



'Self Explaining Roads': Impact on physical activity and body size

Celia Kuch, Dr Melody Oliver, Dr Hannah Badland, Dr Mitch Duncan

May 2009

Life is like riding a bicycle. To keep your balance you must keep moving.

Albert Einstein



Who is involved?

Transport Engineering Research New Zealand (TERNZ) → SER treatments

Auckland City + Rodney District Councils → Funding

Centre for Physical Activity and Nutrition Research (CPAN) → Evaluation



A photograph of a city street featuring tram tracks in the center. On either side of the tracks, there are red-painted pedestrian crossings with white dashed lines. The street is lined with mature green trees and buildings in the background. A semi-transparent white box is overlaid on the image, containing text.

Aim

To improve the safety and sustainability of the urban environment by retrofitting ‘Self Explaining Roads’ (SER) treatments to existing urban roads.



Objectives



- Development and evaluation of Self Explaining Roads area-wide treatments.
 - The design of Self-Explaining Roads treatments to promote active transport modes.
- Unique opportunity to look at PA and health effects of CHANGING the physical road environment



Effects of the built environment on physical activity:



- Accumulate >30 mins/week more active transport in high walkable neighbourhoods.
- 1 unit BMI difference of high vs low walkable NH for high SES.
- Those who engage in active transport are more likely to be sufficiently active for health benefits.

Cerin, E., Leslie, E., du Toit, L., Owen, N., & Frank, L. (2007). Destinations that matter: Associations with walking for transport. *Health & Place*, 13(3), 713-724

Saelens, B., Sallis, J., Black, J., & Chen, D. (2003). Neighbourhood-based differences in physical activity: An environment scale evaluation. *American Journal of Public Health*, 93(9), 1552-1558

Badland, H., & Schofield, G. (2008). Health associations with transport-related physical activity and motorized travel to destinations. *International Journal of Sustainable Transport*, 2(2), 77-90

“burn calories, save cash, get there on time”



www.loveyourbike.org

Pre SER treatment Point England, Auckland



(Picture courtesy of TERNZ)



(Picture courtesy of TERNZ)

SER treatment (Point England, Auckland)



(Picture courtesy of TERNZ)

SER treatment (Point England, Auckland)



(Picture courtesy of TERNZ)

SER treatment (Point England, Auckland)



(Picture courtesy of TERNZ)

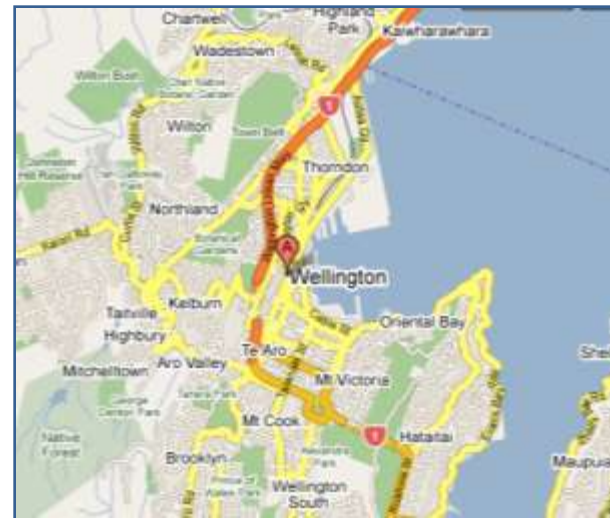
Pilot Study (Snell Beach, Warkworth)

- Conducted at one time point
- Primary aim: Test methodology
- 10 households (10 adults + 10 children)



Main Study (Hamilton/Wellington)

- Intervention Study (pre/post measures)
- Primary aim: Evaluate changes in PA, active travel modes, independent child mobility, body size, and environment perception
- 200 households (200 adults + 100 children)



Methods



- Overall physical activity
 - Actical Accelerometers (Mini-Mitter, Bend, OR)
 - International Physical Activity Questionnaire-Long Form (IPAQ-LF)
- Transport-related Physical Activity
 - GPS (BTS-110, Stars Navigation Technology, Taipei, Taiwan)
 - Children → commute route to school on paper-based maps plus roaming areas.



Trost, S., et al., *Using objective physical activity measures with youth: How many days of monitoring are needed?* *Medicine & Science in Sports & Exercise*, 2000. 32(2): p. 426-431

Craig, C., et al., *International physical activity questionnaire: 12-country reliability and validity.* *Medicine & Science in Sports & Exercise*, 2003. 35(8): p. 1381-95.

Rissotto, A. and F. Tonucci, *Freedom of movement and environmental knowledge in elementary school children.* *Journal of Environmental Psychology*, 2002. 22(1-2): p. 65-77.



Methods



- Neighbourhood perceptions: Abbreviated-Neighbourhood Environment Walkability Scale (A-NEWS).
- Streetscape: Systematic Pedestrian and Cycling Environmental Scan (SPACES) tool.

Cerin, E., et al., *Neighborhood Environment Walkability Scale: validity and development of a short form.* *Medicine & Science in Sports & Exercise*, 2006. 38(9): p. 1682-1691.

Pikora, T., et al., *Neighborhood environmental factors correlated with walking near home: Using SPACES.* *Medicine & Science in Sports & Exercise*, 2006. 38(4): p. 708-718.

Pikora, T., et al., *Developing a reliable audit instrument to measure the physical environment for physical activity.* *American Journal of Preventive Medicine*, 2002. 23(3): p. 187-194



Methods

- Demographics: Questionnaire for adults
- Body size: Height, Weight, Hip- and waist circumference.
- Weather: Recorded daily, accessed from the NZ Meteorological Service.



Subjects

Study population

- Adults (aged 18+) and children (aged 5-17) in private HHs along the treated roadways.

Exclusion criteria

- Severe walking mobility restrictions
- Minimal command of the English language
- Not willing to wear measurement units or answering the questionnaires



Study Protocol



Door-to-door recruitment approach

- Interview 1 (~10 minutes):
 - Introduction + consent
 - Accelerometers, GPS units
 - compliance logs
- Interview 2 (~50 minutes):
 - Administered self-report questionnaire
 - Collection of measurement units/compliance logs
 - Body size (height, weight, waist + hip circumference)

Projected Outcomes



Pilot study:

- Information regarding methodology practicality, participant compliance, timeframes, costs and data integration.

Main study:

- Answer questions regarding the environmental/streetscape design influence PA, health, travel behaviour and children's mobility.
- Combination of data from multiple sources meaningful?
- GPS findings → growing aspect of PA research.





Thank You! 😊

Bicycling is a big part of the future. It has to be. There's something wrong with a society that drives a car to workout in a gym. Bill Nye