Integrated Research Design for sustainable cities

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Mode share trends in four main modes of travel to work

- Total light vehicle
- Total public transport
- Bicycle
- Walking
Background

Urban environments/active transport research

Ogilvie et al – systematic review & iConnect
Macmillan et al – systematic review of OTPs
Rothman et al – systematic review children
Giles-Corti et al – RESIDE study
Keall, Chapman et al – ACTIVE study
Self Explaining Roads (SER) research

Auckland cycling policy simulations

Monetary impact of a regional cycle network compared with best practice (cycles separate from arterial roads & self explaining roads)

[Cyclist fatalities, Cyclist serious, Car crash fatalities, Physical activity related mortality, Greenhouse gas emissions, Fuel cost, Infrastructure cost]

Saving in NZ$M

Auckland Regional Cycle Network
SER
Combined best practice

Macmillan et al 2014 Environmental Health Perspectives. doi: DOI:10.1289/ehp.1307250
Future Streets Aims

With an equity focus,

1. demonstrate a *process* for design and implementation

2. Measure health, environmental, social effects of retrofitting low income suburban streets

3. model more generalisable costs and benefits

4. influence institutional change in transport policy
## Randomised controlled before-after intervention study

<table>
<thead>
<tr>
<th>Before</th>
<th>Intervention area</th>
<th>Control area</th>
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<tbody>
<tr>
<td></td>
<td>Mangere Central</td>
<td>Mangere East</td>
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<td><strong>Traffic behaviour</strong></td>
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<td>• Speed &amp; volume measures</td>
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<td>• Video of behaviour</td>
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<td>• Motorists, peds &amp; cyclists</td>
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<td>• Footpaths &amp; roads</td>
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<td><strong>Residents surveys</strong></td>
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<td>• Mode use to local destinations</td>
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<td>After</td>
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<td>• Physical activity</td>
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<td>• Neighbourhood perceptions</td>
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<td>• Injuries (self report &amp; data linkage)</td>
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<td>• Children &amp; adults</td>
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<td><strong>Air quality measurements</strong></td>
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<td>• NO₂ monitoring</td>
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Case and control areas were matched for:

- Access to amenity destinations
- Street layout and age of development
- Demographics
Methods

Identify intervention and control sites

Develop intervention designs with community 2013/14

Baseline measures at intervention and control sites

Build intervention modifications (2015/16)

Post intervention measures at both sites

Modelling and economic analysis

Dissemination

Measurement
- Air quality
- Household / school:
  - Physical activity
  - Health
  - Travel patterns
- Road Use:
  - Traffic counts/speed
  - Cyclist/Ped counts
  - Video of road user behaviour
Intervention area: Mangere Central
Participatory intervention development

- Community public meetings
- Mangere mall engagement
- Local Board engagement
- Qualitative focus groups with school children
- Go-along street interviews with local residents
- Community reference group
- Engagement with 4 local marae
- Working alongside AT designers in concept development
Baseline survey
Measuring pedestrian and cyclist movements

Wednesday

Saturday (market day)
Road user behaviour analysis
Route hierarchy
Different types of data and analysis

• Road user behaviour
• Traffic volume and speed
• Survey data
• Air quality measures
• Modelling
Research challenges

• Triangulating knowledges
• Community and researcher priority outcomes
• Transdisciplinary language and skills
• Adapting evidence to context
• Breaking investment process and “rules”
• Research – participation – construction timelines
• Process and design skills and knowledge mismatch
• Confronting myths – e.g. “culture” of cycling