An integrated system of public & private transport

Assoc. Prof. Simon Kingham
Dept of Geography and GeoHealth Laboratory
University of Canterbury
How we travel

% commuting

<table>
<thead>
<tr>
<th>Mode</th>
<th>1996</th>
<th>2001</th>
<th>2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>Worked at home</td>
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<tr>
<td>Did not work</td>
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<tr>
<td>Private car</td>
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<tr>
<td>Company car</td>
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<tr>
<td>Passenger</td>
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<tr>
<td>Bus</td>
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<tr>
<td>Train</td>
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<tr>
<td>Motor cycle</td>
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<tr>
<td>Bicycle</td>
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<td></td>
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<tr>
<td>Walked or jogged</td>
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</tbody>
</table>
Challenges

Climate change and peak oil are real problems
Potentially technology could solve them
But:
  * probably won’t
  * not in time
  * at a cost society won’t want to pay

But other major problem – HEALTH
Technology cannot solve them
Behaviour change is the key
The benefits of active & PT travel

Physical activity

Social capital
Evolution of the daily amount of physical activity in France

The benefits of active travel

Are transport-active countries healthier?
Figure 2 — Obesity (BMI ≥ 30 kg · m⁻²) prevalence and rates of active transportation (defined as the combined percentage of trips taken by walking, bicycling, and public transit) in countries of Europe, North America, and Australia. BMI was computed from self-reported height and weight. Data were obtained from national surveys of travel behavior and health indicators conducted between 1994 and 2006 (see text for details).

Who cycles most?
Figure 1. Bicycle share of trips in Europe, North America and Australia (percentage of total trips by bicycle).

Only for blokes?
Figure 8. Women’s share of total bike trips in Australia, the USA, the UK, Canada, Denmark, Germany and the Netherlands (2000–2005).

Cycling is dangerous?
Figure 10. Fatality rates and non-fatal injury rates in the Netherlands, Denmark, Germany, the UK and the USA (2004–2005).

Figure 12. Inverse trends in cycling fatality rates and annual kilometres cycled per inhabitant in the Netherlands (1950–2005).

Overall impacts

Overall positive health impacts

“On average, the estimated health benefits of cycling were substantially larger than the risks relative to car driving for individuals shifting their mode of transport”

- de Hartog et al, 2010, Do the health benefits of cycling outweigh the risks? EHP 118, 8, 1109-1116.

Economic sense

- Source: Cycling England, 2007, Valuing the Benefits of Cycling
“Substantial increases in bicycling require an integrated package of many different, complementary interventions, including infrastructure provision and pro-bicycle programs, supportive land use planning, and restrictions on car use”


It works

Small investment showed 27% increase in cycling in UK towns
What sort of cycle infrastructure?

1. What do non-cyclists want?
   
   Separation from traffic
   
   Significantly more attractive than anything else
   
   Consistency at junctions
   
   - Kingham S, Koorey G and Taylor K, 2011, Assessment of the type of cycle infrastructure required to attract new cyclists. NZTA Report TRV08/06.

   In city, and access to city
Public transport

High quality infrastructure

Subsidy?
cars directly pay 64% of their costs
trucks directly pay 56% of their costs
buses directly pay 68% of their costs
rail users directly pay 77% of their costs

Does not include exercise-related health!
Activity levels

PT travel includes walking

Canadian research shows “a transit trip involves 1250 steps, required to access and egress the network as well as to transfer between routes or modes”

A round trip (2500 steps) “account for 25% of the recommended volume of physical activity per day”


Social capital
Every US$1bn spent on PT produced 16,419 job months
Every US$1bn spent on highway infrastructure produced 8,781 job months

‘What we learned from the stimulus’ report (report based on US Congress House of Representatives Transportation and Infrastructure committee) Jan 2010.
Bus or rail

Bus is:
cheaper and easier to do
more flexible

Rail is:
preferred by users
avoids congestion
Carbon Emissions per Passenger-Mile (electricity from hydro)

- Modern Tram (Combino): 0.18 gCO2/kWh
- Trolleybus: 0.43 gCO2/kWh
- Skytrain: 0.38 gCO2/kWh
- LRT: 0.17 gCO2/kWh
- Articulated Diesel Bus: 45.6 gCO2/kWh
- Diesel Bus (40’): 59.4 gCO2/kWh
- Toyota Prius: 167.9 gCO2/kWh
- Ford Explorer: 370.9 gCO2/kWh

Source: Strickland, 2008; EPA, 2005; Spadaro et al. 2000
Can rail work in Christchurch?

Population size and density!
Smaller and less dense cities have light rail

Too expensive!

NZ spending over $10bn on new motorways

- Could build over 600-700km of light rail (based on Calgary price of $14-18m per km)

Future thinking
Integrated transport

Bus and rail linked
Park and ride
Including bikes
Bikes on PT
Not just random selection
Bike boulevards
Worst points are barriers
Transport and inequality

Communities that promote active and sustainable transportation can:
Reduce disparities between the rich and poor
Promote good neighbourhood
Enable poor to gain better access to healthy food.
Lead to decreased crime
  - OECD Project on Environmentally Sustainable Transport, 2002
Take home messages

Active and Public Transport are good for health
Active and Public Transport are good economic sense
Active and Public Transport reduce social inequality
Integrated transport is essential
Future thinking is essential
Plan for future not just for now
Provide quality choices
When you provide real choice people don’t always want to drive