td>
<td>Ahmad Izanloo, University of Otago</td>
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<td>14:20</td>
<td>Food Outlets Availability, Dietary Behaviours and School Travel Patterns in Adolescents</td>
<td>Margaretha Liliana Situmorang, University of Otago</td>
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<td>14:30</td>
<td><strong>Afternoon tea</strong></td>
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<td>15:00</td>
<td>An Integrated Hierarchy of Social and Built Environment Needs for Children's Active Travel to School: Triangulation of Findings from New Zealand Studies</td>
<td>Associate Professor Melody Smith, University of Auckland, New Zealand</td>
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<td>15:20</td>
<td>“Community Engagement - Value, Impact and Advocacy”</td>
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<td>Closing discussion</td>
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<td><strong>Closing and informal conversations</strong></td>
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Abstracts

From a Pilot Project to a Multidisciplinary Research Programme: Lessons Learned from the Six-Year BEATS Research Journey

Sandra Mandic1, Debbie Hopkins2, Enrique García Bengoechea3, Kirsten Coppell1, Antoni Moore1, Susan Sandretto1, Christina Ergler1, Michael Keall4, Anna Rolleston5, Gavin Kidd6, Gordon Wilson6, Charlotte Flaherty1, Stacey Hitchcock7, Melody Smith8, Finau Taungapeau9, Sara Connolly10, Janet Stephenson1, Kimberley King9, Javier Molina-García11, Ana Queralt11, Palma Chillon12, Jennifer S. Mindell13, John C. Spence14.

1University of Otago, Dunedin, New Zealand; 2University of Oxford, Oxford, United Kingdom; 3University of Limerick, Limerick, Ireland; 4University of Otago, Wellington, New Zealand; 5University of Waikato, Hamilton, New Zealand; 6Dunedin Secondary Schools’ Partnership, Dunedin, New Zealand; 7Dunedin City Council, Dunedin, New Zealand; 8The University of Auckland, Auckland, New Zealand; 9Pacific Peoples Community, Dunedin, New Zealand; 10Stantec, Dunedin, New Zealand; 11University of Valencia, Valencia, Spain; 12University of Granada, Granada, Spain; 13UCL (University College London), London, UK; 14University of Alberta, Edmonton, Canada.

Background: Environmental changes and effectively translating knowledge to increase rates of active transport require time, strong relationship-building skills, extensive collaborations and a cross-sector approach. The Built Environment and Active Transport to School (BEATS) Research Programme (www.otago.ac.nz/beats) in New Zealand is an interdisciplinary and multi-sector programme designed to advance scientific knowledge about adolescents’ travel to school and to provide service to government, local community and schools.

Description: The research programme is guided by ecological models for active transport that account for individual, social, environmental, and policy factors. In six years (2013-2019), the programme grew from a pilot project to the BEATS, BEATS Rural, and BEATS Natural Experiment Studies with several spin-off projects. BEATS research has been widely disseminated, advanced scientific knowledge across several disciplines, and demonstrated important impacts locally/nationally/internationally. A community-based participatory approach with the sustained involvement of key stakeholders enabled a generation of end-user relevant data, and facilitated the translation of knowledge into evidence-based policy and planning. Lessons learned include: getting the right people on board; designing and running projects as win-win; aiming high and planning for success; delivering on promises; giving back and delivering value; extending the vision and the team; and having fun during the journey.

Conclusions: The BEATS Research Programme is an exemplary model of a successful community-academia research partnership. Such partnerships require time, appropriate funding, long-term commitment and continuing evolution to adapt to challenges, embrace new opportunities, deliver relevant outputs, remain sustainable in the long-term and translate knowledge into evidence-based practice and policy.

Keywords: Active transport, adolescents, physical activity, built environment.

Highlights:
- In six years, the BEATS research grew from a pilot project to a research programme.
- Involving the right people and designing/running projects as win-win were essential.
- Aiming high, delivering on promises and providing value were also important.
- Extending the vision and the team and having fun during the journey were vital.
- The BEATS programme is a successful community-academic research partnership.
Public health initiatives have been relatively ineffective in convincing the majority of populations in most developed and developing countries to engage in regular physical activity. One reason for this failure is that physical inactivity and sedentary behavior are assumed to be irrational, when, in fact, being sedentary is rational (e.g., saving energy) and exercise is irrational (e.g., expending energy) from an evolutionary perspective. Therefore, a paradigm shift is required. For instance, according to most of the health behavior theories that are used to guide interventions, people will be irrational in choosing to engage in a behavior that is not good for their health. However, humans are present biased and often place a high premium on their time and prefer immediate pleasure over long-term health gains. Furthermore, engaging in exercise can be uncomfortable, uses much energy, and can result in injuries. Thus, for most people, avoiding exercise is a very rational decision. To be consistent with these evolutionary explanations of physical activity/inactivity, the motives for physical activity should be FUN: Fulfilling (e.g., play, sports, social engagement, boredom avoidance, self-actualization), Useful (e.g., saves time or money, explore the environment, rehab from injury or illness), or Necessary (part of the job, put food on the table). In this presentation I will discuss factors that influence FUN including the energetic cost of activity, value of time (cost of time), and opportunity and potential implications for interventions and public health initiatives.
Comparison of Physical Activity Patterns among Adolescents Living in Large, Medium and Small Urban Areas and Rural Settings of Otago, New Zealand

Brittany White¹, Enrique García Bengoechea², John C. Spence³, Kirsten Coppell¹, Sandra Mandic¹

¹University of Otago, Dunedin, New Zealand; ²University of Limerick, Limerick, Ireland; ³University of Alberta, Edmonton, Canada

Background: About one-fifth of adolescents are meeting physical activity (PA) guidelines globally. Knowledge of adolescents’ PA patterns comes mostly from studies conducted in urban settings. This study compared accelerometer-measured PA patterns in adolescents from Otago, New Zealand living in large (n=237), medium (n=45) and small (n=44) urban areas or rural settings (n=51).

Methods: Adolescents (n=377; age: 14.9±1.4 years; 66.8% female; 23 Otago secondary schools) completed an online survey and anthropometry and had valid accelerometer data (≥5 days/week, ≥10 hours/day).

Results: Overall, the adolescents participated in 54.4±21.0 minutes of moderate-to-vigorous physical activity (MVPA) daily and 35.0% met PA guidelines (school day versus weekend day: 40.8% vs. 26.0%; p<0.001). A greater proportion of adolescents meeting PA guidelines were males (43.2% vs. 31.9%; p=0.016), and those participating in school sports (70.1% vs. 54.0%; p=0.005) and using active transport to school (40.2% vs. 26.1%) compared to their counterparts. No differences existed by geographical setting in the proportion of adolescents meeting PA guidelines (large/medium/small urban area; rural: 37.1%; 40.0%; 29.5%; 25.5%; p=0.312) or average daily MVPA (54.7±21.0; 57.5±20.5; 52.8±16.9; 52.0±24.4 min; p=0.577).

Compared to rural adolescents, adolescents in large urban areas spent more time sedentary (584.9±84.7 vs. 527.8±88.2 min/day; p<0.001) and accumulated more MVPA during the school commute time (before school: 8.3±6.7 vs. 5.3±3.8 min, p<0.001; after school: (10.1 ± 6.0 vs. 7.7 ± 4.3 min; p=0.003).

Conclusions: PA in Otago adolescents is low with significant differences by gender, sport participation and school travel mode. PA should be encouraged in both urban and rural adolescents.

Keywords: Adolescents; urban; rural; physical activity; accelerometers

Highlights:
- Moderate-to-vigorous physical activity (MVPA) levels were low among all adolescents.
- No differences existed in MVPA between geographical settings.
- MVPA during school commute time was higher in urban versus rural adolescents.
- Adolescents from large urban areas were more sedentary than those from rural areas.
A Conceptual Framework for Modelling Safe Walking and Cycling Routes to Secondary Schools

Mohammad Lutfur Rahman, Antoni Moore, Sandra Mandic.

University of Otago, Dunedin, New Zealand.

Background: Safe route to school interventions that aim to encourage walking and/or cycling to school are promising strategies to increase adolescent rates of active transport to school. Multiple factors influence whether adolescents walk and/or cycle to school. This study presents a comprehensive conceptual framework for modelling safe walking and cycling routes to school for adolescents.

Description: The framework has been developed based on the existing relevant frameworks including: a) the ecological models which account for individual, social, environmental and policy factors as well as traffic and personal safety considerations; b) the Five E’s framework of transport planning which includes engineering, education, enforcement, encouragement, and evaluation components; and c) travel mode choice framework for school travel which consist of urban form, mediating and moderating factors. The framework identifies built environment features (land use mix, walking/cycling infrastructure, neighbourhood aesthetics, and accessibility to local facilities) and traffic safety factors (traffic volume and speed, streetlights, safe road crossings, and quality of roadway surface) to consider when modelling safe walking/cycling routes to secondary schools.

Implications: The framework suggests that modelling of safe school routes should address the built environment features and traffic safety concerns. This framework needs to be tested using actual data in different geographical settings. To be effective, modelling and creation of safe routes to secondary schools should be complemented by other interventions including education, enforcement, and encouragement to minimize safety concerns. Future research should utilize multiple tools for assessing the school route built environment features including Geographic Information Systems and environmental scans.

Keywords: School; safe route; active transport; walking; cycling; built environment; traffic safety; framework; adolescents

Highlights:
- A conceptual framework is developed for modelling safe routes to high schools.
- The framework is guided by the ecological models for active transport.
- The Five E’s and travel mode choice to school frameworks are also incorporated.
- Built environment and traffic safety need to be considered.
- The framework needs to be tested in different geographical settings.
Perceptions of Walking versus Cycling to School among New Zealand Adolescents Living in Rural Settings

Jessica Calverley¹, Debbie Hopkins², Enrique García Bengoechea³, Kirsten Coppell¹, John C. Spence⁴, Sandra Mandic¹

¹University of Otago, Dunedin, New Zealand; ²University of Oxford, Oxford, United Kingdom; ³University of Limerick, Limerick, Ireland; ⁴University of Alberta, Edmonton, Canada

Background: Walking and cycling to school have been extensively studied in urban settings, whereas data from rural areas remains sparse. This study examined perceptions of walking and cycling to school amongst rural New Zealand adolescents living ≤4.8 km of school and therefore not eligible for a subsidised school bus.

Methods: Adolescents (n=71; 15±1.5 years; 8 secondary schools) residing in rural areas (population <1,000) completed an online survey about their perceptions of walking and cycling to school. Home-to-school distance was calculated using Geographic Information Systems.

Results: Among rural adolescents living ≤4.8 km from school, 63% walked and 13% cycled to school. Compared to cycling, adolescents reported greater desire (53% vs 24%) and intention (66% vs 13%) to walk to school and perceived more support from friends (71% vs 30%) and parents (74% vs 38%) (all p<0.001). Adolescents also reported better infrastructure support (presence/availability of footpaths vs cycle lanes) (79% vs 32%, p<0.001) for walking versus cycling to school. Trip duration, distance, and cold/wet weather were perceived as more common barriers for walking than for cycling to school. Over 90% of rural adolescents perceived both walking and cycling to school as safe.

Conclusions: Compared to cycling, walking to school was a more common and preferred transport mode with greater social and infrastructural support whereas both modes were perceived as safe by rural adolescents living within 4.8 km from school. Findings suggest that supportive social and built environments encourage walking to school. Mode-specific approaches may be required to encourage cycling to school.

Keywords: Active transport; walking; cycling; rural; adolescents; perceptions

Highlights:
- Compared to cycling, walking to school was more common among rural adolescents.
- Adolescents had more favourable perceptions of walking than cycling to school.
- Walking to school received greater social and infrastructural support than cycling.
- Over 90% of adolescents perceived walking and cycling to school as safe.
- Mode-specific approaches may be required to encourage cycling to school.
Exploratory Spatial Analysis of Active Transport to School Patterns among Dunedin Adolescents

Long Chen, Antoni Moore, Sandra Mandic.

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Background: Geographical Information Science (GIS) is widely applied in analysing human activities. GIS can be useful for understanding the factors that influence children’s use of active transport to school (ATS). This study examined the associations between ATS and factors affecting ATS using exploratory spatial analysis methods.

Methods: Kernel Density Estimation (KDE) was used to derive distribution maps of transport mode patterns and ATS factors. The results of KDE were compared and verified by Local Indicators of Spatial Association (LISA). By comparing the results of KDE and LISA, spatial relationships between ATS and ATS factors were detected.

Results: Distribution patterns (e.g. spatial clusters) indicated that ATS factors including home-to-school distance, gender, co-educational school attendance and neighbourhood deprivation index, home neighbourhood residential density and intersection density were associated with ATS rates over space. Body mass index and ethnicity did not show association with ATS. With the exception of mixed land use entropy, LISA results confirmed KDE results.

Conclusions: Factors including distance, gender, co-educational school attendance, neighbourhood deprivation index, residential density and intersection density demonstrated spatial association with ATS rates among adolescents. These results will be used in a future study to examine the relationship between ATS and factors associated with ATS using quantitative spatial analysis. In particular, these exploratory spatial analysis results will inform Dunedin-specific model building using Geographically Weighted Regression.

Keywords: Active transport; school; Geographical Information Science; spatial analysis; Kernel Density Estimation; Local Indicators of Spatial Association; distance

Highlights:
- Home-to-school distance was a key factor associated with active transport to school.
- Gender and co-educational school attendance showed similar spatial patterns.
- Residential and intersection density were related to active transport rates.
- Neighbourhood deprivation was also associated with active transport in Dunedin.
School Neighbourhood Built Environment Assessment for Adolescents’ Active Transport to School: Modification of an Environmental Audit Tool (MAPS Global)

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Background: The school neighbourhood built environment (SN-BE) can influence adolescents’ active transport to school habits. Commonly, SN-BEs are evaluated using micro-scale (i.e., environmental audit tools) or macro-scale assessment (i.e., Geographic Information Systems (GIS)). The present study evaluated the inter-rater reliability and feasibility of using a modified environmental audit tool and protocol, Microscale Audit of Pedestrian Streetscapes Global–School Neighbourhood (MAPS Global-SN), to assess the SN-BE of twelve secondary schools in Dunedin, New Zealand. In addition, correlations between MAPS Global-SN and GIS measures of the SN-BE were examined.

Methods: SN-BE assessment included an environmental audit (MAPS Global-SN) and GIS spatial analysis over a 0.5 km street-network buffer-zone around each school. Inter-rater reliability was assessed by calculating the intraclass correlation coefficient (ICC). The feasibility of a condensed audit protocol (auditing one side of each school neighbourhood street segment, compared to both sides) was also assessed. Data were analysed using Pearson’s Product Moment Correlations and Spearman’s Rank Correlation Coefficient.

Results: MAPS Global-SN tool had good to excellent inter-rater reliability (assessed sub-scales: ICCs=0.60-0.99) and the condensed audit protocol sufficiently represented the micro-scale SN-BE. Results also highlighted the complementary nature of micro- and macro-scale assessments. Recommendations for future SN-BE assessment will be discussed.

Conclusions: MAPS Global-SN tool and condensed protocol may be a feasible alternative to micro-scale SN-BE assessment, simplifying data collection procedures and reducing time/resource commitment for school neighbourhood assessment. Future studies should consider SN-BE audit protocols proportional to the time and resources available and complement MAPS Global-SN assessment with GIS analysis.

Keywords: Active transport; adolescents; built environment; environmental audit; Geographic Information Systems; school.

Highlights:
- Modified MAPS Global-SN is a feasible alternative to school neighbourhood audits.
- GIS measures of the school neighbourhood complement MAPS Global-SN audits.
- Inter-rater reliability of this tool modification was good to excellent.
- Recommendations and considerations for future use of the tool are provided.
Active Transportation and Health: A Brazilian Team Jumping into a New Exiting World

Ricardo Oliveira
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Inspired by the BEATS Study, Dr. Oliveira will present how his research interests have evolved in the last 15 years, crossing different fields, from exercise physiology and clinical epidemiology to public health and particularly, to the Active Living field. He will present three of his current projects.

‘Corporate travel plan, social justice, and health: the case of a lubricants corporation in Brazil’ found that 48.8% of the sample takes more than 2 hours to get to work from home. The most common modes of transport to work were public transport (53.6%) and private car (26.4%). Only 7.9% of the workforce walked or cycled to work. Obese and insufficiently active individuals (engaging in less than 150 min/week of moderate-to-vigorous physical activity) were less likely to use active transportation to work compared to their counterparts.

‘The Health Economic Impact of a Bike Share System in Brazil’ study included analysis of 3,678,043 bicycle trips and 319,693 cyclists from six Brazilian capitals. The 10 years health economic impact of the bike share system was estimated to be US$2,238,476,190.48. Overall, 2528 premature deaths would be prevented in 10 years. If the bike share system increases the number of cyclists by 15% compared to its current number, it would result in an additional health economic impact of US$327,592,380.95 in 10 years.

‘Let’s Grow Active Study – Built Environment and Active Transportation to School’ will examine the interaction between the social inequalities, transport choices, built and natural environments, physical activity levels (of parents, children and adolescents), and weight status in children and adolescents of public schools of Rio de Janeiro.

Dr. Oliveira will highlight preliminary results and some challenges faced as a consequence of social and political characteristics of Brazil.

**Keywords:** Active transport, health, physical activity, bike share systems.
Obesity and Environment: Adolescents’ Dietary Patterns in Different Settings across Otago, New Zealand

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**Background:** More than one-third of New Zealand (NZ) adolescents are overweight or obese. Fast-food outlets that cluster around NZ schools in urban areas have increased since the 1960s, particularly in high deprivation areas. We examined dietary patterns among adolescents attending secondary schools in different geographical and deprivation settings in the Otago region, NZ.

**Methods:** Adolescents (n=1441; age: 15.3±1.4 years; 53.2% females; 11.4% Māori) from large (n=850), medium (n=154) and small (n=269) urban areas, and rural areas (n=138) (defined by population size) completed an online survey about their dietary habits. Height and weight were measured, body mass index calculated and categorised (healthy and overweight/obesity). The NZ Index of Deprivation defined five deprivation categories. Comparisons were made using ANOVA and Chi-square tests.

**Results:** Overall, 26.3% of adolescents were overweight/obese, with marked differences across neighbourhood deprivation categories (least to most deprived: 22.5%/21.7%/27.7%/32.9%/34.0%; p=0.005), and non-significant differences across geographical settings (large/medium/small urban and rural areas: 28.2%/24.7%/22.3%/23.2%; p=0.190). Significant differences were observed across the four geographical settings in the consumption of sweets ≥5 days/week (23.1%/19.5%/22.7%/10.1%; p=0.025), sugary drinks ≥5 days/week (17.8%/14.9%/11.9%/9.4% p<0.001) and fast foods ≥2 days/week (18.1%/20.1%/15.2%/7.2%; p=0.008). Those in the most deprived neighbourhoods were significantly less likely to consume fruit (p=0.019) and vegetables (p<0.001) ≥5 days/week, and more likely to consume sugary drinks (p=0.013) and fast foods (p<0.001).

**Conclusions:** Overweight/obesity rates among adolescents differ by neighbourhood deprivation level, and dietary patterns differ across geographical and deprivation settings in Otago. A better understanding of obesity-promoting environments could inform obesity prevention policies and actions.

**Keywords:** Obesity; adolescents; neighbourhood environments; dietary behaviours

**Highlights:**
- Adolescents’ rates of unhealthy weight differ by neighbourhood deprivation level.
- Junk food consumption was more frequent in urban versus rural adolescents.
- Adolescents in more deprived neighbourhoods consumed less fruit and vegetables.
- Better understanding of obesity-promoting environments could inform future actions.
Adolescents and their Aspirations for Private Car-Based Transport

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Background: The need to transition away from the current car-dominated transport system is well documented in sustainability, health and transportation literatures. Despite growing interest in active and public transport modes, the car still dominates travel preferences for most age groups. There is, however, some evidence of declining preferences for car-based travel for younger generations. This paper explores adolescents’ aspirations for motorised forms of transport, and examines whether norms and practices which help to replicate automobility (e.g. aspirations for car ownership) are evident in this cohort of teenagers.

Methods: This paper presents and interprets findings from a quantitative survey of adolescents (n=1240) and qualitative focus groups (n=10 focus groups, 54 participants) in Dunedin, New Zealand. The research adopts a ‘convergent parallel’ or ‘concurrent triangulation’ mixed method research design. This involves the concurrent but separate collection and analysis of both quantitative and qualitative data, allowing the researchers to gain greater understanding of the research problem at hand.

Results: Contrary to somewhat optimistic reports of reduced aspiration for driving and cars, we find evidence of ongoing preference for car-based transport, and intentions to learn to drive. The findings signal the importance of socialisation processes and everyday travel decisions for long term aspirations to replicate practices of automobility.

Conclusions: Our findings have important implications for interventions to increase non-motorised mobilities, and reduce dependence on private vehicles across the transport system. Tackling everyday mobility practices will be important to achieve long-term, systemic transitions away from high-carbon and unsustainable transport modes (e.g. private car travel).

Keywords: Adolescents; socialisation; automobility; mode choice; motorised transport.

Highlights:
• There is sustained preference for private motorised transport amongst adolescents.
• Socialisation processes contribute to aspirations for motorised transport.
• Mobility practices need to be tackled to increase use of active and public modes.

Publication:
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The Role of Networks, Social Support and Community Cohesion for Young People’s Active Transport and Independent Mobility in Rural Otago, New Zealand

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Background: To combat the health burden of insufficient physical activity in adolescents, promotion of active transport (AT) is an easy and effective intervention to integrate physical activity into adolescents’ everyday life. Independent mobility (IM) is associated with AT. Although only a few studies discuss specifically the links between AT and IM, their general consensus is that IM increases the use of AT. Social capital and social trust, as well as perceived dangers (e.g. traffic or strangers), play an important role for parents to grant licenses for AT and IM. This study examined the influence of social capital on AT and IM in adolescents living in a rural area under the umbrella of networks, social support and community cohesion.

Methods: We conducted interviews with 20 parents and 10 focus groups with 67 adolescents from the rural Otago region, New Zealand. Thematic qualitative analysis was utilized to explore the data.

Results: Findings show the importance of social capital in adolescents' licenses, habit creation and levels of IM and AT in rural areas. The two main factors related to AT and IM of adolescents in rural areas were perceptions of stranger and traffic danger, both coming down to a lack of social trust. The parental perception of social capital decline observed in this study was similar to previously reported decline in urban areas, which goes against the perceived notion of social ties and communities being stronger in rural areas.

Conclusions: Social capital and social trust had major influence in adolescents' licenses for AT and IM in rural areas. To be effective in rural areas, health policies targeted at increasing adolescents’ physical activity (through AT and IM) should also consider social capital.

Keywords: Independent mobility; active transport; social capital; social trust

Highlights:
- Youth’ transport choices and independent mobility was influenced by social capital.
- Parents perceived a decline in social capital in rural areas since their childhood.
- Stranger and traffic danger related to active transport and independent mobility.
- Social capital should be included in health policy targeting physical inactivity.

Publication:
Competing Tensions: Active Transport to School, School Choice and Policy Making

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Background: School choice policies in Aotearoa New Zealand have had a direct impact on active transport to and/or from school (ATS), with clear consequences of increased distance to school, and decreased rates of ATS. In this paper, we explore the complex relationship between ATS, school choice and policy making.

Methods: Twelve secondary school leaders from an Aotearoa New Zealand urban centre (principals, n=11, or deputy principals, n=1; 50% females) participated in an individual, 45-60 minute semi-structured interview to explore perceptions of ATS, the school neighbourhood environment, and school policy making. The interviews were audio-recorded, transcribed verbatim and imported into the qualitative data analysis software HyperResearch. Interview coding followed a general inductive approach.

Results: We found the increased travel distance to school has become taken-for-granted in a school choice policy context. All school leaders named at least three barriers to ATS including topography, weather, school uniforms and safety. School leaders located decision-making around ATS with parents/guardians, and were reticent to impose any school-level policies to encourage ATS that might adversely affect school enrolments. Despite the identified challenges, interviewees suggested promise in collaborative work with students to develop policies to mitigate the negative effects of school choice on ATS.

Conclusions: Our findings speak to policy-makers and researchers interested in increasing ATS rates among adolescents within a school choice policy context. Future initiatives to develop policies to encourage ATS will need to involve students themselves as participants to support school leaders to negotiate the competitive school choice policy context.

Keywords: Active transport, school, adolescents, school choice, school policy making

Highlights:
- School choice policies increase distance to school and reduce active travel rates.
- School leaders were aware of main barriers to active transport to/from school.
- Many school leaders viewed school travel as a family decision and choice.
- Active school travel policies have not been in the school leaders’ ‘field of view’.
- Future efforts to encourage active school travel should involve students.
Why Do so Few Adolescents Take the Bus to School in Dunedin?

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Background: Transport to school can contribute significantly to adolescents' physical activity but in New Zealand many adolescents are driven to school. We examined environmental, policy and personal factors plus perceptions of barriers and enablers of public transport to school among Dunedin adolescents in Dunedin, the second largest city in South Island, New Zealand. Dunedin (population 130,000) is sprawling and hilly.

Methods: A mixed-method approach involving all 12 Dunedin secondary schools used: the public bus survey from Otago School Students Lifestyle Survey (1398 adolescents); Built Environment and Active Transport to School study parental survey (350 parents), focus groups (54 adolescents, 25 parents, 12 teachers) and semi-structured interviews (12 principals); interviews with three policy-makers from local/regional/national agencies; and analysis of 10 relevant local/regional/national strategies/transport plans.

Results: Distance to school, cost, parental trip chaining, built environment features, the weather, convenience, and safety perceptions represent major barriers to Dunedin adolescents using public transport to school. Current transport planning documents do not favour public health. Enticing adolescents to use public transport for school travel is challenging in a car-dominated society. However, stakeholders noted a slow but positive change, with new investment in buses and technology to increase the user-friendliness of public transport and address some of the barriers mentioned by students, parents and school principals.

Conclusions: Raising parking prices to discourage parents driving and trip-chaining; improving bus infrastructure and services; subsidies; and changing perceptions could increase public transport use. These require collaboration between different government authorities.

Keywords: Public buses; adolescents; New Zealand; school travel; active travel; secondary schools

Highlights:
- There are major barriers to Dunedin adolescents using public transport to school.
- Barriers include trip distance, cost, trip chaining, built environment and the weather.
- A public bus policy is needed to address parental, student and school concerns.
- Government authorities, schools, parents and adolescents need to work together.
Built Environment Changes and Active Transport to School among Adolescents: BEATS Natural Experiment Study Protocol

Sandra Mandic¹, Debbie Hopkins², Enrique García Bengoechea³, Antoni Moore¹, Susan Sandretto¹, Kirsten Coppel¹, Christina Ergler¹, Michael Keall⁴, Anna Rolleston⁵, Gavin Kidd⁶, Gordon Wilson⁶, Stacey Hitchcock⁷, Melody Smith⁸, Finau Taungapeau⁹, Sarah Connolly¹⁰, Janet Stephenson¹¹, Kimberley King¹, John C. Spence¹.¹

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Background: Natural experiments are considered a priority for examining causal associations between the built environment (BE) and physical activity (PA) because the randomised controlled trial design is rarely feasible. Few natural experiments have examined the effects of new cycling infrastructure on PA and active transport in adults, and none have examined the effects of such changes on PA and active transport to school (ATS) among adolescents. Since 2014, on-road and off-road cycling infrastructure construction has occurred in the neighbourhoods of six out of 12 secondary schools in Dunedin, New Zealand. Pedestrian-related infrastructure changes began in 2018. As a follow-up on the original Built Environment and Active Transport to School (BEATS) Study conducted in Dunedin in 2014–2015, the BEATS Natural Experiment (BEATS-NE) (2019–2022) will examine the effects of cycling and pedestrian infrastructure changes on adolescents’ ATS.

Methods: The BEATS-NE Study will be guided by contemporary ecological models for active transport that account for individual, social, environmental, and policy factors. The published BEATS Study methodology (surveys, accelerometers, mapping, Geographic Information Science analysis and focus groups) and novel methods (environmental scan of school neighbourhoods and participatory mapping) will be used. A core component will continue to be the community-based participatory research approach with the sustained involvement of key stakeholders to generate locally relevant data, and facilitate knowledge translation into evidence-informed policy and planning.

Conclusions: The natural experiment design and comprehensive data collection will extend current knowledge to inform planning of future school-, neighbourhood- and city-wide BE changes to encourage ATS in adolescents.

Keywords: Active transport, adolescents, physical activity, built environment, natural experiment.

Highlights:
- This natural experiment is an extension of the original Dunedin-based BEATS Study.
- Device-based assessments of physical activity and the built environment are included.
- Novel methods include environmental scans of school areas and mapping sessions.
- The community-based participatory research approach remains a core component.
- Results will inform future environment interventions to promote active transport.
A Proposed Research Synthesising Subjective and Objective Measures of Adolescents' Transport to School Behaviours, School Route Characteristics and Transport-Related Physical Activity

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Background: Active transport to/from school (ATS) can be a form of physical activity (PA) in adolescents. Most previous studies examining school travel in adolescents have used subjective measures of school travel, PA, the built environment (BE) and school routes. Few studies have used objective measurements or used a combination of objective and subjective measurements for these variables. This doctoral research will examine adolescents’ transport to school behaviours, school route characteristics, adolescents’ use of new cycling infrastructure and transport-related PA using a combination of objective and subjective methods.

Methods: As part of the Built Environment and Active Transport to School Natural Experiment (BEATS-NE) Study, additional data will be collected in a subset of adolescents who complete the BEATS-NE student survey. Objective measurements will include Geographic Information System (GIS) data analysis of the BE features of home and school neighbourhoods and school route, Global Positioning System (GPS) assessment of school route(s) and 7-day accelerometer measured PA. Subjective measurements will include survey responses to assess school travel patterns and annotated maps to assess adolescents’ perceptions of safety along their school route. School route data obtained from annotated maps, GIS and GPS measurements will be compared.

Implications: This research will contribute to advancing current methods for synthesizing data collected using GIS, GPS and accelerometers to describe school travel-related PA and the influence of the BE. Findings will extend the current literature related to transport-related PA and school route choice among adolescents using different modes of transport to school.

Keywords: Adolescents; transport; school; physical activity; built environment; Global Positioning System

Highlights:
- Objective and subjective methods will be used to examine adolescents’ school travel.
- Objective assessments will include GIS, GPS and accelerometer data.
- Transport-related physical activity will be determined from accelerometers and GPS.
- School route characteristics and use of new cycling infrastructure will be assessed.
- School route data from GIS, GPS and maps annotated by students will be compared.
Background: Obesity in children and adolescents is a major health issue. Physical inactivity and poor dietary habits are contributing factors. While active transport to and from school (ATS) contributes to physical activity levels in adolescents, it may be associated with an increased intake of unhealthy fast foods and sugar-sweetened beverages. The availability of convenience stores, fast food outlets, unhealthy food advertising in school neighbourhoods, especially along routes to and from school, may be associated with unhealthy dietary behaviours among adolescents, particularly among those using ATS. This doctoral research will examine whether different modes of transport to school are associated with different food purchasing and dietary habits among adolescents.

Methods: This research will use data from the BEATS Rural Study (rural Otago, New Zealand; 2018) and BEATS Natural Experiment (Dunedin, New Zealand; 2020-2021). Data will include relevant adolescent survey items (demographic characteristics, modes of transport to/from school, health behaviours, and perceived school neighbourhood environment), anthropometry measurements, Geographic Information Systems (GIS) analysis of the school neighbourhood built environment, and environmental scans of school neighbourhoods using MAPS Global Tool (urban schools only). This research will also use GIS analysis of food outlet availability and density within 400m, 800m, and 1200m street buffer in urban and rural secondary schools, and site surveys on the presence of food advertising around and en-route to/from secondary schools. General dietary habits and food purchasing behaviours on the school journey will be compared between rural and urban adolescents. The results will provide information on possible negative outcomes of ATS on dietary behaviours among adolescents.

Keywords: Adolescents; dietary behaviour; food outlets; food purchasing; transport to school.

Highlights:
- Active transport to/from school may be associated with unhealthy dietary behaviours.
- Adolescents’ food purchasing and dietary habits to/from school will be examined.
- The availability of food outlets in the school neighbourhoods will be mapped.
- Presence of food advertising in the school neighbourhoods will be examined.
An Integrated Hierarchy of Social and Built Environment Needs for Children's Active Travel to School: Triangulation of Findings from New Zealand Studies

Melody Smith¹, Erika Ikeda², Greer Hawley³, Suzanne Mavoa⁴, Jamie Hosking¹, Victoria Egli¹, Jinfeng Zhao¹, Lisa Mackay², Niamh Donnellan¹, Rebecca Amann¹, Hamish Mackie³, Karen Witten⁵.

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Background: New Zealand (NZ) children’s active school travel (AST) has declined over recent years and is low internationally. While considerable evidence for factors related to children’s AST exists, a holistic and context-specific understanding remains elusive. The aim of this presentation is to triangulate multiple data sources to generate a model that enables a comprehensive understanding of AST associates in NZ children.

Methods: Data were drawn from a range of quantitative and qualitative studies conducted with NZ children, parents/caregivers, and school representatives, and studies examining objectively-assessed built environment characteristics in relation to AST. Findings were summarised, aggregated, and triangulated, with a focus on themes where consistent findings were observed across data sources or respondents. Links between variables were investigated and integrated into the final model.

Results: Distance from home to school and ensuring child safety were dominant factors associated with children’s AST. School policies, practices, partnerships and culture play an integral role in supporting children’s AST, and in some cases can mitigate environmental barriers. An active community culture, positive neighbourhood social relations, and links between the school and community are important elements to support AST.

Conclusions: This research demonstrates the complexity of AST and reinforces that interventions for increasing AST need to be multi-faceted and not isolated projects. Cross-sector approaches that are sustained over time are needed to facilitate meaningful change in AST. Strategic resourcing and national targets for AST rates may be effective ways to harness commitment across sectors and ensure actions to address the hierarchy of needs presented are operationalised.

Keywords: Mixed methods; active transport; neighbourhood environment, transport safety, geographic information systems

Highlights:
- Active school travel (AST) is low in New Zealand children
- Determinants of low active school travel are complex, as are potential solutions
- Distance to school and safety concerns are key barriers to active school travel
- School/community culture, partnerships, and practices are enablers of AST.
- Strategic resourcing for leadership and interventions is needed

Publication:
Collaborative Partnership Panel: “Community Engagement - Value, Impact and Advocacy”

Panellists:

- Gordon Wilson, former manager of the Dunedin Secondary Schools Partnership (retired), Dunedin, New Zealand
- Professor John Spence, University of Alberta, Edmonton, Canada
- Associate Professor Melody Smith, University of Auckland, Auckland, New Zealand
Physical and Spatial Assessment of School Neighbourhood Built Environments for Active Transport to School in Dunedin Adolescents

Tessa Pocock, Antoni Moore, Michael Keall, Sandra Mandic.

Highlights:
- Optimal distance for walking to school in Dunedin adolescents was ≤2.25 km.
- Dunedin secondary schools had similar school neighbourhood built environments.
-Near-school built environment did not correlate with active transport to school.
- Perceptions of school route correlated with near-school built environment features.
- Near-school built environment features may encourage active transport to school.


Built Environment Associates of Active School Travel in New Zealand Children and Youth: A Systematic Meta-Analysis Using Individual Participant Data

Erika Ikeda, Tom Stewart, Nicholas Garrett, Victoria Egli, Sandra Mandic, Jamie Hosking, Karen Witten, Greer Hawley, El Shadan Tautolo, Judy Rodda, Antoni Moore, Melody Smith.

Highlights:
- Distance to school was the strongest predictor of active travel to school
- Increased street connectivity around schools was related to active travel to school
- Dwelling density was negatively associated with active travel to school
- School socioeconomic status was negatively associated with school travel mode
- Distance to school is a key consideration for school zoning and catchment policies

School Bag Weight as a Barrier to Active Transport to School among New Zealand Adolescents

Sandra Mandic, Roman Keller, Enrique García Bengoechea, Antoni Moore, Kirsten Coppell.

Highlights:
- School bag weight was perceived as a barrier for active transport to school.
- Heavy school bags were seen as a greater barrier for cycling versus walking.
- Active transport users were less likely to report heavy school bags.
- On average, adolescents’ school bags weighted 5.6 kg.
- Actual school bag weights did not differ by mode of transport to school.


Would New Zealand Adolescents Cycle to School More if Allowed to Cycle without a Helmet?

Javier Molina-García, Ana Queralt, Enrique García Bengoechea, Antoni Moore, Sandra Mandic.

Highlights:
- 22% of youth stated they would cycle more to school if helmet use was not mandatory.
- Distance to school and route perceptions were identified as significant factors.
- Ethnicity and social norms emerged also as significant factors.
- Cycling often with friends explained additional variance.
- These findings can be used to design educational interventions for adolescents.


Clustering of (Un)Healthy Behaviors in Adolescents from Dunedin, New Zealand

Sandra Mandic, Enrique García Bengoechea, Kirsten J. Coppell, John C. Spence.

Highlights:
- Few Dunedin adolescents met recommended health behaviour guidelines, yet two-thirds had a healthy weight.
- This study identified six clusters based on health behaviours and weight status.
- Clusters had distinct sociodemographic and lifestyle characteristics.
- Future public health strategies for adolescents should be comprehensive and consider socioeconomic structural factors.
Adolescents' Perceptions of Cycling versus Walking to School: Understanding the New Zealand Context

Sandra Mandic, Debbie Hopkins, Enrique García Bengoechea, Charlotte Flaherty, John Williams, Leiana Sloane, Antoni Moore, John C. Spence.

Highlights:
- Low rates of cycling to school in New Zealand adolescents may be context-specific.
- Compared to walking, cycling to school was less common and perceived as less safe.
- Cycling also received less social and infrastructure support.
- More supportive physical and social environments are needed for promoting cycling.


Perceptions of Cycling amongst High School Students and their Parents

Debbie Hopkins, Sandra Mandic.

Highlights:
- Key findings relate to perceived safety, implicit messages, and social norms.
- A complex range of factors contributed to perceived safety of cycling, including features and perceptions of the built environment, traffic safety, previous cycling experiences and adolescents' cycling skills and on-road experiences.
- Overcoming concerns through behavioural and cultural interventions coupled with up-skilling and infrastructure changes may present a pathway to increasing cycling rates.

A Tale of Two New Zealand Cities: Cycling to School among Adolescents in Christchurch and Dunedin

Jillian Frater, John Williams, Debbie Hopkins, Charlotte Flaherty, Antoni Moore, Simon Kingham, Roeline Kuijer, Sandra Mandic.

Highlights:
- Despite higher rates of cycling to school in Christchurch than Dunedin, attitudes towards cycling to school are similar in both cities.
- Norms, capability, autonomy and intention to cycle were lower in Dunedin.
- Norms were the dominant influence in Christchurch and attitude in Dunedin.
- This study shows that norms, social needs and capability are relevant for adolescents’ cycling initiatives.


Attitudes towards Cycle Skills Training in New Zealand Adolescents

Sandra Mandic, Charlotte Flaherty, Tessa Pocock, Alex Mintoft-Jones, Jillian Frater, Palma Chillón, Enrique García Bengoechea.

Highlights:
- Little is known about adolescents’ attitudes towards cycle skills training.
- Over a third of adolescents perceived that cycle skills training could make them safer in traffic.
- Enjoyment, usefulness and desire to cycle were associated with a positive attitude towards cycle skills training.
- Parental behaviour and school’s encouragement were also important.
- Schools may be an appropriate setting for provision of cycle skills training to adolescents.


Parental Perceptions of Cycle Skills Training for Adolescents

Sandra Mandic, Charlotte Flaherty, Tessa Pocock, Kek Chiew Ching, Palma Chillón, Christina Ergler, Enrique García Bengoechea.

Highlights:
- Parents perceived cycle skills training would make adolescents safer in traffic.
- Parental perceptions of cycling to school as important and unsafe were essential.
- Having fewer vehicles at home was also associated with favourable perceptions.
- Parents thought adolescents would benefit from such training at their school.
- Interventions should capitalize on parental interest in cycle skills training.


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**“I Wanted to Go Here”: Adolescents’ Perspectives on School Choice**

Sandra Mandic, Susan Sandretto, Debbie Hopkins, Gordon Wilson, Antoni Moore, Enrique García Bengoechea

**Highlights:**
- New Zealand legislation removing school zones radically reshaped school choice
- The most common reasons for school choice included: preference for a co-educational school, school’s facilities, positive comments from parents/students and friends’ enrolment.
- Reasons for school choice differed by who is making the decision.
- Social factors and school programmes/facilities rather than proximity to home influence school choice decisions in Dunedin.


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**Enrolling in the Closest School or Not? Implications of School Choice Decisions for Active Transport to School**

Sandra Mandic, Susan Sandretto, Enrique García Bengoechea, Debbie Hopkins, Antoni Moore, Judith Rodda, Gordon Wilson

**Highlights:**
- Without school zoning, half of adolescents enrolled in the closest school.
- Distance to school and importance of school’s proximity influenced school choice.
- Co-educational school status and peer feedback were also important.
- Students attending closest school had five times higher rates of active transport.
- School choice has implications for education, health, transport and environment.

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Working together and learning from each other we can encourage walking and cycling to become a part of everyday lives in our towns and cities.

Thank you for joining us on this journey!

We look forward to continuing to work together with you.

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