Some transport research at VUW & the Centre for Sustainable Cities

Transport research colloquium

Ralph Chapman

14 Nov 2018

TE WHARE WĀNANGA O TE ŪPOKO O TE IKA A MĀUI
VICTORIA
UNIVERSITY OF WELLINGTON

new zealand centre for
Sustainable Cities
te pokapū rōnaki tāone-nui

Plan

1. Problems with transport in NZ – and the shape of solutions
2. Research by VUW and the NZ Centre for Sustainable Cities
3 .Reflections

Concept

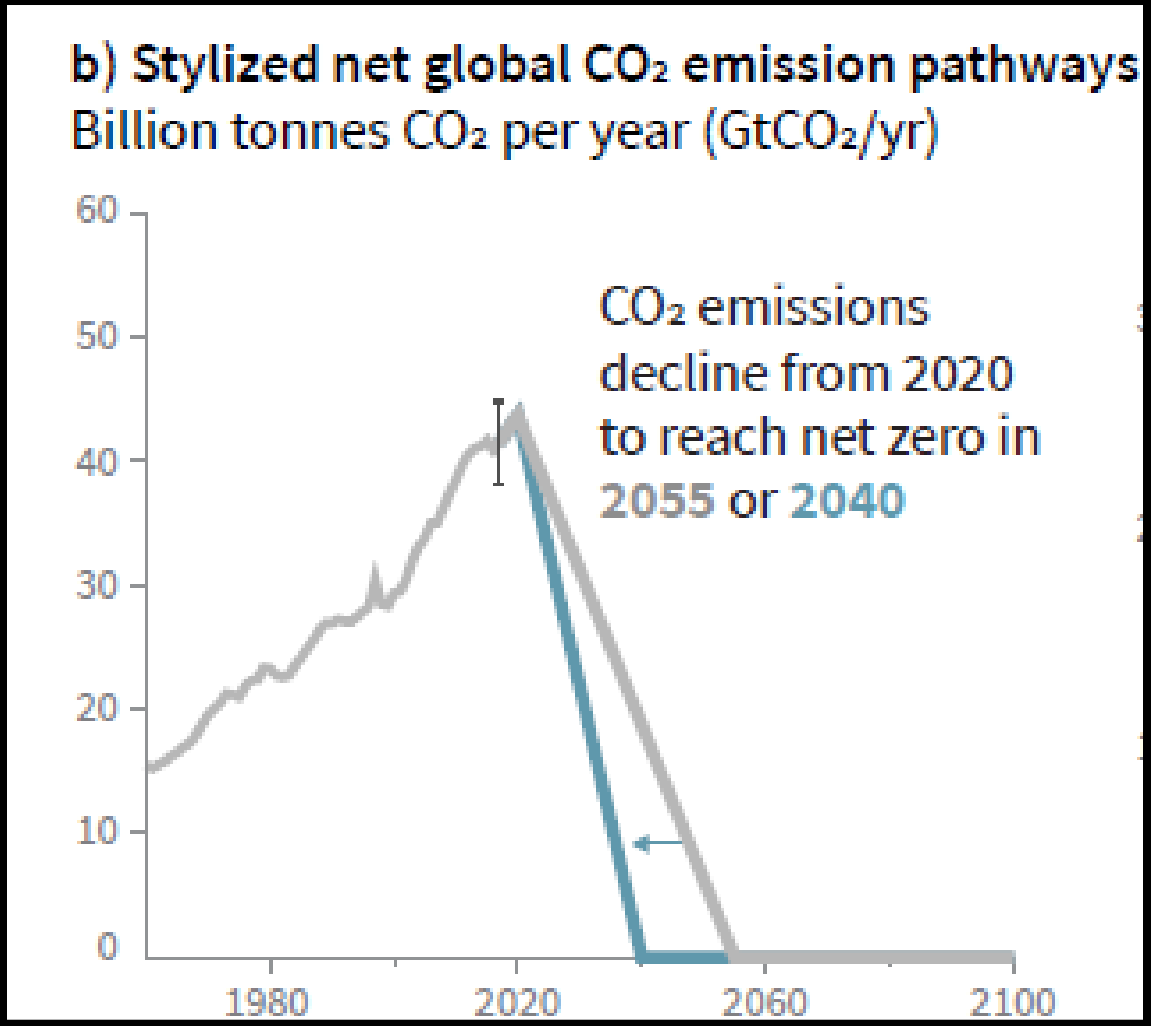
1 Problems with transport in New Zealand

Two major issues:

i) our transport-generated carbon emissions contribute a lot to (i.e. drive) climate change

ii) big costs of car-dominated urban transport – negative impact on physical activity, noise, congestion, cost of energy, cost of infrastructure, wasted space, etc.

The transition to sustainable cities and transport is a race against time



IPCC (2018): cut emissions urgently if we are to have even a slim chance of limiting warming to anything like 1.5C….

Mitigation urgency & transport

- Chance of going above 2C is possibly ~95%
- High risk of tipping points between 1.5 & 2C
- Long-term risks of 6-9 metres of SLR if go beyond ~ 2C
- Current policies pointed at around 3C !!

- Transport carbon emissions a particular policy vulnerability for NZ
- Need urgent attention: 82% rise 1990-2016: fastest growth of any major sector (MfE, 2018, p.8)
- Given this, *strong* case for CO_2 cuts being the key goal of transport policy

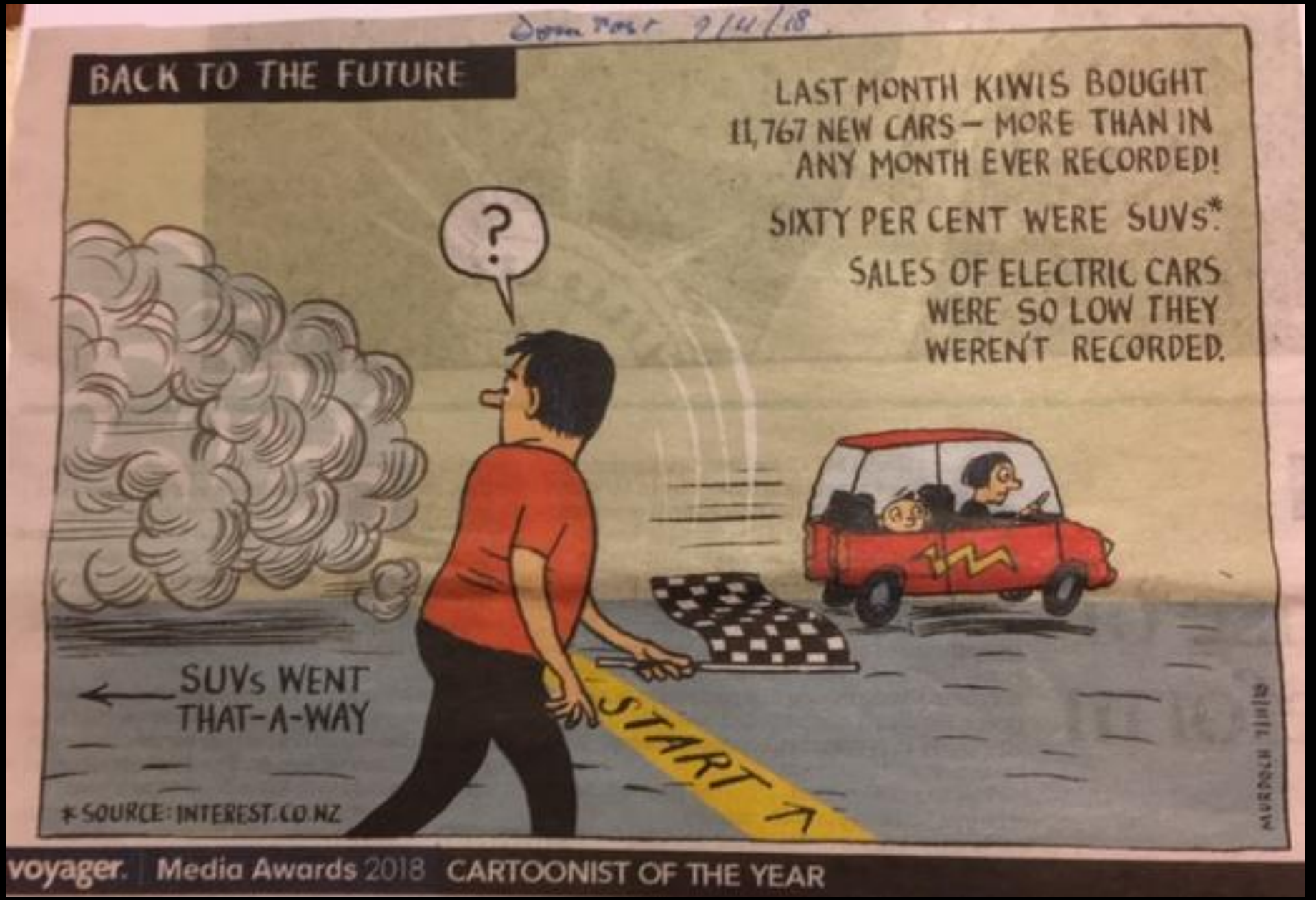
The shape of solutions…

- We will only cut transport emissions fast enough if we fully understand the problem, & commit to solving it

Key elements:

- Changes in funding priorities (GPS 2018)
- Policies to accelerate take-up of new transport technology and practices (e.g. EVs, car sharing)
- Reshaping our cities as fast as possible (e.g. with TOD)
- Rapid research & experiments to trial new ideas & policies

Dom Post 9/4/18.



voyager. | Media Awards 2018 CARTOONIST OF THE YEAR

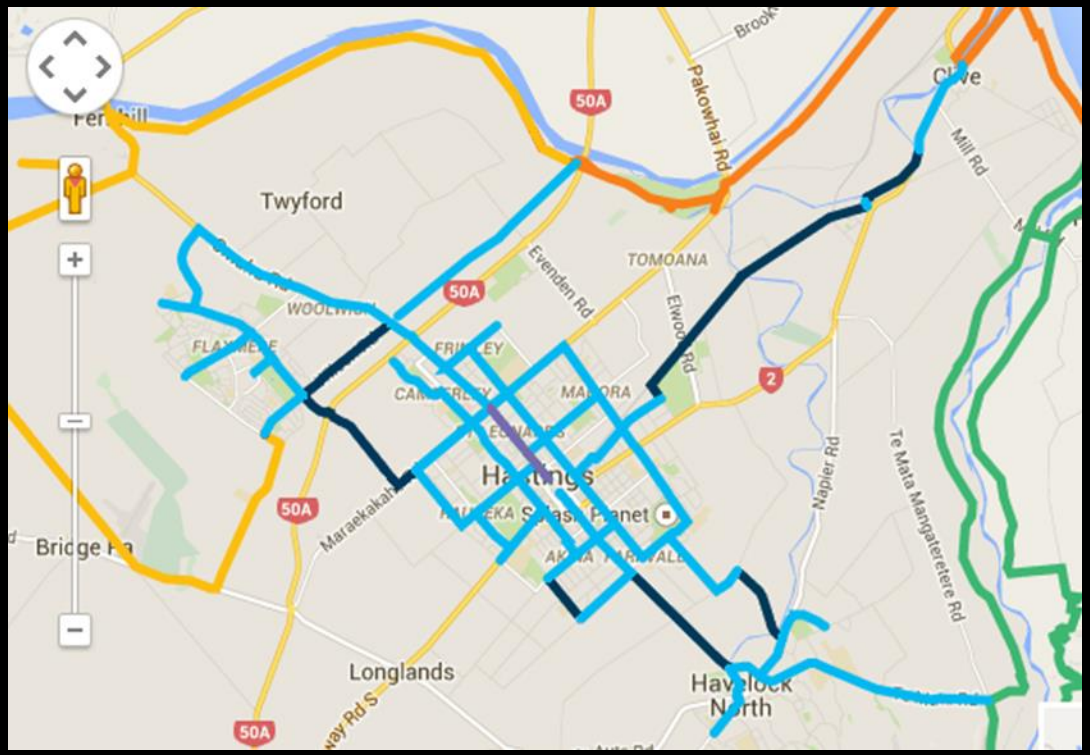
Global perspectives: the Global Commission on the Economy and Climate

‘All cities should commit to developing and implementing low-carbon urban development strategies by 2020, …

…prioritising policies and investments in public, non-motorised and low-emission transport, renewable energy...’

New Climate Economy reports, 2015 – 2018

2 Research at VUW and the NZ Centre for Sustainable Cities



http://www.iway.org.nz/routes-maps/

Cities in NZ: preferences, patterns and possibilities (2017)

FOUR

Why and how New Zealand cities could become more compact and sustainable

Ralph Chapman, Nadine Dodge, Kate Whitwell, Pattern Reid, Freddie Holmes, Chrissie Severinsen, Nicholas Preval, Ed Randal, Matt Adams & Lucia Sobiecki

Can more compact and accessible cities — with more people living in centrally located townhouses and apartments, a greater mix of land uses, and more use of sustainable transport — reduce New Zealanders' environmental impact and, at the same time, better meet our needs, including the need for high quality places to live?

Linkages between housing, neighbourhoods & travel mode choice

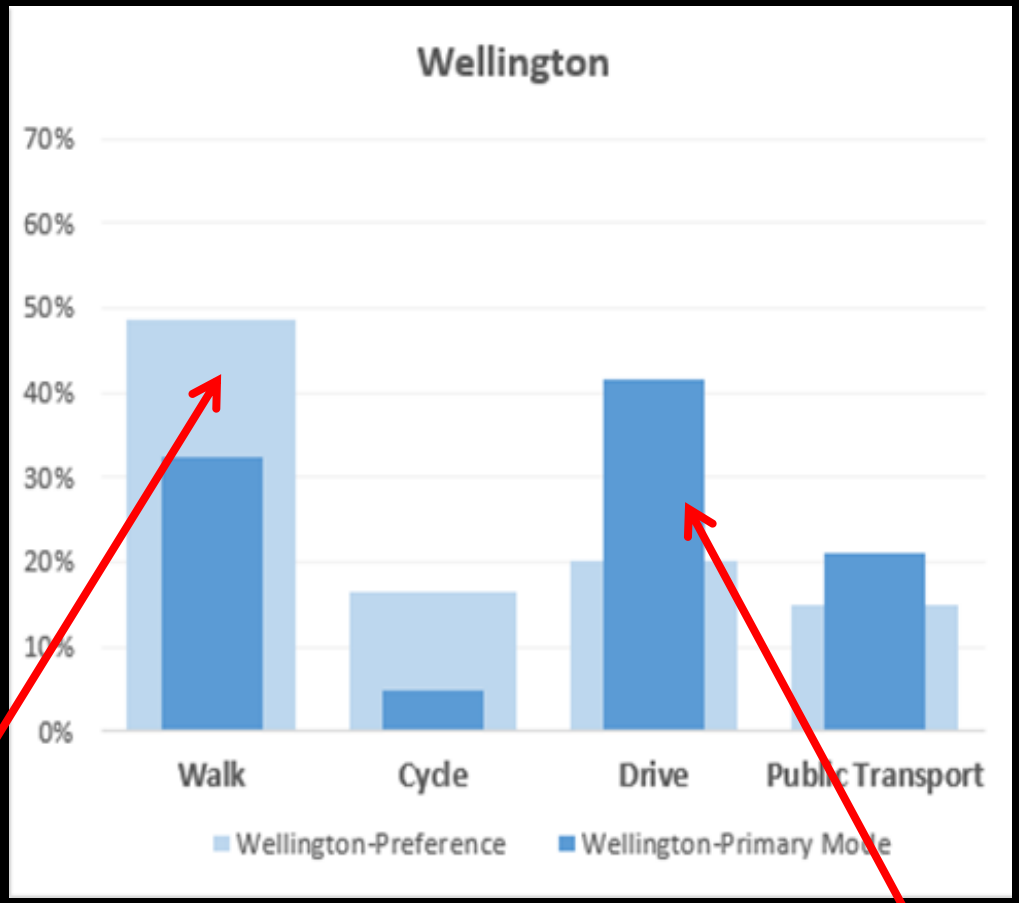
Dodge, N. (2017) A Quarter Acre Pavlova Paradise Lost? The role of preferences and planning in achieving urban sustainability in Wellington

A key finding:

In both Auck and Wgtn, preferences for driving are a lot less than people's current (actual) rate of driving.

Preferences and planning…

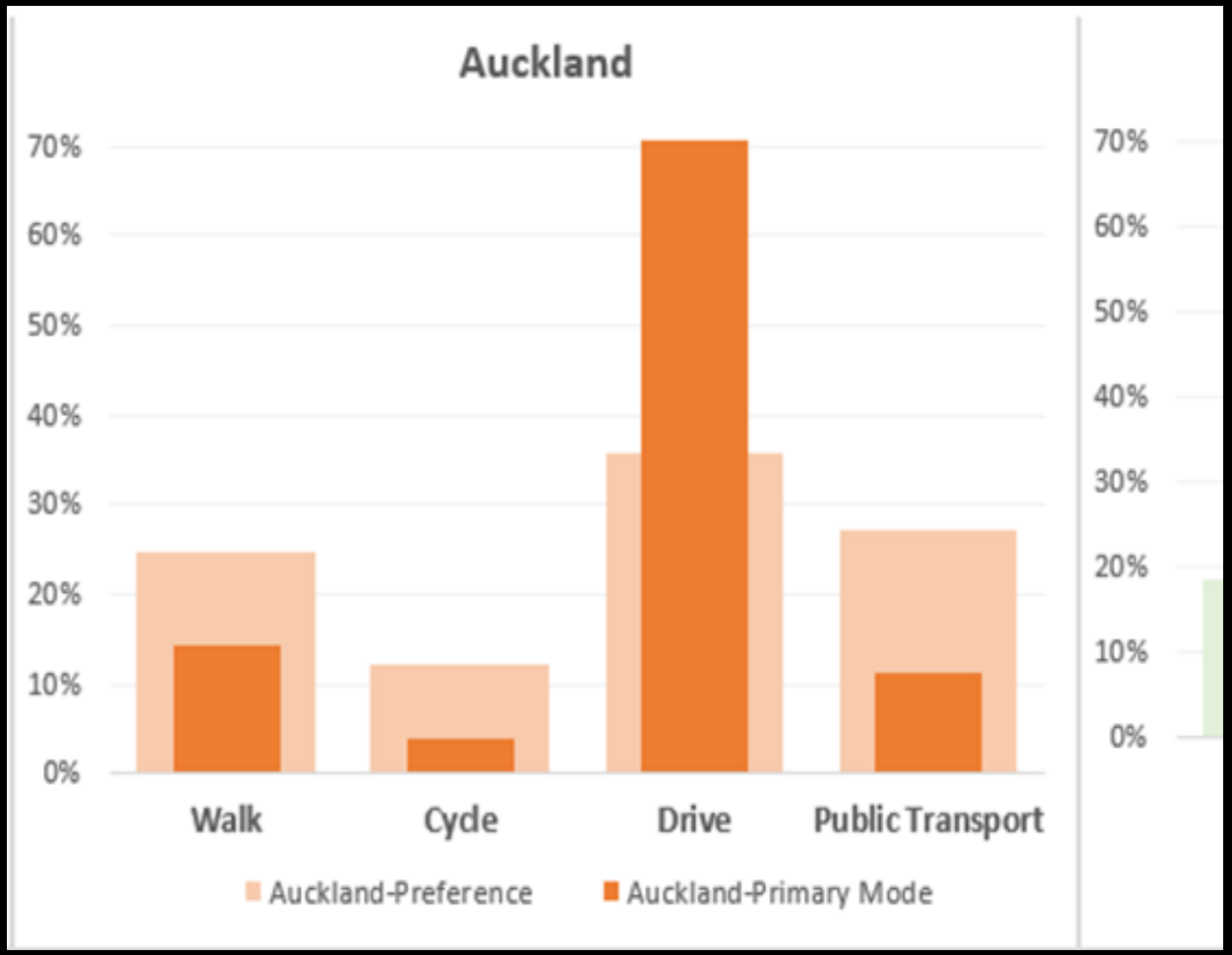
Limited transport choices available.



Markets don't always make available what people might choose

Preferences for transport modes compared to current primary transport modes (Sources: Dodge 2017; Holmes, Chapman and Dodge, 2017)

Preferences and planning…



Preferences for transport modes compared to current primary transport modes
(Sources: Dodge 2017; Holmes, Chapman and Dodge, 2017)

Promoting active travel

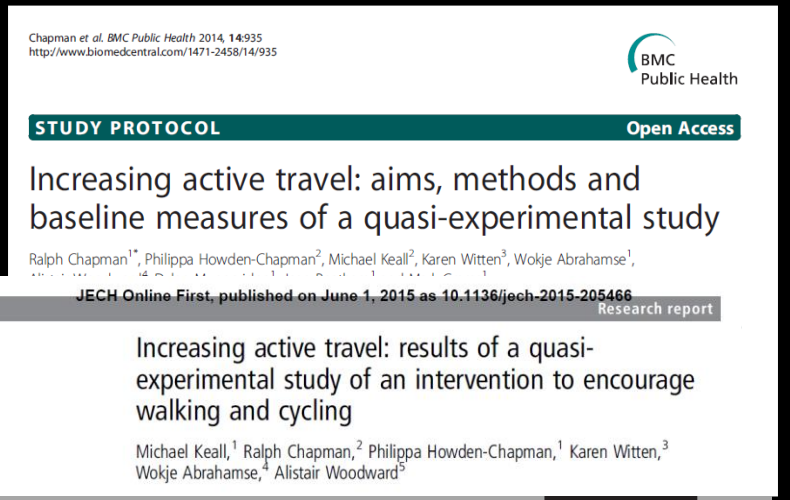
Model Communities Programme:

- Collab between councils & NZTA for each of Hastings and New Plymouth – for infrastructure, education, info
- Beneficial effect - stopped decline in active travel in Hstgs & New Plym
- Programme effect was to increase active travel by ~30%

ACTIVE project outputs

(all team efforts, but journal pubs led as below)

- Methods
  - Ralph
- Main results
  - Michael Keall
- Urban interventions
  - Philippa Howden-Chapman
- Cost-benefit analysis
  - Ralph
- Carbon benefits estimation
- Who responds most?
  - Michael



Chapman et al. BMC Public Health 2014, 14:935
http://www.biomedcentral.com/1471-2458/14/935

BMC Public Health

STUDY PROTOCOL Open Access

Increasing active travel: aims, methods and baseline measures of a quasi-experimental study

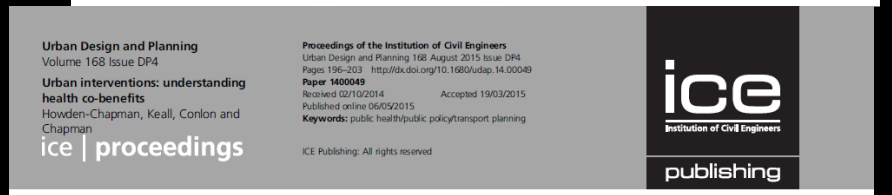
Ralph Chapman[1*], Philippa Howden-Chapman[2], Michael Keall[2], Karen Witten[3], Wokje Abrahamse[1],

JECH Online First, published on June 1, 2015 as 10.1136/jech-2015-205466

Research report

Increasing active travel: results of a quasi-experimental study of an intervention to encourage walking and cycling

Michael Keall,[1] Ralph Chapman,[2] Philippa Howden-Chapman,[1] Karen Witten,[3] Wokje Abrahamse,[4] Alistair Woodward[5]



Urban Design and Planning
Volume 168 Issue DP4

Urban interventions: understanding health co-benefits
Howden-Chapman, Keall, Conlon and Chapman

ice | proceedings

Proceedings of the Institution of Civil Engineers
Urban Design and Planning 168 August 2015 Issue DP4
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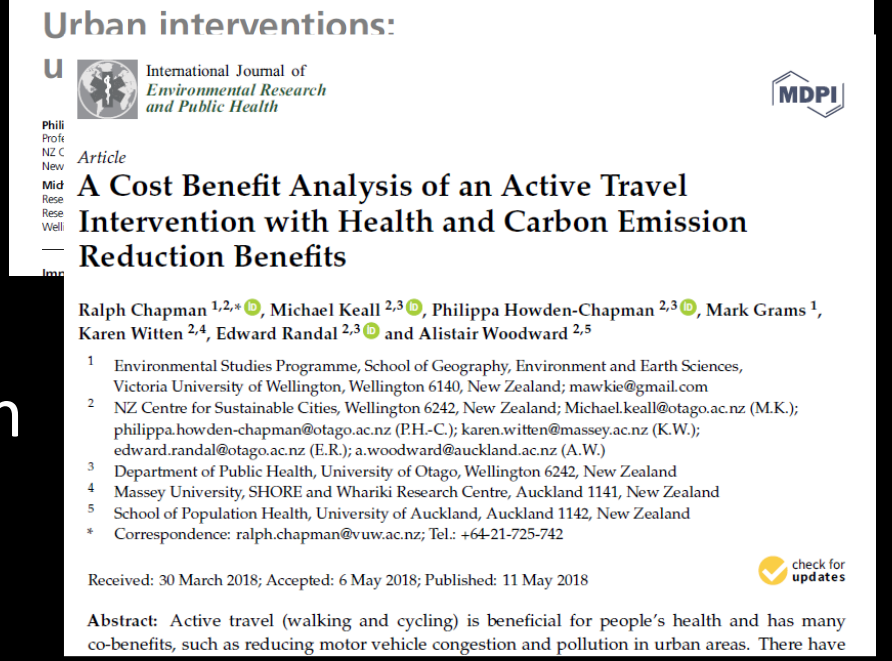

Urban interventions:

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International Journal of Environmental Research and Public Health

MDPI

Article

A Cost Benefit Analysis of an Active Travel Intervention with Health and Carbon Emission Reduction Benefits

Ralph Chapman [1,2,*], Michael Keall [2,3], Philippa Howden-Chapman [2,3], Mark Grams [1], Karen Witten [2,4], Edward Randal [2,3] and Alistair Woodward [2,5]

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check for updates

Abstract: Active travel (walking and cycling) is beneficial for people's health and has many co-benefits, such as reducing motor vehicle congestion and pollution in urban areas. There have

Promoting active travel: high benefit-to-cost ratio

- About 10:1
- Estimate based on careful study comparing 2 study cities + 2 control cities

- Biggest element was health gains

- Also included valuation of CO_2 savings
  - valued at two ‘costs of carbon dioxide’ (sensitivity analysis)
  - value 3.3x higher (1/2 cost of intervention) at latest ests of CO_2 damage/tonne (US$417 per tonne)

Other transport-related research

- **Chapman, R**. (2018) Access and land use: a brief exploration. New Zealand Centre for Sustainable Cities Policy Paper. (A commissioned thinkpiece for the New Zealand Ministry of Transport)

- Whitwell, K. and R. Chapman (submitted 2018), "A move in the right direction: The impact of a workplace relocation on sustainable transport choices & emissions"

- Sobiecki, L. and **R. Chapman** (submitted, 2018) 'Car sharing in a compact city: pinning down the benefits and barriers'.

3 Reflections

Ride On mag

- AT investments can demonstrably increase active trip rates -- by significant amounts
- Benefit / cost ratios can be sizeable and robust
- Health benefits of active travel dominate in a CBA
- Carbon reduction benefits are signif'ly smaller than health savings, but at realistic social cost of carbon, are still notable
- Other co-benefits remain hard to value – e.g. congestion reduction, or amenity. But they too are likely to be much smaller than health savings

Looking forward:
Research evidence and policy

- Critical that co-benefits are included in estimating social returns
    - GPS (2018) has broad co-benefit framework: great that it's added health, access & environmental impacts
- Investments to support cycling, walking, PT & alt. modes will play key part in transforming the city, and cutting emissions
- At the end of the day, a stable climate is critical, so carbon mitigation must be a **top priority** for transport policy.

Thanks

Any questions or comments?