Sustainability issues facing New Zealand cities

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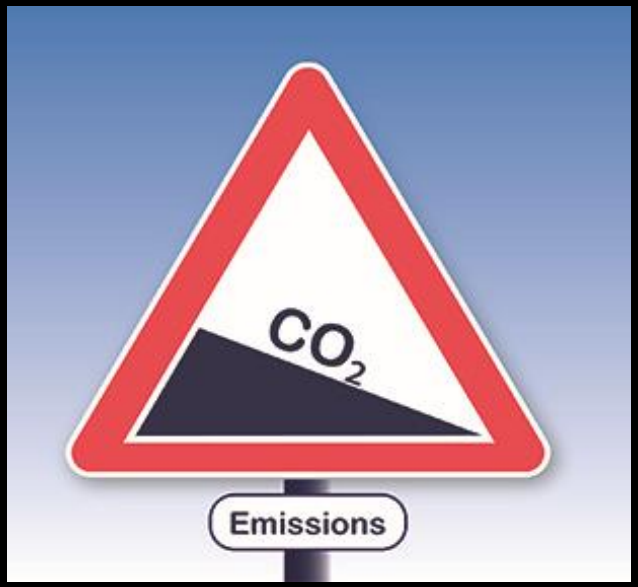
Wellington North Rotary

Plan



Introduction

1. The role of cities
2. Change and transition in cities
3. A positive narrative of transition
4. Conclusion

Introduction

Climate change: not the only sustainability issue but the biggest by far

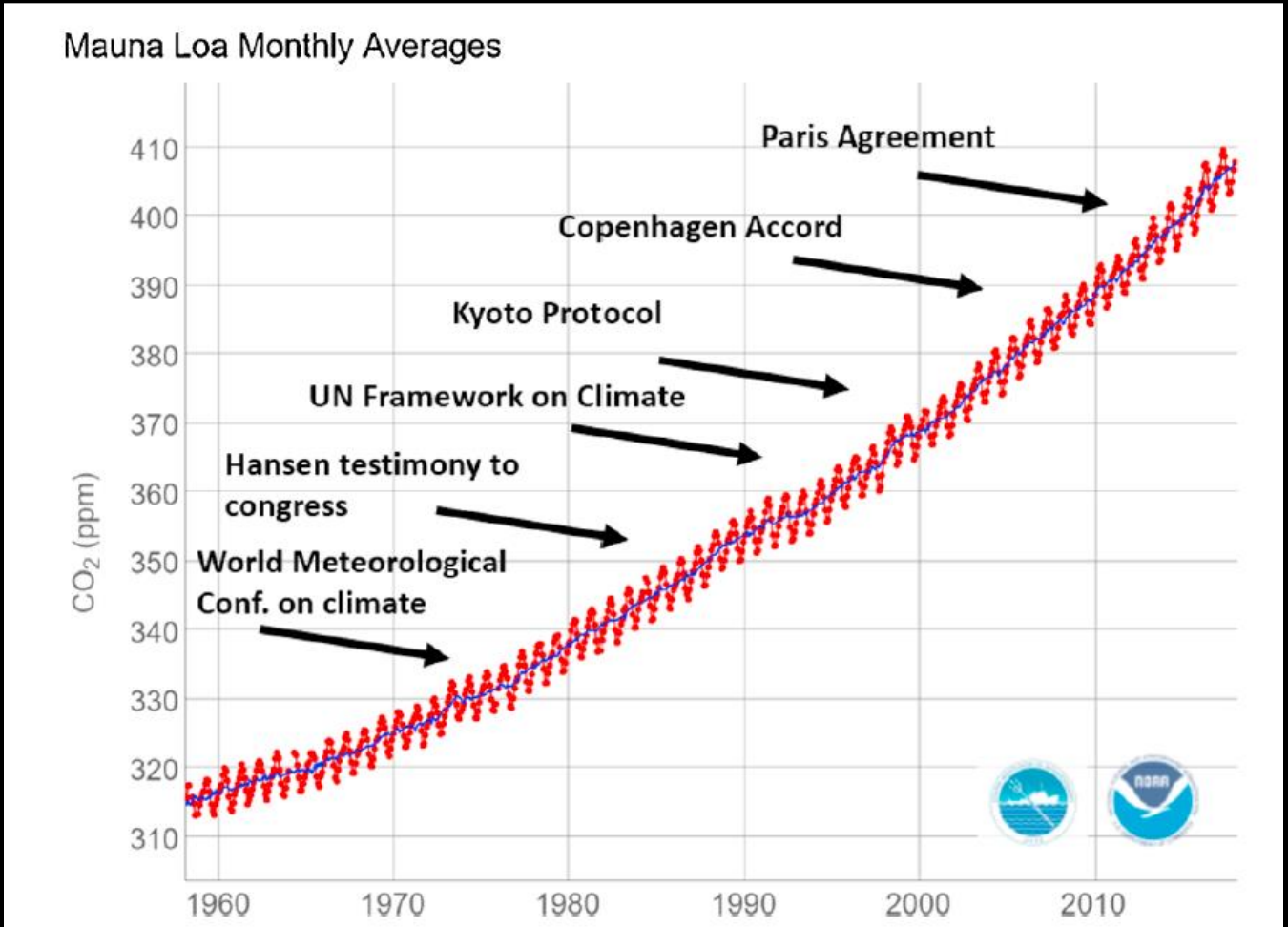
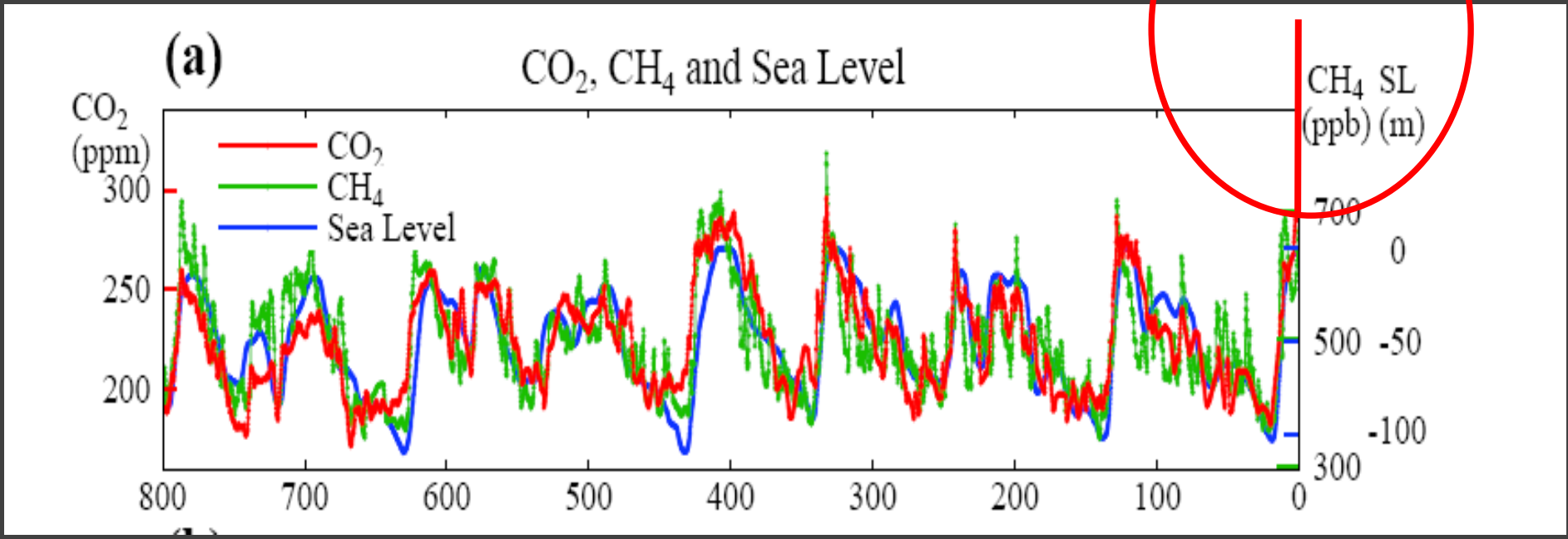


Fig. 9. CO2 concentrations vs human social mileposts.

Hagens 2020

The 800-ky carbon trend …

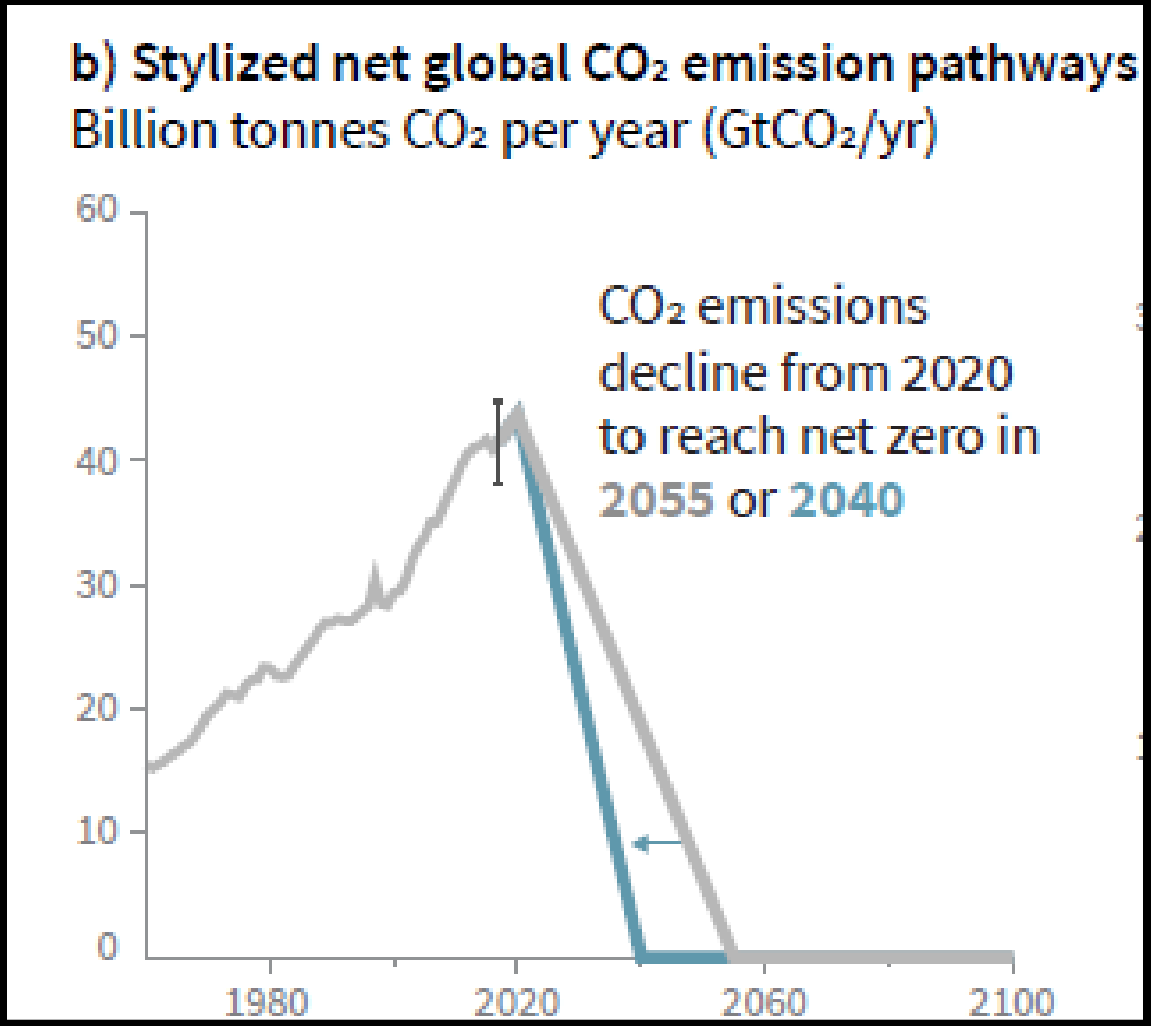
an unprecedented experiment with the atmosphere



Source: Hansen et al (08)

"…human beings are now carrying out a large scale geophysical experiment of a kind that could not have happened in the past nor be reproduced in the future." –Revelle & Suess, 1957

IPCC (2018) report:
The zero-carbon transition is a race against time



We must halve emissions by 2030 for a reasonable chance of limiting warming to around 1.5°C….

Slower cuts → 2°C or more

Mitigation urgency & the policy context

- Prob of >2°C is now high
- Many tipping points between 1.5°C & 2°C (1.5C → ~9m SLR)
- High risk catastrophic impacts above 2°C (eg SLR > 20m?)
- Most govt commitments so far pointed at about 3 °C
- Civilisation significantly threatened if we go well beyond 2°C

- We know:
  a. not aiming well below 2°C is ethically indefensible
  b. to expect more nasty climate 'surprises'
  c. achieving 1.5C would require cutting CO_2 ~6 or 7% each yr
  d. It is a 'climate emergency' but it won't be over soon…

Why ‘not worrying’ turns out to be dangerously cavalier

Xu et al (2020) Future of the human climate niche

- With global heating of 3ºC , extreme heat is projected within 50 yrs to envelop 1.2 billion people in India, 485 million in Nigeria and more than 100 million in each of Pakistan, Indonesia and Sudan.

- In short, likely insufferable heat for well over a billion people within our children’s lifetimes

Sanjay Kanojia/AFP via Getty Images

Approach in this talk

- Focus on urban form and transport – how cities & transport can help in the zero carbon transition
- Critical framing insights
- What the govt is currently doing to make cities more sustainable
- What needs to be done?
  - change needed for an effective urban transition

Waterview connection project wins “Concrete Award” 2019

1 The role of cities

Cities can play a major role

- Cities are major part of carbon emissions problem, but problem is systemic
  - Cities ~ 45% of GHGs; ~76% of total CO_2
  - Transport > 1/3 of urban GHGs

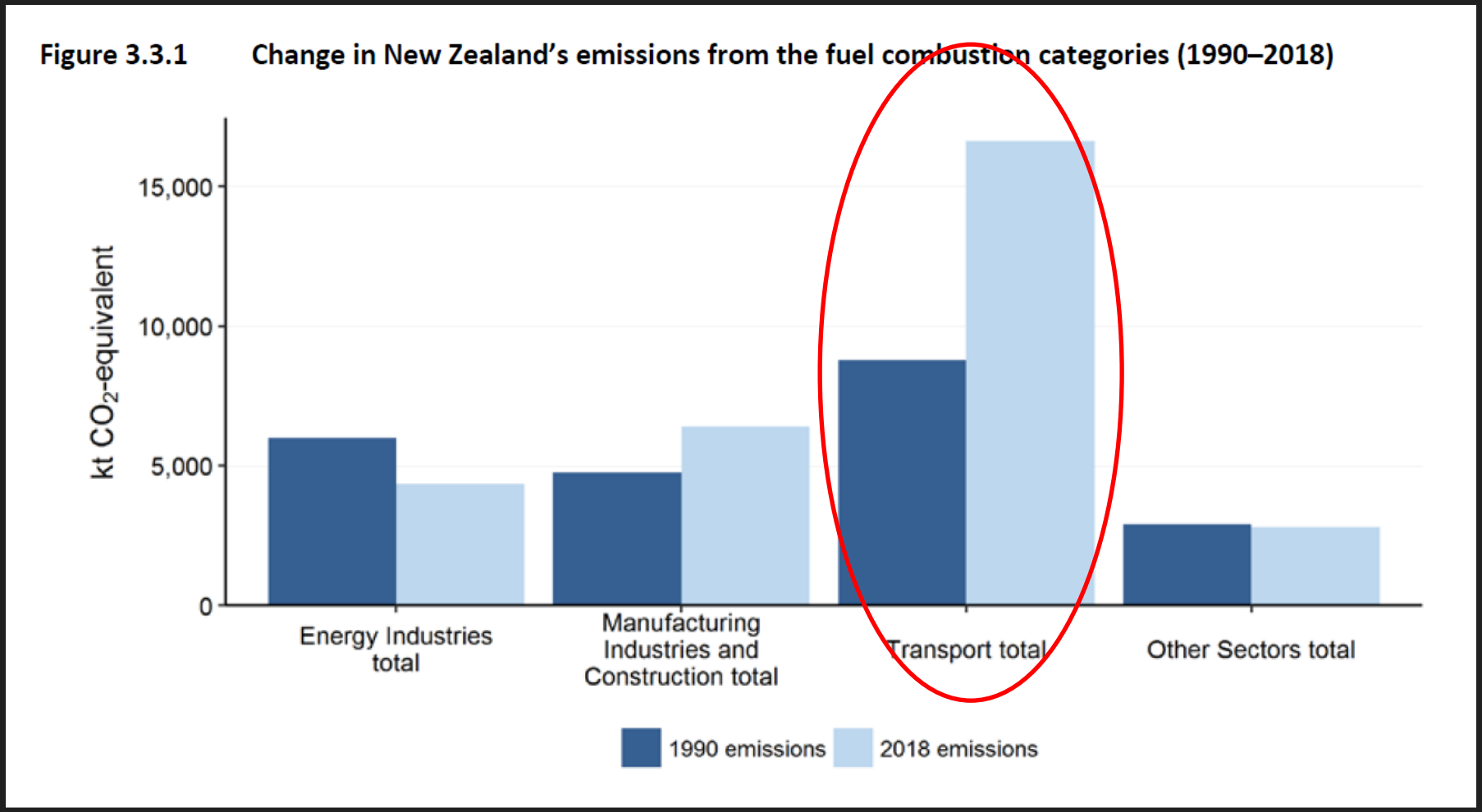
- Type of urban form matters more than city/rural
  - NYC's emissions/person < Oklahoma City's

New York Times

The role of cities (NZ)

- Urban emissions cover housing, transport, etc.
  - Savings in CO_2 from housing since 1990, but…
  - Road transport CO_2 up 102%, 1990-2018
    - fastest growth of any big sector
    - Transport is hardest nut to crack
- Urban CO_2 emissions constitute a huge vulnerability
- Mitigation has to be a central goal of urban policy

Within CO_2 from energy, big growth in road tpt. In 2018, 16.5 Mt/y, up 102% since 1990



Why is contribution of cities critical?

- As well as being big energy users, cities are innovative, and sometimes nimble (Glaeser, 2011)
  - Agglomeration → ideas proliferate and develop rapidly in cities: so can help solve problems
- Downside: cities tend to lock in a pattern of energy-, building- & transport-related emissions
  - Urban land use expanding at 2x rate of urban popn growth; low density → high emissions

What could hold cities back?

- Cities are complex systems
  - City governance is complex and multi-level
  - Need to work across sectoral and political boundaries (NZPC, 2020)
- Conflicting pressures – growth; nature of change (e.g. resistance to intensification) (MfE, 2020: NPS)
- Some previous policies damaging (MfE, 2020)
  - e.g. much land use regulation can impede intensification

How can we facilitate urban transitions?

Leverage points -- 'places… where a small change can lead to a large shift in behavior' (Meadows, 2009)

- Infrastructure renewal opportunities, to improve building carbon efficiency – e.g. NYC building CO_2 down 40% by 2030
- Trendsetters / frontrunners can drive qualitative shift in investment (Loorbach & Rotmans, 2010)
- Greater leverage from policy packages (e.g. complementary measures encouraging walking, cycling together with PT)

2 ‘Change’ & transition in cities: framing

Theme (i): Seeing cities as systems

Mariordro, Wikimedia Commons

- Profound effect on nature of required policy
  - Unintended consequences & systemic interaction
  - Integration / alignment of policies is vital

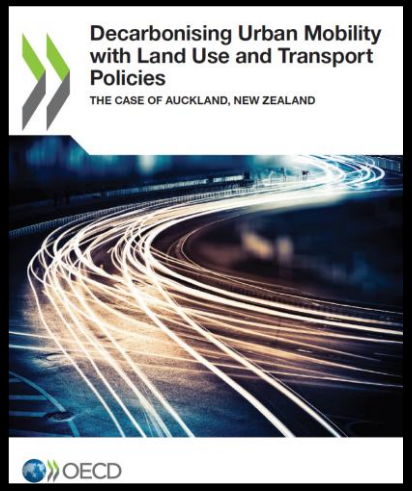
- Co-benefits of mitigation readily available in cities
  - e.g. policies to change urban form contribute to mitigating carbon AND improved health AND quality of life: hence sustainability

Use co-benefits to refashion policy analysis

- Currently, undue focus on growth, incomes and single policy abatement costs (MACs) (MfE, 2020) : silos!

- Vital to identify and emphasise co-benefits – (quality of life, equity, health, holding housing costs) and not to ignore co-costs

- Co-benefits take effort to estimate e.g. effect of sustainable urban form on emissions & health (OECD, 2020)



Example of co-benefits of urban policy

- Investing in active travel
- Programme effect was to increase net active travel by ~30%

- Benefit-to-cost ratio about 10:1 (Chapman et al, 2018)
  Estimate based on careful study comparing 2 study cities + 2 controls

- Alongside the mode change outcome, biggest co-benefit was health gains

- CO_2 savings co-benefit modest but not insignificant

Theme (ii): Aim for coherent & purposeful urban policies

Key aims for robust urban policy:

a. Ensure transition policies are cohesive, ambitious – e.g. co-design transport and urban form

b. Go beyond opportunism to directional experimentation – e.g. plan for fewer cars in urban streets

OECD on urban land use

- ‘Policies that promote a more compact urban form are fundamental in the long-run success of urban transport decarbonisation strategies. ‘
  - OECD, May 2020, Decarbonising urban mobility.., the Case of Auckland…; p.18

NPS-UD now in effect
since August 2020

- Generally helps mitigation, e.g. **Objective 8, and Policy 1:** NZ's urban environments:
  'support reductions in GHGs; and are resilient to the current and future effects of climate change.'

- District plan rules in "city centre zones" in Tier 1 cities will have to "realise as much development capacity as possible" and "maximise the benefits of intensification".

- But climate refs don't use the language of emergency, and objective 2 (affordability) gets more prominence

From ‘muddling through’ to directional experimentation

- Incremental eco-efficiency & random opportunism not enough. Try directional experimentation (Waddock, 2020)

- Strategy: policies / measures that powerfully reinforce changes in related parts of urban system (OECD, 2020)

- Transformation of the whole becomes greater than the sum of the changes in the parts

  - Mutually supporting innovation – e.g. Florence in Renaissance

A new urban transport vision

Current BAU direction (incremental):

- Current urban transport paradigm: more EVs, more motorways, MaaS, more tech, H_2…

A competing (directional) vision:

- Active & public & shared tpt;
  slow, more compact cities & towns;
  traffic-free zones; some electrification;
  v. limited urban use of bioenergy, H_2

3 A positive narrative of transition

Greatest challenge may be ensuring awareness of need for action & developing a positive narrative of transition

Also need inclusive, democratic processes engaging a wide range of actors (from central govt to community)

And government assistance to those disadvantaged by change – a just transition

Examples of a positive narrative

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

FOUR

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

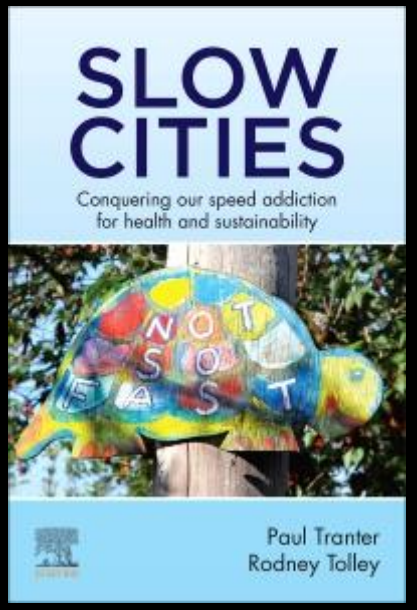
Ralph Chapman, Nadine Dodge, Kate Whitwell, Pattern Reid, Freddie Holmes, Chrissie Severinsen, Nicholas Preval, Ed Randal, Matt Adams & Lucia Sobiecki

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?

Positive evidence as part of the narrative

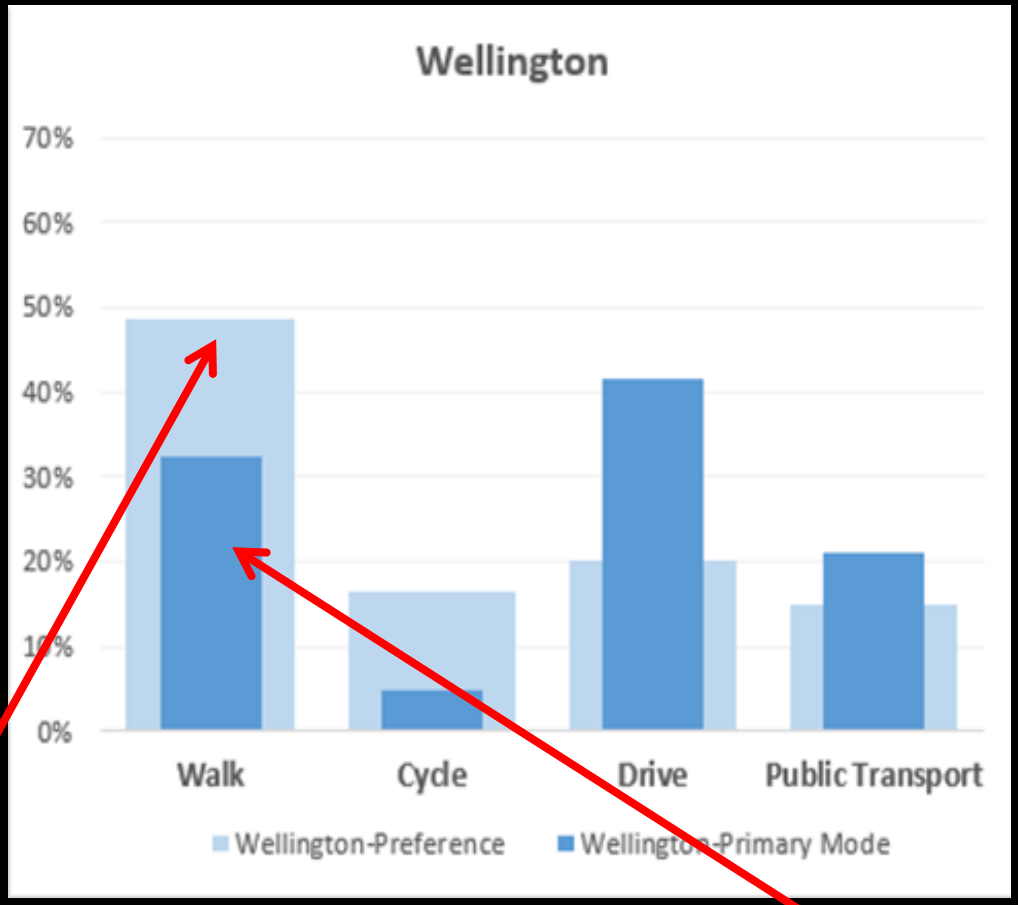
Ride On mag

- Support narratives that resonate widely (Lakoff, 2010; Waddock, 2020)
- Use evidence around changing preferences and benefits of change, including co-benefits
- Evidence of timely, cost-effective change taking place



Elsevier,
17 June 2020

Example of evidence of changing preferences



In both Auckland and Wellington preference to walk or cycle is a lot more than people's current (actual) walking or cycling

Preferred transport modes compared to current primary transport modes (Dodge 2017; Holmes, Chapman and Dodge, 2017)

4 Conclusion

Rintoul St housing, Newtown, Wgtn: WCC

- No time to lose on carbon emissions reduction to avoid collapse of our current form of civilisation

- Unprecedented scale of change
- Halve emissions each decade till 2050. Reduce ~7% /yr

- Cities have major responsibility and major role
- Many aspects of urban systems need rapid transformation

Conclusion (2)

Strong arguments for policy makers to:

- Understand systemic nature of cities
- include co-benefits in assessing policy measures
- focus on well-being not growth
- recognise equity as vital to well-being, & managing change
- provide a positive narrative and positive evidence of change

Keep the long climate change emergency uppermost in formation of urban and transport policy

Thanks

Any questions or comments?

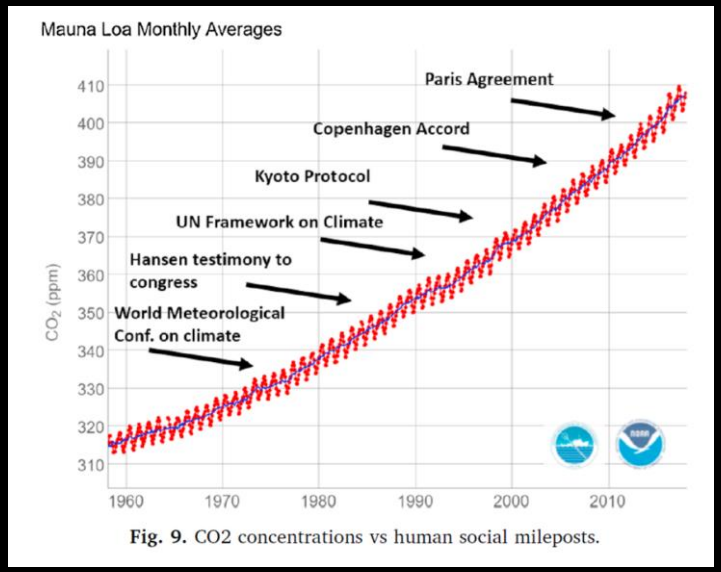


Fig. 9. CO2 concentrations vs human social mileposts.

Selected papers

- Chapman, R. Managing the Transition to a Climate-Neutral Economy in Cities and Regions (2020) *Background Paper for an OECD/EC Workshop 'Managing Environmental and Energy Transitions for Regions and Cities'.* OECD, Paris.
- Chapman, R., and P. Blaschke (2020), "Covid Recovery or Sustainable Transformation?" *Public Health Expert*. April
- Howden-Chapman, P., Keall, M., Whitwell, K. and Chapman, R. (2020) "Evaluating Natural Experiments to Measure the Co-Benefits of Urban Policy Interventions to Reduce Carbon Emissions in New Zealand." *Science of The Total Environment* 700: 134408.
- Chapman, R., M. Keall, P. Howden-Chapman, et al. (2018) "A Cost Benefit Analysis of an Active Travel Intervention with Health and Carbon Emission Reduction Benefits." *Internat J. of Envi Research and Public Health*
- Chapman, R., P. Howden-Chapman, K. Whitwell, and A. Thomas (2017) "Towards Zero Carbon? Constrained Policy Action in Two New Zealand Cities." *Australasian Journal of Environmental Management* 24, no. 2 (2017): 97-116.