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COMMENTARY

NEW ZEALAND GEOGRAPHER WILEY

Transport changes and COVID-19: From present impacts to future possibilities

Lindsey Conrow | Malcolm Campbell | Simon Kingham

School of Earth and Environment, University of Canterbury, Christchurch, New Zealand

Correspondence
Lindsey Conrow, School of Earth and Environment, Beatrice Tinsley Building (Level 2), University of Canterbury, Private Bag 4800, Christchurch 8140, New Zealand.
Email: lindsey.conrow@canterbury.ac.nz

Abstract

Changes in people's movement and travel behaviour have been apparent in many places during the COVID-19 pandemic, with differences seen at a range of spatial scales. These changes, occurring as a result of the COVID-19 'natural experiment', have afforded us an opportunity to reimagine how we might move in our day-to-day travels, offering a hopeful glimpse of possibilities for future policy and planning around transport. The nature and scale of changes in movement and transport resulting from the pandemic have shown we can shift travel behaviour with strong policy responses, which is especially important in the concurrent climate change crisis.

KEYWORDS

climate change, COVID-19, movement, policy, transport, wellbeing

1 | INTRODUCTION: MOVEMENT AND COVID-19

People's movement has been curtailed in many places during the COVID-19 pandemic, whether across national, regional or neighbourhood boundaries, in an effort to curb SARS-CoV-2 virus transmission. In this context of restricted and reduced movement, the places people visit, the modes they use to travel and their travel patterns have at times changed. These changes have broader implications for transport futures and how we might address ongoing issues in movement behaviour.

In this commentary, we report on movement trends and patterns within Aotearoa New Zealand (NZ). We specifically address emerging data relating to peoples' movements during the pandemic at multiple scales, beginning with a global viewpoint before moving to national, regional and then more localised aspects of change. We conclude by offering hopeful links to securing these changes in our transition to a lower emissions future, as informed by changes observed during the pandemic. This is especially salient in addressing the concurrent climate crisis and improving health and equity in our towns, cities and regions.

2 | MOVEMENT: INTERNATIONAL

The pandemic has fundamentally altered international movement into and out of New Zealand. Prior to this, a large part of the New Zealand economy was focused on tourism (Statistics NZ, 2020), accounting for 9%–10% of value-added gross domestic product (GDP) and around 20% of all exports. The tourism industry brought large numbers of people (tourists) into and out of New Zealand, and daily border crossings had been slowly but steadily increasing. Figure 1 illustrates the strikingly abrupt change to border movement in March 2020, with a precipitous decline in travel to and from New Zealand. This drop resulted from regulations that restricted travel into New Zealand from elsewhere around the world, for both non-New Zealand citizens and residents. A trans-Tasman safe travel corridor was opened on Monday 19th April 2021, allowing two-way travel between New Zealand and Australia, and leading to an expected rise in cross-border movement. However this was later suspended on Friday 23rd July 2021 and remains so at the time of writing.

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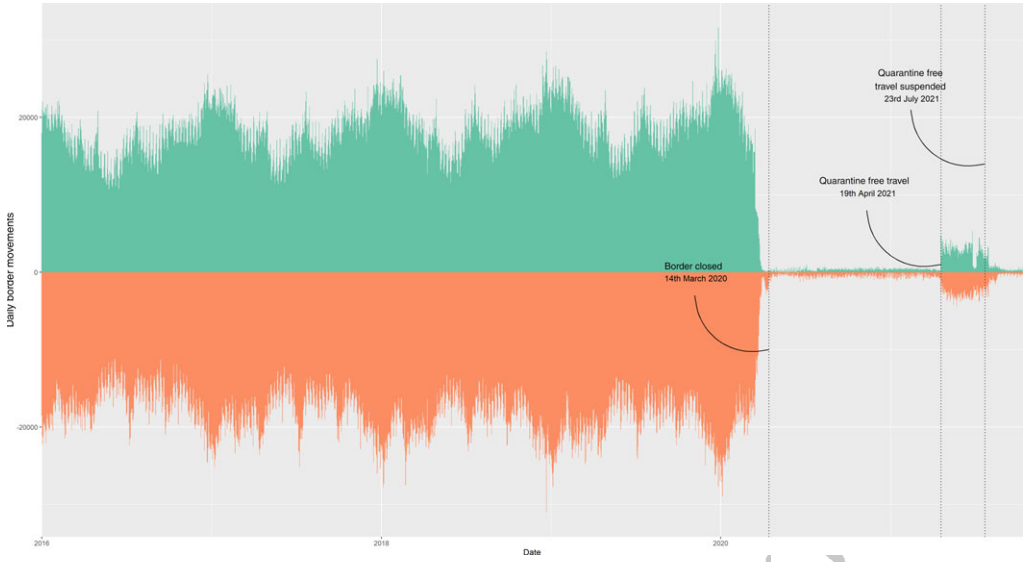

FIGURE 1 International movements at the New Zealand border: arrivals (green) and departures (orange)

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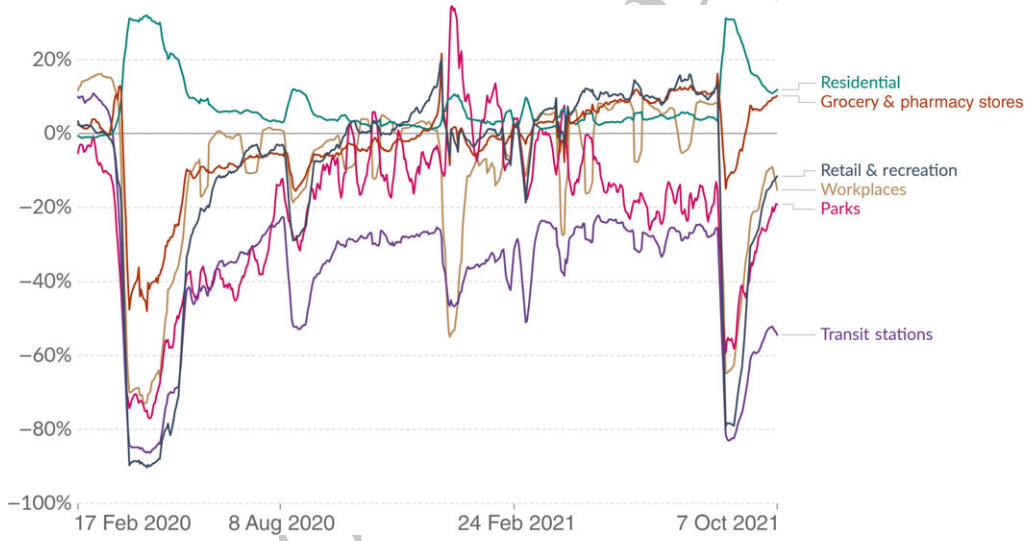

FIGURE 2 Visitors by location type. Note that residential is measured in duration. *Source*: Google Community Mobility Trends, NZ (Ritchie et al., 2020)

3 | MOVEMENT: NATIONAL AND REGIONAL

Changes in people's movement patterns are also reflected by relative changes in visits to key location types since the start of the pandemic. The importance of residential locations during strict 'lockdowns' is highlighted, with increased time spent at home during these periods relating to decreases in workplace and public transit stops since early 2020 (Figure 2). There were also fewer retail/recreation visits during strict lockdown periods. Visits to grocery stores and pharmacies, both of which were deemed essential, showed the smallest reduction.

Modal share, or the percentage of people using different types of transport, has also been impacted by national reductions/restrictions to movement. Overall public transport (PT) use declined more significantly than private vehicle and active travel modes (e.g., walking, cycling) during periods of lockdown, and has taken longer to recover to pre-pandemic levels (as reflected in Figure 2). Though apprehension about using public transport might be expected during a public health crisis, as people may be put in close contact with others from outside their household 'bubble', 'traveling less overall' and 'not needing to travel' were the most frequent reasons given for reduced PT use amongst regular riders

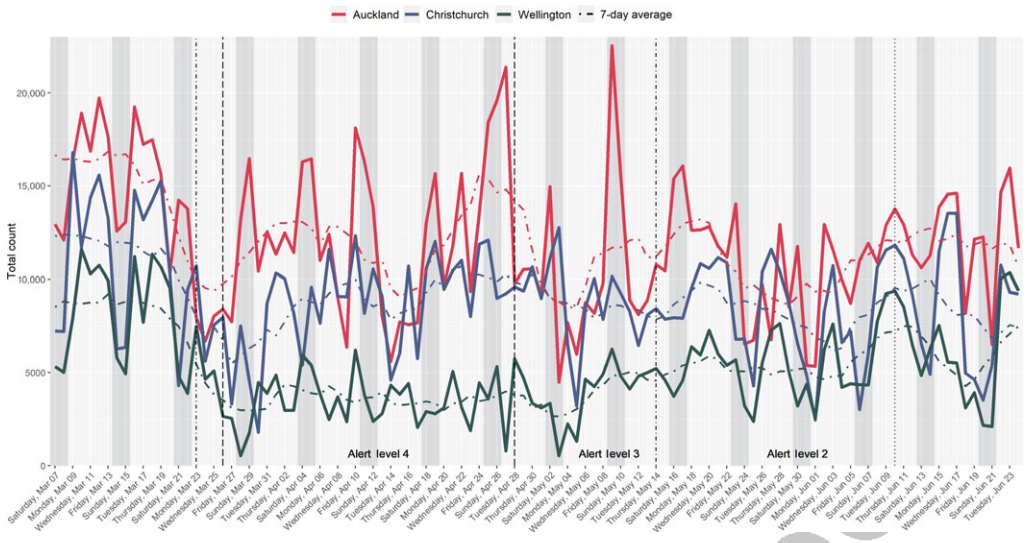

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FIGURE 3 Total cycle count by major city over time, with 7-day rolling average (dashed line)

since the pandemic started (Waka Kotahi, 2021b).[i] The PT decline can therefore largely be attributed to working from home rather than any true modal shift; regular PT users were more likely to continue working from home even as lockdown levels became less restrictive (Waka Kotahi, 2021b). Alert Levels 3 and 4[ii] social distancing requirements necessitated PT fleets to operate at reduced passenger capacities and service frequency was reduced on some routes, possibly meaning PT users chose to continue working from home until normal service levels resumed. This inverse relationship between reduced ridership and increased Alert Level is supported by increases in PT usage as Alert Levels lowered, with significant jumps in PT use tending to occur at level changes where service capacities were less limited (i.e. moving from Alert Level 3 to Level 2).

Despite lockdown restrictions requiring many people to stay at home, the percentage of people using active modes has remained relatively stable and robust to changes in Alert Level restrictions in New Zealand. Walking even showed marked increases during stricter lockdown periods (Waka Kotahi, 2021b). Keeping fit/active and having the opportunity to take a break from home-based activities have been the primary drivers for walking, running or cycling for any purpose since the first Alert Level 4 period (when active mode use peaked). Reductions in traffic volume and noise, and safer environments have contributed to people enjoying streets more, though overall enjoyment has waned over time as people seem to have lost the feeling of community stimulated by the first Level 4 lockdown (Waka Kotahi, 2021b).

4 | MOVEMENT: IN THE NEIGHBOURHOOD

Examining movement at more localised scales, a comparison of cycling counts within major cities (Auckland, Christchurch, Wellington) reveals shifts in cycling activity that are not reflected in national rates (Figure 3). Pre-pandemic cycle counts, as collected by automated counters, generally reflect cycle-commuting patterns, with higher volumes on weekdays compared to weekends. Once lockdowns start, cycling patterns are less tied to commuting activity, with many weekend volumes exceeding those on weekdays; many weekend counts in fact exceeded even pre-pandemic weekend volumes.

While a reduction in weekday cycle commutes is not surprising during Alert Levels that restrict travel to workplaces, changes within cities, and at particular locations, highlight how infrastructure impacts cycling behaviour. In Christchurch, for example, where the modal share of cycle commutes is the highest of the major New Zealand cities, the pre-pandemic cycle commute pattern was displaced by an expected drop near the central city but a less-anticipated increase in cycling at locations on the outskirts. Increased cycling during lockdown periods could indicate that traffic-related factors negatively impact usage along those routes at other times (Hong et al., 2020). The quiet, safer streets with less traffic during lockdown likely made the infrastructure at these locations more functional for daily cycling activity, especially considering that safety – which is usually related to traffic volume or lack of infrastructure – is regularly considered to be a barrier to cycling uptake (Pucher et al., 2010). It is useful to note, however, that measuring cycling activity

using counters alone likely underestimates cycling volumes. In the lockdown context, where people reported enjoying less traffic and safer streets, cycling on streets rather than along cycleways may have increased in ways that were not captured in data that is usually collected on cycling specific infrastructure (Hong et al., 2020).

5 | MOVEMENT: A POST-PANDEMIC GLIMPSE OF MODE SHIFTS

Changes in transport mode share were seen as both an opportunity and a threat early in the pandemic (Laverty et al., 2020). Increased active mode use and reductions in personal vehicle trips have positive health and emissions-reduction impacts (an opportunity). However, reduced public transport patronage, if replaced by vehicle trips, might come with reduced physical activity and an increase in greenhouse gas (GHG) emissions (a threat). A year on from the introduction of Alert Levels, most people in New Zealand feel their travel routines have not changed compared to how they travelled pre-pandemic (Waka Kotahi, 2021a) and the increased active mode use that occurred during lockdown periods appears to have been temporary. The only lasting effect seems to be the reduction in public transport patronage, which poses a series of challenges, particularly those related to transport equity, as any associated service reductions would be disproportionately experienced by people who already face transport disadvantage (Vickerman, 2021; Hasselwander et al., 2021). Inequity has also been noted in the most deprived neighbourhoods in New Zealand, as their lockdown movements were not reduced by the same magnitude as the least deprived neighbourhoods. This is possibly due to the number of people in these neighbourhoods working in essential positions, unable to work from home and/or employed at essential services (e.g., supermarkets) (Campbell et al., 2021).

Governments elsewhere have sought to lock-in some of the positive modal shifts that occurred during COVID-19, and particularly increases in active travel. From this perspective, the pandemic is an opportunity to change our cities in ways that improve transport emissions, health and equity issues (Nurse & Dunning, 2020). In many jurisdictions, this is best shown by successful efforts to increase walking and cycling, in part by promoting them as COVID-19 safe means of transport (Buehler & Pucher, 2021; Jáuregui et al., 2021; Nikitas et al., 2021; O'Malley, 2021). The extent of these efforts is significant, with over a thousand COVID-19-related transport initiatives having been identified internationally (Combs & Pardo, 2021).

The Ministry of Transport has determined that improving our vehicles, primarily through electrification, can deliver only 61% of our necessary emissions reduction. The remaining 41% needs to come from avoiding travel and modal shifts, with a projected need to reduce vehicle kilometres travelled (VKT) by 20% (MoT, 2021; MfE, 2021). Key mechanisms to achieve these reductions include reallocating street space away from single-occupancy vehicles and enabling shifts to active modes and public transport. Modal shifts and changes in road use have been facilitated elsewhere with temporary projects, such as pop-up protected cycleways (Deas et al., 2021; Lovelace et al., 2020). In New Zealand, this transition has been attempted most visibly with the Waka Kotahi Innovating Streets for People initiative.[iii] Moving these projects from temporary to more permanent installations will have significant impacts on the design of our cities, towns and regions.

The pandemic has demonstrated that communities (largely) enjoyed the glimpse of a lower emissions future, but this future has yet to be realised. The huge reductions in international air travel, travel for work and essentials, and transport emissions give a sense of the scale of changes needed to realise New Zealand's climate goals. We need to prioritise and expedite interventions to promote a more rapid response to the climate crisis. Despite neighbourhood support and benefits beyond GHG reduction – such as improved wellbeing, safety and social connection (Kingham et al., 2020) – these interventions may be met with wider resistance. Forward-thinking planning and policy is thus needed to ensure they are implemented effectively (Field et al., 2018).

6 | CONCLUSIONS AND POLICY IMPLICATIONS

The nature and scale of changes in movement and transport resulting from COVID-19 has demonstrated we can shift travel behaviour and reimagine use of street space through strong policy responses. We should use the lessons learned from changes in transport behaviour during the pandemic to enact imaginative policy that recognises that climate change needs a policy response as bold and interventionist as that implemented during COVID-19.

The New Zealand government's focus on reducing VKT and reallocating road space to reduce GHG emissions means we are likely to see further changes to our urban environments. This applies especially to those environments that support sustained improvement in our travel behaviours, such as increased active mode and public transport use. These changes will not only reduce emissions, but will also enhance wellbeing, develop

community and increase the liveability of the places and spaces we inhabit.

The 'natural experiment' induced by the pandemic and early lockdown showed us that modal and behavioural shifts are possible, helping people to enjoy their streets and experience a sense of community. We need to capture these beneficial outcomes with community-led projects that facilitate similar shifts and ensure we develop neighbourhoods as liveable spaces for the future. Understanding place and space lies at the heart of ensuring an effective transition from the present impacts to the future possibilities, and this underlines the importance of Geographers in helping deliver some of these outcomes.

ORCID

Lindsey Conrow https://orcid.org/0000-0003-3693-0763
Malcolm Campbell https://orcid.org/0000-0001-7975-4662

ENDNOTES

[i] Waka Kotahi | NZ Transport Agency has been collecting data on COVID-19 impacts to transport choice in continuous waves since April 2020. See https://www.nzta.govt.nz/resources/covid-19-impacts-on-transport/.

[ii] Alert Levels indicate the measures being taken to reduce virus transmission during the COVID-19 pandemic. Higher alert levels are associated with more restrictions. See https://covid19.govt.nz/alert-levels-and-updates/about-the-alert-system/.

[iii] https://www.nzta.govt.nz/roads-and-rail/innovating-streets/.

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