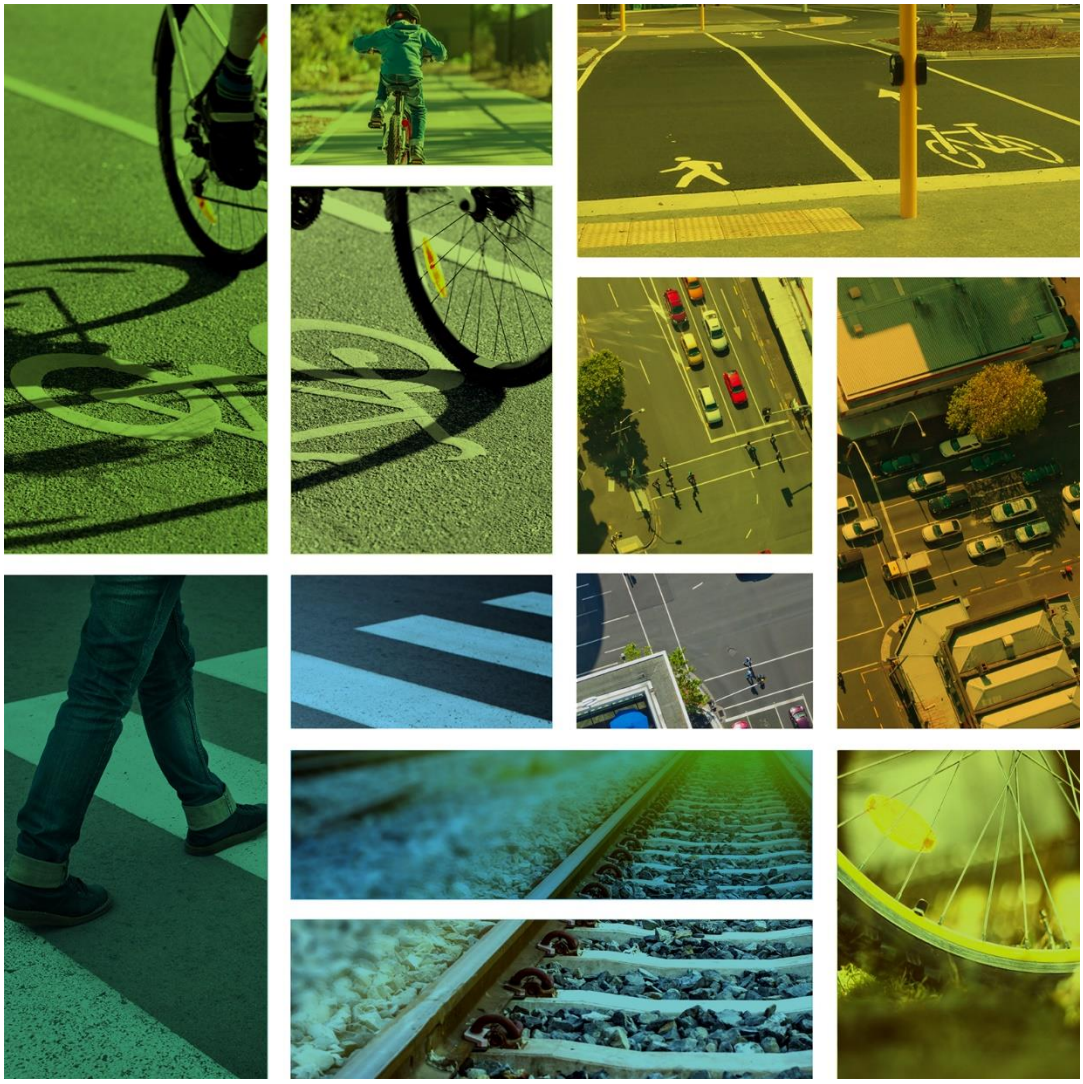


STREET SPACE REALLOCATION TO FIGHT COVID-19

Opportunities and challenges for New Zealand

Kirsty Wild | Greer Hawley | Alistair Woodward | Rebekah Thorne | Hamish Mackie

16 NOVEMBER 2020

MACKIE RESEARCH
OPTIMISING HUMAN SYSTEMS

THE UNIVERSITY OF AUCKLAND
Te Whare Wānanga o Tāmaki Makaurau
NEW ZEALAND

Document Title:	Street space reallocation to fight COVID-19: Opportunities and challenges for New Zealand
Prepared for:	Waka Kotahi NZ Transport Agency
Prepared by:	Mackie Research and the University of Auckland

Signed 

Date

16/11/2020

Revision history

Revision No.	Amendments	Completed by	Date
1	Draft Report	Project authors	6/11/2020
2	Final Report	Project authors	16/11/2020

Citation

Wild, K., Hawley, G., Woodward, A., Thorne, R., Mackie H. (2020). *Street space reallocation to fight COVID-19: Opportunities and challenges for New Zealand.* A report prepared for Waka Kotahi NZ Transport Agency by Mackie Research and the University of Auckland.

Mackie Research is an organisation providing high quality independent human systems research and consultancy services. Mackie Research has expertise across a range of areas including transport human factors (road safety and sustainable transport), recreation, equipment design, evaluation and other areas where interactions between people and their environment or the things that people use are important.

Authorship: This document was written with contributions from all five named authors. For further information, please contact Hamish Mackie using the contact details below.

Disclaimer: Mackie Research, its contributors and employees shall not be liable for any loss or damage sustained by any person relying on this report, whatever the cause of such loss or damage.

Mackie Research:

Physical address
Level 2 Princes court
2 Princes Street
Auckland 1010

Postal address
PO Box 106525
Auckland City
Auckland 1143

Ph 09 394 7041
MB 021 067 0337
www.mackieresearch.co.nz

Acknowledgements

We would like to thank all the transport sector staff who participated in this research and made the time to talk to us about their experience of transport planning in a pandemic. This research is designed to provide an opportunity for the transport sector to reflect on the possibilities and challenges of one type of pandemic transport response: street space reallocation. We acknowledge that our COVID-19 emergency response has required many people in our transport sector to put in long hours, often for weeks or even months at a time, and we thank everyone for their efforts to keep us and our families safe during this extraordinary time.

EXECUTIVE SUMMARY

With the prospects of a vaccine or treatment for COVID-19 currently uncertain, further outbreaks are a possibility, and with a substantial recovery effort underway New Zealand's transport system must be well prepared to a) support the success of infection control measures during further outbreaks, and b) support the resilience and recovery of communities in the pandemic and post-pandemic periods. This long-term approach can be described as a 'marathon' rather than a 'sprint'.

In New Zealand, temporary street space reallocation projects were implemented in the first phase of the COVID-19 epidemic (March/April/May 2020), primarily through the Innovating Streets for People Fund. However, compared to the temporary walking and cycling networks that have been rolled out overseas, for a range of reasons New Zealand's measures were generally short-lived, and of variable quality. We need to learn from this experience and better understand how New Zealand's street space can play a role both in combating COVID-19 and other pandemics, and supporting community resilience and recovery.

Research Aims and Method

The aims of this work were to:

1) Examine the effectiveness of the transport sector's contribution to COVID-19 public health infection control measures, to date, specifically focussing on temporary street space reallocation.
2) Examine the effectiveness of the transport sector's contribution to supporting community resilience and recovery during the COVID-19 pandemic, including enabling communities to maintain physical activity, access to essential goods and services, employment, and social connection.
3) Identify what could be improved so that New Zealand is better prepared for similar future events, including further COVID-19 outbreaks, and investigate a level system for street space allocation based on the concept of a National Physical Distancing Strategy.
4) Explore what lessons could be learnt from the COVID-19 response for advancing future transport goals.

The methods included:

- Reference to the literature on transport and pandemic responses.
- Interviews with New Zealand stakeholders, including ten local government staff (Auckland, Wellington, Dunedin, and Morrinsville) and two central government representatives.
- Interviews with senior staff in transport agencies in four cities overseas (London, Sydney, Melbourne, and Bogotá) in which rapid and extensive changes were made to city streets as part of the pandemic response.
- An online workshop with New Zealand transport professionals to discuss a proposed COVID-19 transport response framework focussing on street space allocation.

Key Findings

There were common features to the street changes, locally and internationally. Wider footpaths, pop-up bike lanes, speed reductions, and wider and easier pedestrian crossings featured in all the responses to COVID-19. There were differences also. Free parking was introduced in some New Zealand cities to accommodate those who did not want to use public transport but still needed to travel. By contrast, in London and Bogotá, authorities took steps to actively discourage car use, including congestion charging and street closures. The use of footpaths and street space to accommodate business activity was at the centre of COVID responses in some places (e.g. London, Melbourne), but was not so prominent in New Zealand, aside from in Dunedin.

Collaboration and buy-in within organisations, the ability to move quickly once an emergency was declared, and making using of emergency processes (e.g. the emergency speed limit rule), with few precedents to draw on, were all identified as successful elements of the New Zealand response. It was also acknowledged that the Innovating Streets for People Fund provided a strong incentive to act in local areas.

A range of barriers and challenges were reported in New Zealand cities – time pressure, the relatively fast move to level 1, limited perceived need to intervene, concerns around lack of engagement and public backlash and the quality of the interventions – all of which appeared to affect the response from conception/planning through to implementation. It was apparent that even though local government leaders were keen to take action to support the public health effort, there was limited confidence in the mandate to act without expressed support from local constituencies, such as local boards, elected members, and business associations, especially for more comprehensive street space reallocation projects.

While the responses in overseas cities were not 'challenge-free', and the issues encountered were often similar to those in New Zealand, there were important differences. In the international case studies the public health crisis was the reason for action, and street changes were treated as an element of the emergency response. Strong city leadership and explicit support from the heads of transport departments provided the mandate; emergency regulations empowered agencies to act. Close engagement with all affected (including commercial operators, user groups such as cycling and walking associations, community and business interests and local politicians) was important to enable learning from the street changes, to deal with problems that arose, and make improvements where possible.

With some exceptions, New Zealand interventions were primarily focused on responding to perceived demand rather than shaping or enabling mobility and supporting social inclusion in line with Alert Level requirements. Consistent with this approach, the interventions described as successful were those that received a high level of use by pedestrians and cyclists, with Tāmaki Drive and Wellington's south coast speed reduction as the best examples. The global importance of public health action was widely acknowledged, but at the level of particular interventions, responding where there was no demand (or more precisely, no expressed demand as captured by numbers of walkers and bikers on the street) was framed as an unsuccessful response. People isolating themselves and not making essential trips due to fear of contagion was seldom acknowledged as a problem or a rationale for street space reallocation.

At the temporary intervention sites where low usage by pedestrians and cyclists was observed, there may be other reasons than lack of demand or lack of need – such as poor design and lack of maintenance. For example, in Auckland the use of the Traffic Management Process (TMP) meant orange cones were used to mark street changes, and this contributed to high costs, maintenance issues, public backlash, usability problems and a roadworks 'look and feel'. Within most local interventions there were elements of 'success' and 'non-success', and therefore the

ability (and time) to adapt and refine is important – a notion that is supported by the experiences in overseas cities. Moreover, while existing regulatory and legal frameworks allowed local authorities to at least implement 'something' this time around, it is not clear whether these processes, in their present form, are indeed fit for purpose. Gaps may include provisions for high-quality materials and maintenance, as well as long-term implementation.

New Zealand's success in controlling COVID-19 may have made it more difficult to introduce street changes, since the need for action was less apparent than in other countries. Some New Zealand informants pointed to the very small number of COVID-19 cases and infrequent community transmission as good reasons to not proceed with street space changes, or to remove what had been installed. However, the number of cases is not a sensitive measure of success when the incidence of COVID-19 is very low, as it has been in New Zealand outside of managed quarantine and isolation facilities. And most importantly, the point of pandemic prevention is to act before infection is widespread.

A strong message from the interviews and the literature is that it is much easier to move quickly and effectively in the time of a pandemic if there is a plan to hand. Examples overseas include Ciclovia in Bogotá (which was converted rapidly from a one day a week event to seven days a week, opening up about 150 km of city streets to safe active travel), the United Kingdom's cycling strategy, Sydney's pre-COVID-19 approved business case for cycling, and Oakland's 2019 Bike Plan, all of which were able to be quickly drawn on to provide a platform for COVID-19 responses.

It was apparent that a clear steer on the practicalities of street changes is helpful, covering areas such as footpath width, separators on pop-up bike lanes, outdoor space for businesses, and street closures. Further, some local government staff said they would appreciate more central government guidance and 'back-up'. We view the proposed *COVID-19 Transport Response - Street Space Framework*, developed as part of this work in response to feedback from transport staff, as a means to support leadership and guidance nationally.

Our findings also indicate it may be helpful to link transport changes with the larger goal of economic recovery. For instance, the argument was made in London that more space for walking and cycling was needed to reduce the load on public transport, and that had to happen in order for essential workers who depended on buses and trains to travel safely.

Conclusion and Recommendations

While New Zealand is currently experiencing low numbers of daily cases, there is a risk of further COVID-19 community outbreaks and sustained, extensive effort will be required to continue to achieve the goal of elimination. Street space reallocation projects can play a critical role in helping to prevent outbreaks, helping to manage outbreaks, and supporting our communities to stay resilient and recover. In addition, over and above COVID-19 there are strong arguments for street space reallocation projects that support walking, cycling, and the use of public space – climate change, safety, and better transport options are all strategic priorities in the GPS 2021.

Considerable learning has occurred through the transport response to COVID-19 to date, both from experiences here in New Zealand and drawing on those from overseas. Optimistically, the response has also stimulated thinking about how we use our street space, and in some instances may have created a platform for discussion and change. What is needed next is a pathway to embed this learning into strategies, plans, and practice.

We recommend seven action areas to: help prevent the further spread of COVID-19; promote community resilience and recovery; better prepare the country to respond to future pandemics and disruptions; and advance our transport policy goals.

1. Build on what has worked well. There were examples of positive street use responses to COVID-19 in a number of regions. We can learn from the adaptability, improvisation, and leadership that underpinned these responses to complement a suitable national response.

2. Tell the "why?" story better. In a similar way to the COVID-19 app and mask use, many people don't understand why physical distancing is needed when COVID-19 isn't in their local community.

   Elements include:

   a) a strong narrative consistent with government messaging on COVID-19 (e.g. 'creating more space to keep everyone safe and healthy', and 'we are level 1 not level none')
   b) priority goes to protecting those who are most vulnerable
   c) streets are important assets for physical distancing and community resilience
   d) the purpose of pandemic prevention is to act before infection is widespread
   e) guidance for local government on how public engagement should proceed when street changes are made.

3. Develop a nationally agreed way of working on safe streets as part of the pandemic response. Focus on national direction and enabling local government responsiveness, employing:

   a) a high-level nationally agreed framework on what changes are required and when (see Section 8.1), with accompanying text including suggestions for prioritisation
   b) local government plans that respond to the national framework and make use of existing mechanisms, such as Network Operating Plans
   c) support for local government to roll out plans utilising a nationally-led emergency response fund, design guidance, insurance etc.

4. Review the regulations to enable rapid street change and make changes where necessary. An effective pandemic response requires fit for purpose regulatory mechanisms to empower local government to implement high-quality street space modifications, and to keep them long-term if the changes fit strategic transport priorities.

5. Improve the cross-Ministry response on street space. Central government has worked hard to coordinate COVID-19 response efforts. Now include coordinated understanding of the need for street space modification as part of the COVID-19 response:

   a) engage with the Ministry of Health on street changes for physical distancing and resilience
   b) ensure the messaging on active transport and street space reallocation during a pandemic is consistent through the lines of command.

6. Develop suitable measures of success for a street space pandemic response that form the basis of evaluation, monitoring and continuous improvement, including:

   a) process measures to further understand and overcome barriers to effective rollout
   b) outcome measures that fit the objectives of the pandemic response, such as the usability of street modifications, evidence of physical distancing, uptake of walking and cycling, amount of physical activity.

7. Formally include cycling and walking advocacy groups in the emergency response. This has worked well overseas as part of the pandemic response, and in New Zealand advocacy groups have supported local government on other walking and cycling projects.

CONTENTS

1. INTRODUCTION

The transport sector plays a critical role in protecting the health and resilience of populations during a pandemic. Viruses, and associated public health measures such as 'lockdowns', disrupt people's ability to move freely and safely in their communities. Efficient and safe transport systems enable communities to *avoid infection*, as well as *maintain physical and mental health* and meet their *basic needs* during a pandemic.

This report focuses on the importance of street reallocation as a tool to support New Zealand's COVID-19 response. New Zealand was one of the first countries to introduce temporary street reallocation measures to support our communities during the early stages of the COVID-19 pandemic. However, these measures were generally short-lived, and often of modest quality, providing limited additional safe physical distancing capacity for communities. We examine what these early experiments with street reallocation were like for our transport sector, and what we have learned so far.

1.1. Study rationale

In many respects the COVID-19 pandemic has worsened existing difficulties that many communities, and particularly vulnerable communities, have using public spaces safely. Many cities do not provide enough space for safe and efficient walking, cycling and public transport use. The new need to provide for physical distancing has exacerbated this safety crisis. In response, it is estimated that more than 150 cities worldwide have initiated 'street reallocation' programmes designed to open up additional public space for pedestrians, cyclists and public transport users during the pandemic (International Transport Forum, 2020).

The prospects of a vaccine or treatment for COVID-19 are currently uncertain, and further community outbreaks are highly likely. Stephen Kissler (2020) and colleagues from Harvard suggest the disease may be a threat as late as 2025. This is a 'marathon' of infection control. There is a need to plan and set up systems for the long-term. Along the way there will be 'COVID sprints' - urgent but temporary responses to spiking numbers of people affected by the disease. Environmental interventions, like street reallocation, which aim to reduce the infectiousness of everyday community settings, have been identified as critical to enabling communities to sustain the COVID marathon (Michie and West, 2020). A recent review by Douglas et al (2020) in the British Medical Journal identified four key ways that the transport sector can move to support and safeguard the health and resilience of communities during the COVID-19 pandemic:

- Discourage unnecessary car journeys
- Support active travel modes
- Support safe access to green spaces
- Post-pandemic support for public transport

Street reallocation is a critical tool that the New Zealand transport sector can use to support these priorities during the next 3-5 years while COVID-19 is likely to remain a challenge in our communities. This research aims to draw out key lessons from New Zealand's early experiences with street reallocation as a response to COVID-19. Being called upon to rapidly reallocate streets to support public safety in a pandemic was a new and unfamiliar challenge. What have we learned so far? What has worked well and what has been difficult? Do we have all the tools

and resources that we need? How can we prepare for future outbreaks? Is street reallocation a priority? How can we make it a priority?

1.2. Study objectives

This research has four objectives:

1) Examine the effectiveness of the transport sector's contribution to COVID-19 public health infection control measures, to date, specifically focussing on temporary road space reallocation.
2) Examine the effectiveness of the transport sector's contribution to supporting community resilience and recovery during the COVID-19 pandemic, including enabling communities to maintain physical activity, access to essential goods and services, employment, and social connection.
3) Identify what could be improved so that New Zealand is better prepared for similar future events, including further COVID-19 outbreaks, and investigate a level system for street space allocation based on the concept of a National Physical Distancing Strategy.
4) Explore what lessons could be learnt from the COVID-19 response for advancing future transport goals.

1.3. How can the transport sector contribute to New Zealand's COVID-19 elimination strategy?

1.3.1. Introduction: The goal of elimination

New Zealand is currently pursuing a COVID-19 elimination strategy, with a four-tiered Alert Level response system (Appendix A). 'Elimination' in this context means preventing and stopping local transmission. It does not mean that we will have no cases of COVID-19; however, it means that if cases occur in the community we will move quickly to 'stamp out' transmission of the virus. New Zealand has had some important early success with our elimination strategy (Jefferies et al. 2020). However, a sustained and extensive effort will be required to maintain this success. COVID-19 is a tricky virus, and despite considerable efforts to upscale contact-tracing, border control, and quarantine measures, we are still seeing occasional cases of community transmission. As Auckland's second lockdown in August 2020 highlighted, these community cases can multiply rapidly and put parts or all of New Zealand back into lockdown. Lockdowns are very effective, but they have considerable social and economic costs, and therefore *prevention* is likely to play an increasingly important role in New Zealand's elimination strategy.

The initial success of our elimination strategy does not mean the hazard has gone away, or that we can all go back to the way things were before. At present (mid-November), the virus is still active, and there is still a possibility, perhaps a high possibility, of future outbreaks. In this situation ***prevention does not become less important as case numbers decline***. Indeed, the period between outbreaks is the very best time to focus on what needs to be done to block community transmission when the infection returns.

This is an important point, that the need for prevention cannot be judged by the number of cases of disease or injury that are immediately evident. It would make no sense, for instance, to

stop earthquake-proofing New Zealand buildings because no-one has died recently when their home collapsed. We act because we know it is highly likely that the problem will occur again in the future. This is also the rationale for 'COVID-proofing', for making environmental changes that will enhance physical distancing and promote community wellbeing in pandemic times.

1.3.2. The transport sector's contribution to elimination

The transport sector can contribute to New Zealand's COVID-19 elimination strategy in three important and interconnected ways:

1) Helping to ***prevent*** outbreaks,
2) Helping to ***manage outbreaks***, and
3) Supporting community resilience and 'buy-in' to elimination efforts

Preventing outbreaks of COVID-19

The transport sector is currently making an important contribution to aspects of our COVID-19 prevention efforts, including our border control and contact tracing programmes. Another key contribution that the sector can make to COVID-19 prevention is through *identifying and modifying the transport environments* that are the highest risk for spreading the virus in the community. By moving to proactively 'COVID-proof' transport environments as much as possible, the transport sector can help to reduce the speed and extent of community outbreaks if and when cases come through the border. Often community transmission has already occurred for days or sometimes weeks before we have become aware of it, and creating 'safer' transport environments that enable people to practice physical distancing will help to prevent and limit the size of these outbreaks.

Prevention of a disease like COVID-19 means interrupting the spread of infection. Without a vaccine, this must be achieved by physically blocking movement of the virus from one person to another. Hand-washing, mask-wearing, and guarded coughing and sneezing are all important. But physical distancing is the fundamental strategy. It can be scaled up readily to protect very large numbers of people (through national lockdowns for instance, or border closures), and does not necessarily rely on individuals making decisions all the time (for example, how to sneeze, when to wear a mask). The evidence suggests that environmental changes (such as wide footpaths and safe bike lanes) that make physical distancing an easy and natural option will be much more effective than education campaigns. This is known from experience with a host of public health interventions (road safety for example, or fluoridation of drinking water: Baker and Haddon, 1974; Farmer and Lund, 2006; Rugg-Gun and Do, 2012).

In addition to reducing the infectiousness of transport environments, the transport sector can also make an important contribution to supporting our communities to maintain their physical health, reducing the *severity of infection* in the community. Poor physical health, and particularly becoming overweight or developing diabetes, significantly increases the severity of COVID-19 infection (Ma and Holt, 2020; Jackson-Morris et al. 2020). The transport sector plays a critical role in enabling people to get out into the community to meet basic needs for *employment*, *food*, *health care*, *social connection* and *physical activity*. These are the basis of good physical health. Lockdowns, fear of the virus, and avoidance of indoor, crowded transport and recreational environments all reduce opportunities for exercise (Jackson-Morris et al. 2020; Lippi et al., 2020), increase time spent indoors, and elevate levels of loneliness (Loneliness NZ, 2020; Walker, 2020). By making our transport environments as safe as possible, we can help people to keep getting out and stay active, and reduce the severity of the COVID-19 disease burden.

Health researchers have highlighted the critical importance of supporting people, and particularly people in low-income communities to continue to access healthy food and undertake sufficient exercise, because an increase in obesity and non-communicable disease will increase the severity of COVID-19 outbreaks in our communities:

> *"Lockdowns and social isolation may exacerbate 'root' factors that contribute to obesity, particularly an obesogenic environment in which healthier food and activity patterns are more difficult to achieve, and the impact that adverse life events and poor mental wellbeing can have upon weight ... The pandemic affects what people are eating and drinking, and reduces physical activity – effects that are likely to be magnified among people on lower incomes, due to more limited food choices as supply chains are disrupted, food price hikes occur, and people have less access to indoor or outdoor space." (Jackson-Morris, 2020: 2)*

Some data suggests that reductions in physical activity may be occurring in New Zealand, especially amongst young people, as a result of the pandemic. Estimates from Sport NZ indicate that physical activity levels increased during Level 4 for adults; however, for children and young people the absence of physical education, organised sport, and time with friends disrupted normal activity patterns. Comparisons between June 2019 to June 2020 show a drop of 53 mins per week for adults and 90 minutes per week for children and young people (Voxy, 2020). Internationally, there are concerns that short-term changes to physical activity as a result of COVID-19 in children may fail to recover, increasing risks of obesity, cardiovascular disease, and diabetes (Dunton et al. 2020, Kyriazis et al. 2020). There is also evidence of a spike in Rheumatic fever cases in New Zealand children, thought to be exacerbated by reduced access to throat-swabbing and overcrowded homes (Quinn, 2020).

Opening up more street space to create additional room for kids to play, and for families and commuters to walk and cycle, especially in communities with higher levels of overcrowded housing, is a vital contribution that the transport sector can make to 'COVID-proofing' our communities.

Managing outbreaks

Our transport sector has contributed to the management of COVID-19 outbreaks, particularly at Levels 3 and 4, including through supporting our border control and contact tracing efforts; helping to keep freight moving; supporting transport operators to function safely; and contributing to public health messaging. These activities are part of New Zealand's pandemic response plan, with the Ministry of Transport responsible for overseeing these efforts.

Public space and street space interventions can also make an important contribution to the management of COVID-19 outbreaks through helping to reduce the extent of community transmission and the burden of COVID-19 impacts on vulnerable communities. The transport sector can use street reallocation to manage future COVID-19 outbreaks by:

1) Providing additional cycling and footpath space in order to a) Ensure that *public spaces remain safe to use*, and b) Ensure the availability of *safe alternative commute options* during a time of reduced public transport capacity to ensure that those who are *reliant on these services do not lose their mobility*.

2) Supporting stay local orders by increasing the safety and usability of neighbourhood environments, i.e. speed limit reductions, traffic management, street space reallocation.

Because traffic has such a strong impact on the quality and usability of local neighbourhood environments, the transport sector makes a critical contribution to the success of 'stay local orders' during lockdowns. Stay local orders are an important tool used to *limit the spread of the virus* during outbreaks of community transmission. If people feel they can meet their basic needs, including needs for connection, restoration and recreation locally, then they are more likely to observe stay local orders. Research on community perceptions of neighbourhood environments during Level 4 lockdown showed that people felt safer and more satisfied with their neighbourhood environments due to the drop-in motorised traffic (Waka Kotahi - NZ Transport Agency, 2020b). People reported that this drop in traffic levels made it easier for them to meet their needs for exercise, social connection, and restoration locally, without needing to leave their neighbourhoods (Wild, 2020).

Traffic management and street reallocation to make it easier and more enjoyable to stay local makes it more realistic and feasible for people to observe lockdown orders. This is particularly important for people who live in *crowded houses* and *high-density areas*, without *backyard space*, for whom stay at home or stay local orders are particularly stressful and difficult (Vancouver Public Space Network, 2020). Reducing traffic *speeds* and *volumes* works to expand the amount of usable public space available in neighbourhoods (Mindell and Karlsen, 2012; Wiki et al, 2018). It also provides extra support to ensure that COVID-vulnerable people, *around a third of our population*, continue to get out into the community and do not feel forced to self-isolate.

Supporting community resilience, and 'buy-in' to elimination efforts

Individuals and communities tend to have a degree of 'surge capacity' that enables them to deal with threats and emergency situations, however, it is difficult to stay in 'emergency mode' for extended periods of time. 'COVID-fatigue' is a real threat to the success of New Zealand's elimination strategy. The experience with SARS showed us that helping people maintain a sense of optimism, trust and feeling of 'belonging' is critical to the effectiveness of infection control. People who feel a stronger sense of trust in others have been shown to be more likely to follow directives to wash their hands and physically distance, for instance, during a pandemic (Puterman et al., 2009). People who start to feel disconnected from their communities on the other hand are less likely to follow public health directives and more likely to believe conspiracy theories (Freeman et al. 2020).

The pandemic, and resulting recession, present a number of threats to people's sense that they can trust and belong of the 'team of five million'. Self-isolating due to fear of contracting the virus, isolation caused by unemployment, financial stress, family harm during lockdowns all weaken social cohesion and our sense of belonging. Although New Zealand has so far avoided widespread transmission of COVID-19, research shows that the experience of living through the pandemic is stressful for our families and communities. In a recent national survey, 13% of New Zealanders said they or a family member had lost a job since the start of the pandemic, while 19% reported having difficulties paying monthly bills. Māori were twice as likely to say they or a household member has lost a job (20% vs. 11%), were unable to pay monthly bills (34% vs. 14%), or had filed for unemployment benefits (27% vs. 10%) compared with Pākehā New Zealanders (Thaker & Menon, 2020). A University of Otago survey on the experience of Level 4 lockdown showed that 30% of participants reported experiencing moderate to severe psychological distress, and almost 1 in 10 respondents reported experiencing some form of family harm during lockdown (Every-Palmer et al. 2020). Loneliness and social isolation also increased during lockdown, with solo parents, youth and unemployed people experiencing the largest increases in loneliness. While 5.8% of youth experienced prolonged loneliness before lockdown, this rose to 20.8% during lockdown, before dropping slightly to a still high 17.0% post-lockdown (Loneliness NZ, 2020).

Previous research suggests that both increases in unemployment and ongoing anxiety about infection are likely to decrease levels of psychological wellbeing and social cohesion in our communities. Research on previous newly emerging infections such as SARS has shown that *'pervasive feelings of hopelessness and uncertainty'* as well as maladaptive 'safety' behaviours such as *hypervigilance and avoidant behaviour* are common responses in a pandemic (Hisham et al., 2020). During Level 4 lockdown, 23% of people in Waka Kotahi's mobility panel reported that they *had not made essential trips due to concerns that they could not safely physically distance* (Waka Kotahi - NZ Transport Agency, 2020b). Previous studies on the experience of living through SARS outbreaks shows that anxiety about crowding in public spaces commonly persists for extended periods after lockdown measures cease (Reynolds et al., 2008; Cava et al., 2005). Anxiety about crowding, and the desire for additional space for physical distancing is likely to be important to New Zealanders at all alert levels until we have a vaccine. If public spaces feel too crowded to use safely, then the use of high streets for shopping, social connection and recreation is likely to decline.

The transport sector can support communities to feel safe and stay connected during this difficult time by ensuring that public spaces and transport spaces both are safe and 'feel safe' for people to continue to use. This will help to reduce levels of anxiety in the community, the 'mental load' of living in a pandemic, as well as ensuring that people can still meet their needs safely. Expanding footpaths so that families can use community spaces safely; and providing additional cycling capacity so that there are safe alternatives to public transport that do not rely on car ownership will be particularly critical for supporting community resilience.

Ensuring that public spaces 'feel safe' will also be critical for the survival of our high streets and central business districts. A policy that relies on messages to work and stay at home during the pandemic not only increases the risk of isolation and loneliness, but it is highly inequitable. Those living in crowded, small houses in dense areas will find this particularly difficult to do (Vancouver Public Space Network, 2020). Making our public spaces, including our neighbourhood transport spaces, feel safer to use will reduce the burden on low-income communities, reduce the risks of isolation, and encourage people to return to our high streets and central business districts. Efforts to create safe transport spaces will likely be even more successful economically when combined with initiatives like safer outdoor dining.

Finally, the transport sector will play an important role in preventing a rise in driving during the pandemic. Public transport remains one of the highest risk transport environments for COVID-19 transmission. Indeed there was a case of COVID-19 transmission on a bus in Auckland at Level 1 in August 2020. As a result, public transport use has dropped (Waka Kotahi NZ Transport Agency, 2020c) and is likely to remain lower during the pandemic as a result of fears about infection. If safe alternatives to public transport are not provided, then we are likely to see a switch from public transport use to driving (Douglas, 2020). There are some signs that this increase in driving is beginning to occur locally, with driving back to pre-COVID levels despite lower public transport use and an increase in working from home (Waka Kotahi NZ Transport Agency (2020c). Providing additional walking and cycling capacity, especially during lockdowns, but also for the next few years while there is anxiety about using public transport use, will help to limit the shift to increased driving.

There are important reasons to avoid an increase in driving in our communities during the pandemic. Increased driving will lead to a rise in air pollution, which increases the severity of COVID-19 outbreaks within communities (Wu et al. 2020). Higher levels of driving will also decrease levels of physical activity and weaken neighbourhood cohesion by reducing local social interaction (Douglas et al., 2020; Mindell & Karlsen, 2012). Increased driving will also further restrict local opportunities for outdoor exercise such as walking, running, cycling or wheeling at a time when there is greater anxiety about using indoor recreation facilities. Research on

psychological resilience during the pandemic has shown that getting outside regularly for exercise is associated with better mental health outcomes for communities (Killgore, 2020).

1.4. New Zealand's transport priorities and goals

In addition to supporting Covid-19 prevention, management, and recovery, there are numerous existing transport policy documents and strategic priorities that support the need to create safe environments for pedestrians and cyclists, increase the uptake of active modes, provide more transport choice, and ensure inclusive access. Strategic priorities in New Zealand's Government Policy on Land Transport 2021/22-2030/31, such as decarbonising our transport system, improving safety, and providing better transport options are central to achieving the desired outcomes of our transport system – inclusive access, healthy and safe people, environmental sustainability, resilience and security, and economic prosperity (NZ Government, 2020). Other key policy documents that align with this direction are 'Arataki' – Waka Kotahi's 10-year view of what is needed to deliver on the government's priorities and objectives (Waka Kotahi NZ Transport Agency 2020a); the 'Road to Zero' Road safety strategy (NZ Government, 2019); and the 2019 Zero Carbon Act (Ministry for the Environment, 2020).

2. RESEARCH METHODS

The research results are based on three phases of data collection: 1) a literature review; 2) interviews with local and international transport staff involved in COVID-19 street space reallocation projects; and 3) using this evidence base to develop and collect feedback on a proposed 'transport response framework' to support future COVID-19 street space reallocation efforts in New Zealand.

2.1. Literature review

A literature review was conducted in order to provide an overview of transport-related street reallocation interventions that have occurred in New Zealand and internationally in response to COVID-19. Most data were collected from grey literature such as news items, reports, and webinars. Published literature was also included as available. In addition, technical documents and guidelines related to COVID-19 street space reallocation were reviewed.

2.2. Interviews

2.2.1. New Zealand responses

To understand how and why the New Zealand responses played out how they did, 10 interviews were conducted with transport sector staff involved in responding to COVID-19 between March and June 2020. Three key cities which planned or enacted responses to reallocate road space or otherwise prioritise walking and cycling were identified using data from Innovating Streets COVID emergency funding applications. These were Dunedin, Wellington, and Auckland. A transport professional in Morrinsville was also spoken to. Phone or online interviews were conducted with local transport authority staff involved in the responses in each of these cities, in which participants were asked what they did, how this was decided and communicated, what worked well, and what could be improved in future.

In addition to the interviews with local transport authority staff, two interviews were completed with central government staff members with oversight over the responses across New Zealand. All interviews were recorded and transcribed, then thematically analysed using the interview questions as a guiding framework. The findings are presented in Section 4.

2.2.2. International responses

Interviews were also conducted with four senior transport authority staff from different cities around the world who were involved in responding to COVID-19. The cities were selected based on their strong focus on reallocating road space. The four cities involved were Bogotá (Colombia), London (UK), Melbourne, and Sydney (Australia). International participants were interviewed online about their city's transport response to COVID-19 using similar questions to those for the New Zealand interviews. Key insights on the COVID-19 response in Paris and Oakland were also drawn from webinars led by transport authority leaders in these cities. All interviews were recorded and transcribed, then thematically analysed using the interview questions as a guiding framework. The findings are presented in Section 6.

2.3. COVID-19 Transport Response – Street Space Framework

Based on the literature and technical guidelines reviewed as part of the literature review, a draft transport response framework, which focuses on street space allocation and aligns with the National COVID Alert Level System was developed. This framework was reviewed again by the authors following completion of the interviews, before seeking feedback from New Zealand transport sector stakeholders on appropriateness and feasibility.

Stakeholders were suggested by Waka Kotahi and included transport sector staff from across the transport system, including those at local authority delivery and management levels as well as staff from central government agencies in the transport sector. Eleven stakeholders were invited to give feedback. They were each sent a copy of the draft framework, an explanation of the framework purpose, and an invitation to either provide written feedback or take part in an individual/group interview.

Feedback from five stakeholders was received (four in local government, and one in central government). This feedback was collated and summarised and is presented together with the proposed framework in Section 8.

3. NEW ZEALAND RESPONSES

This section summarises the key street space reallocation interventions that were implemented in New Zealand towns and cities in response to the COVID-19 pandemic. The section draws on information from interviews with regional staff, news articles, and local government documents (e.g. council meeting minutes). More detail is provided on the responses of Auckland, Wellington, and Dunedin, the regions that were interviewed as part of this research. Images have been used as examples, where available.

3.1. Auckland

The core activities in Auckland's response are below, with more detail for each site outlined in Table 1.

- Temporary pop-up cycle lanes and footpath extensions
- Temporary speed limit reductions
- Decals (markings) on footpaths and signage to encourage physical distancing at various town centre sites (e.g. bus stops)
- Increased pedestrian phases at traffic lights (to reduce wait time), automatic call buttons, and widened crosswalks at some busy intersections
- Enhanced Traffic Management Plans (TMPs) at some construction sites to support construction activity
- Removal of parking charges in the CBD

Table 1: Key sites and interventions in the Auckland region.

Description and Site(s)	Timing of installation	Timing of removal (if applicable)
Queen Street • Footpath extensions and pop-up active mode lanes (reallocation of space from bus lanes), • Existing 30km/h speed limit • Measures to reduce through traffic (e.g. closure of specific sections). **Auckland City Centre** • Changes to pedestrian phasing, automatic call buttons, and widened crosswalks (through temporary orange lines) at intersections and temporary removal of pedestrian fencing at staggered crossings.	Level 3	Intervention remains with adaptations made.
Tāmaki Drive • Temporary active mode lane on the seaside of Tāmaki Drive (reallocation of space from carparking)	Level 3	A ~350m section (between The Strand and Solent Street) removed after ~ 1 week (in response to

		concerns from freight groups about safety, disruptions to vehicle movements, and queuing). The rest removed in Level 2
Ponsonby Road • Temporary footpath extensions and cycle lanes on both sides of the road (reallocation of space primarily from carparking) • Existing 40km/h speed limit	Level 3	~ one week after installation (during Level 3)
Oteha Valley Road • Temporary footpath extensions and cycle lanes on both sides of the road. • Temporary speed limit to 30km/h	Level 3	Removed at Level 2
Lonely Track Road • Temporary footpath extensions and cycle lanes. • Temporary speed limit to 30km/h	Level 3	Removed at Level 2
Auckland schools – 6 sites • Temporary footpath extensions near school gates. • Temporary speed limit to 30km/h	Level 2	

Source: Auckland Transport (2020). AT Covid-19 emergency works. Overview, 24.04.2020. https://at.govt.nz/media/1982581/road-network-ops_emergency-works-map.pdf . Accessed 12 October 2020.

Queen Street

First installation on Queen St

Adaptation of materials on Queen St

Source: NZ Herald (2020). Covid 19 coronavirus: Social distancing cones rolled out across Auckland, 29.04.2020. https://www.nzherald.co.nz/nz/covid-19-coronavirus-social-distancing-cones-rolled-out-across-auckland/OIEHC4TEGTZ2JQTU5ZL52TGQDQ/ Accessed 12 October 2020.

Source: Auckland Transport (2020). Road Network Operations. COVID 19 – CMT Alert Levels 3 & 2 Summary, May 2020.

Tāmaki Drive

Source: NZ Herald (2020). Covid 19 coronavirus: Social distancing cones rolled out across Auckland, 29.04.2020. https://www.nzherald.co.nz/nz/covid-19-coronavirus-social-distancing-cones-rolled-out-across-auckland/OIEHC4TEGTZ2JQTU5ZL52TGQDQ/ Accessed 12 October 2020.

Source: Mackie Research 10.05.2020

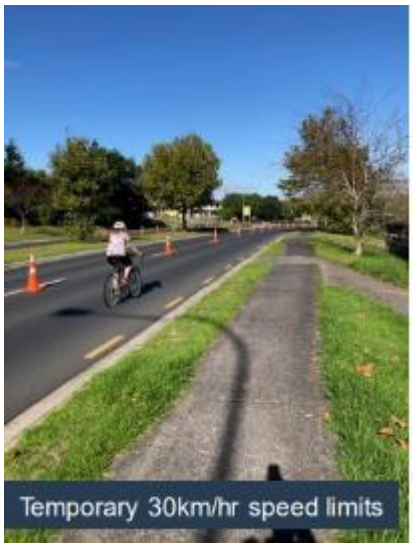
Ponsonby Road

Source: Auckland Transport (2020). Road Network Operations. COVID 19 – CMT Alert Levels 3 & 2 Summary, May 2020.

Oteha Valley Road

Source: Stuff (2020). Coronavirus: Physical distancing cycleway 'farcical', Auckland councillor says, 1.05.2020. https://www.stuff.co.nz/national/300002674/coronavirus-physical-distancing-cycleway-farcical-auckland-councillor-says. Accessed 14 October 2020.

Signage and other interventions



Source: Auckland Transport (2020). Road Network Operations. COVID 19 – CMT Alert Levels 3 & 2 Summary, May 2020.

3.2. Wellington

Description and Site(s)	Timing of installation	Timing of removal (if applicable)
Decals (markings) on footpaths to encourage physical distancing and pedestrians to 'Keep Left'. Various CBD locations.	Level 2 (including Wave 2)	Level 1
Temporary 30km/h speed limit on sections of the south coast between Beaker Bay and Owhiro Bay.	During Level 3 (~May 5)	Level 2
Developed proposals for seven projects – footpath extensions, shared paths, and bike lanes (~7 kms in total). The first tranche of proposals went to public consultation.	Not implemented – proposals withdrawn following Level 1 announcement.	

In addition to the interventions above, Wellington City Council implemented free parking at metred sites during Level 4 and temporarily changed all on-street loading zone restrictions in the central city to P15 to facilitate click and collect during Level 4 and 3.

Source: Wellington City Council (2020) Keeping physical distancing at Alert Level 2, 14.0.5.2020. https://wellington.govt.nz/your-council/news/2020/05/keep-left Accessed 12 October 2020

Source: Wellington City Council (2020) Facebook, 28.04.2020

https://www.facebook.com/wellingtoncitycouncil/posts/2419863901447735

Examples of proposed interventions in Wellington are below.

Point Halswell Shared Path Trial Treatments

Source: Wellington City Council (2020) Pt Halswell Shared Path Trial Treatments

Shared space at Massey Memorial Car Park

Source: Wellington City Council (2020) Pt Halswell Shared Path Trial Treatments

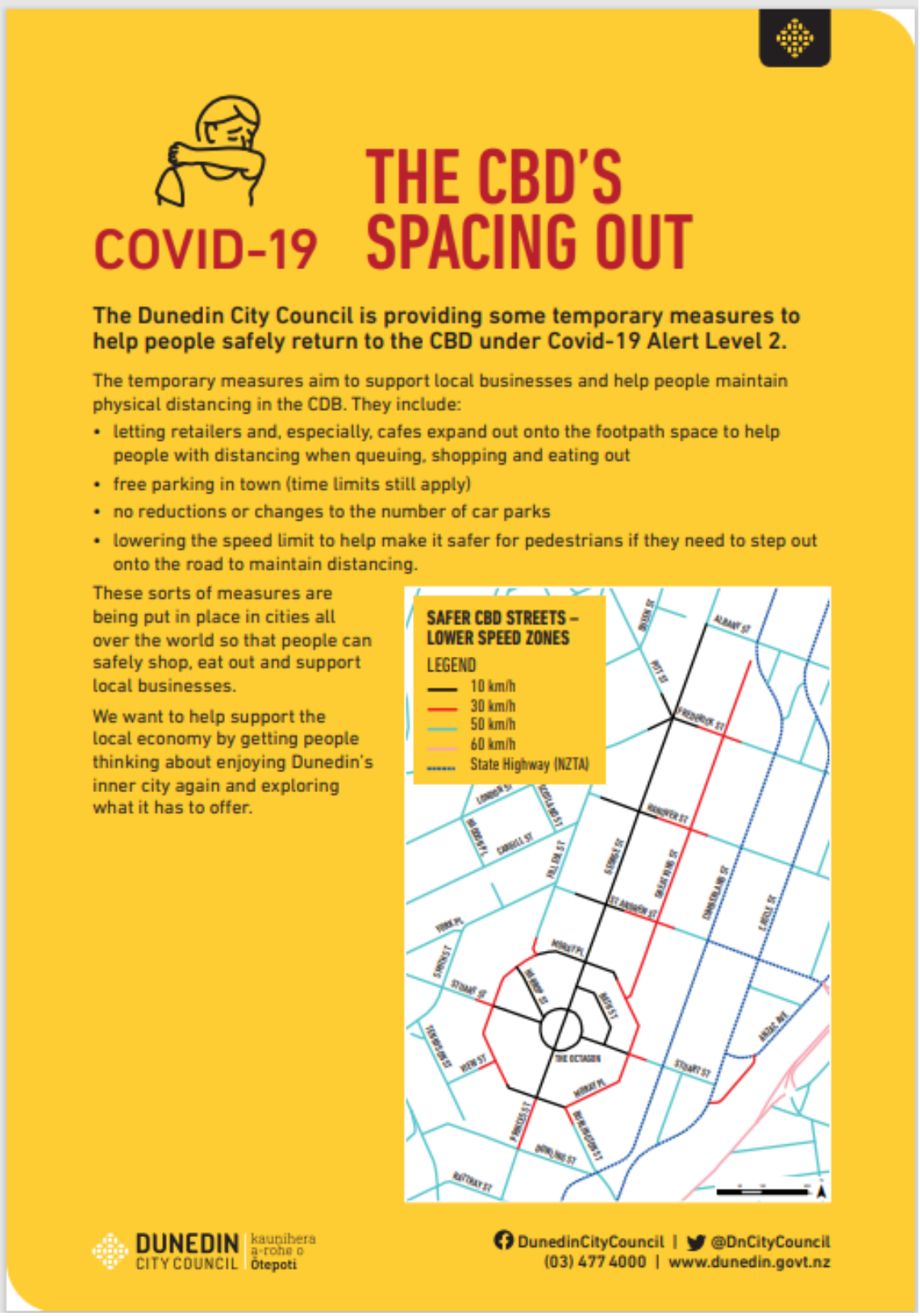
3.3. Dunedin

Description and Site(s)	Timing of installation	Timing of removal (if applicable)
George Street/Princes St, Dunedin CBD		
Businesses allowed to use the footpath on George Street for commercial activity without extra charges.	Level 2	Level 1
Free parking in CBD	Level 2	1st July (~3 weeks after the start of Level 1)
Temporary speed limit of 10km/h (from 30km/h), communicated through signage.	Level 2	Level 1
Colourful dots and stencils on George St to signal a shared space.	Level 2	The dots remain but the stencils were removed at Level 1
Changes to pedestrian crossing phasing – Barnes dance crossing phase after every second vehicle phase.	Level 2	Removed after 5 days

Visual interventions on George St, Dunedin to signal a shared space.

Source: Dunedin City Council (2020). Innovating Streets COP Dunedin Case Study

Public communications in the Otago Daily Times.



COVID-19

THE CBD'S SPACING OUT

The Dunedin City Council is providing some temporary measures to help people safely return to the CBD under Covid-19 Alert Level 2.

The temporary measures aim to support local businesses and help people maintain physical distancing in the CDB. They include:

- letting retailers and, especially, cafes expand out onto the footpath space to help people with distancing when queuing, shopping and eating out
- free parking in town (time limits still apply)
- no reductions or changes to the number of car parks
- lowering the speed limit to help make it safer for pedestrians if they need to step out onto the road to maintain distancing.

These sorts of measures are being put in place in cities all over the world so that people can safely shop, eat out and support local businesses.

We want to help support the local economy by getting people thinking about enjoying Dunedin's inner city again and exploring what it has to offer.

DUNEDIN CITY COUNCIL | kaunihera ā-rohe o Ōtepoti

DunedinCityCouncil | @DnCityCouncil
(03) 477 4000 | www.dunedin.govt.nz

Source: Dunedin City Council

3.4. Christchurch

Description and Site(s)	Timing of installation	Timing of removal (if applicable)
Christchurch City Centre Removal of pinch points (physical constraints) – particularly in relation to temporary fencing/barriers in place for earthquake protection and maintenance sites. Social distancing reminders in areas of high pedestrian/cyclist activity (decals on footpaths and corflute signage on poles).	Level 2	
Coastal Pathway – Moncks Bay Temporary widening works (using TMP process) - a one-way pedestrian system on narrow section of the coastal pathway using a temporary pedestrian refuge. Implemented in response to public concerns about the impossibility of physical distancing on this section, especially given increased volumes of pedestrians and cyclists, and safety concerns given traffic volumes and the 50km/h speed limit. Signage to encourage use of the one-way system and physical distancing. A 30km/h temporary speed limit was also implemented to slow traffic and enable pedestrians to cross the road safely.	End of Level 3, start of Level 2	Level 1

Pedestrian refuge using reflective bollards

Source: Christchurch City Council (2020). Innovating streets for people – pilot fund – Covid 19 response measures. Evaluation report - Coastal pathway – Moncks bay.

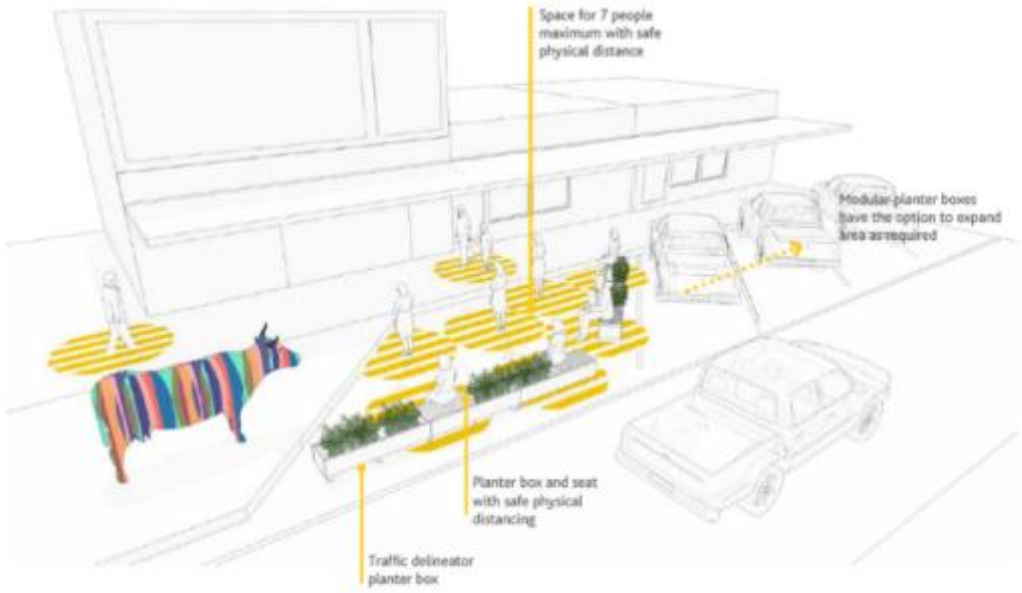
Regulatory and Covid 19 signage

Source: Christchurch City Council (2020). Innovating streets for people – pilot fund – Covid 19 response measures. Evaluation report - Coastal pathway – Moncks bay.

3.5. Other regions

There were responses (or intended responses) in other regions focusing on the reallocation of street space or measures to make it easier to socially distance while using and moving around in public space.

Morrinsville – implemented two temporary street-side seating areas. This involved taking out approximately six car parks near pubs and cafes to create space for seating and waiting areas.



Source: Matamata Piako District Council (2020). Morrinsville Business Bubble Zones. https://www.mpdc.govt.nz/projects/morrinsville-business-bubble-zones

Source: Matamata Piako District Council (2020). Implementation – Morrinsville Business Bubble Zones, June 2020.

Porirua – installed temporary footpath widening on two bridges that link the train station with the town centre. They were implemented in July 2020 and remain in place (as of October 2020).

Source: Porirua City Council (2020). Busiest pedestrian street in Porirua made safer through Waka Kotahi fund, 21.05.2020 https://poriruacity.govt.nz/your-council/news/busiest-pedestrian-street-porirua-made-safer-through-waka-kotahi-fund/. Accessed 12 October 2020

Nelson – 30km speed limit and free parking in the city centre.

Hamilton – removal of fees for outdoor cafes to use the footpath.

4. NEW ZEALAND INTERVIEW FINDINGS

4.1. Insights from local transport staff

This section summarises key insights from interviews with nine local transport staff in Auckland, Wellington, and Dunedin.

4.1.1. Why and how?

The perception was that senior leaders, including councillors and senior executives, were keen to support the public health crisis and gave strong directives to respond to the requirement for physical distancing. As such, the primary rationale for street space reallocation projects was to make it easier and safer for people to physically distance while walking and cycling. Reducing speed limits was perceived to be a key part of ensuring safety. For Wellington, the assumption that public transport capacity would be reduced also underpinned their response. Dunedin's response centred around encouraging people back into the city centre (in a safe way) to stimulate economic activity. In Auckland, in addition to creating space for pedestrians and cyclists at key sites, the enhancement of TMPs at constructions sites aimed to support construction and economic activity at a time when there was less demand on the network.

In the conception of ideas phase, data and existing knowledge of the network were used to identify sites with potentially high volumes of pedestrians and cyclists where issues with physical distancing were anticipated. There was also consideration and desire to align the response with existing projects, plans, and goals for transport. However, a range of factors appeared to largely prevent follow-through on these intentions during the immediate COVID-19 response phase (See Section 4.1.3). Table 2 outlines the main considerations involved in deciding what to implement and where, based on interviews in each region.

Table 2: Key elements in the process of decision-making for COVID-19 street space reallocation interventions, based on interviews in each region.

Auckland	Wellington	Dunedin
• Considered how their approach would move from an immediate response to system recovery overtime and the level of intervention required at each Alert Level. • Considered *evidence-led* actions (sites with high volumes of pedestrians and cyclists and where issues with physical distancing were anticipated) and *opportunity-led* actions (opportunity to promote active modes).	• Considered how to respond with a 'Let's Get Wellington Moving' lens, especially given the reduced public transport capacity. • Reviewed existing plans and past proposals to see what would be appropriate in the COVID-19 context. • Explicit decision not just to act through COVID powers because then interventions would have to be removed - decided on a longer process to enable a potential 'pathway to permanence'.	• In Dunedin, a larger package of interventions was initially put forward to local leaders. • Councillors had ideas about want they wanted and gave instructions to not remove parking or traffic lanes. • Primary focus was on George St in the CBD. • Proposed speed limit reductions seen as extending their existing slow speed zone in the CBD. • Looked at examples from overseas and Innovating Streets for People guidance

• Focussed on the CBD area (e.g. Queen Street), other town centres (e.g. Ponsonby Road), high use recreational routes (e.g. Tāmaki Drive), and some schools. • Queen Street interventions aligned with a planned pilot project.	• Considered community reactions and the need for engagement. • Implemented a speed limit reduction to 30km/h on Wellington's south coast in direct response to community feedback.	when developing their proposals. • Engaged with businesses in the CBD about their needs.

4.1.2. Perceived successes and enablers

Successful interventions

The interventions described as successful were those that received a high level of use by pedestrians and cyclists i.e. the interventions that met a need and aligned with the level of demand, with Tāmaki Drive being the best example of this. Wellington's south coast speed limit reduction was also seen as a success because it was implemented in response to community complaints and there was a good level of compliance, as well as high volumes of pedestrians and cyclists. Rather than responding to pedestrian demand, Dunedin's focus was to encourage people back into the town centre; however, it was largely seen as unsuccessful in doing so.

Other activities, such as the enhancement of TMPs at key constructions sites in Auckland and keeping public transport going were also described as successes.

Some participants also reflected on how deciding not to intervene (e.g in the case of Wellington's temporary walking and cycling lanes) when there was no perceived need or demand could also be seen as a success.

Organisational successes

A number of organisational successes were described by local interviewees – the speed of their response, being nimble, making use of the emergency speed limit rule, and increased collaboration across departments.

Capturing learning from the interventions in Wave 1 was also seen as a positive, and something that could be used in the planning for Wave 2 and future Innovating Streets interventions.

It was also seen as a success that Auckland's COVID-response (and more widely New Zealand's response) was reportedly acknowledged internationally (e.g. Reid, 2020 and NACTO 2020).

Perceived enablers of the response and effective solutions

The Innovating Streets for People Fund was seen as a key enabler of the street space reallocation interventions – Wellington staff described it as a 'sweetener' and 'driver' to act quickly, and Dunedin felt the supporting materials were useful. The public health requirement for physical distancing and Innovating Streets were seen as providing the licence to act. Local leadership also meant the pandemic was prioritised and there was a mandate to direct effort to the COVID-19 response. This urgency and priority given to the pandemic by leaders was seen as overcoming some initial hesitation by some staff and inclinations not to respond out of panic.

Operationally, the Emergency Speed Limit Rule and the TMP process were the main mechanisms used to implement the interventions. In Auckland, the existing Traffic Control Committee also met to quickly approve resolutions.

Other strengths of the response included, developing and sticking to a broader plan/philosophy, maintaining a network focus, and using data to prevent knee-jerk reactions. For example, in

Auckland, initial concerns that the network would be overrun with vehicles at the end of Level 4 resulted in suggestions to remove bus lanes to increase capacity for vehicles. However, continual monitoring of traffic data was key to preventing this and enabling opportunities such as the extension of TMPs on construction sites. Likewise, monitoring of pedestrian and cyclist volumes during Wave 2 partly underpinned the decision not to reintroduce the temporary active mode lane on Tāmaki Drive – apart from a couple of sunny days, volumes were viewed as not warranting re-implementation.

Adapting and refining the interventions overtime, especially in response to feedback from the community and local businesses, was seen as a successful element of the response. For example, on Tāmaki Drive initial design issues (e.g. signage that was a trip hazard, confusion around use) were adapted to improve the solution. Likewise, the continual refinement of the Queen Street installations was described as a positive part of the response, even though there are some ongoing challenges and lower than usual volumes of pedestrians in the CBD.

Creating conversations and a platform for change

There are examples of the interventions spurring future projects, initiating conversations, or introducing new thinking, even if they were taken out or not implemented.

For example, although the intervention on Ponsonby Road was removed there is now a discussion with the local board and businesses about a tactical urbanism project. Likewise, some of Wellington's initial proposals that did not get implemented have now received funding through the next round of Innovating Streets – support for these projects was gathered through the COVID response process. Interviewees felt that all the work that went into developing these proposals and plans has not been lost and can be used in a future pandemic response or for future Innovating Streets projects.

In Dunedin, although some participants felt the visual treatments (dots) may have changed how people thought about the space, the overall response was largely described as unsuccessful. In addition, Dunedin also removed existing parklets on George St as part of the COVID response – interviewees described this as 'losing something'. And, although not overtly stated, there was some intimation that the COVID experience could make it harder to revisit tactical urbanism in the Dunedin CBD in the future, potentially adding another layer to the pre-COVID controversy over such projects.

4.1.3. Barriers and challenges: from conception to implementation

A range of barriers and challenges were reported that impacted the response from conception/planning through to implementation. These factors affected the scope, acceptability, and effectiveness of the interventions and contributed to some interventions being removed or, in the case of Wellington, mostly not being implemented. The most prominent barriers described by interviewees were operational (decision-making, leadership, planning, and engagement) as opposed to absolute legal or regulatory barriers. Some barriers were also contextual and outside the control of local authorities, such as the requirements and timing of each Alert Level.

Time pressure

Although each region was pleased with how quickly they responded (compared to usual processes), working under significant time pressure was described as extremely challenging. In addition, there was a general reflection that response planning should have started much earlier in Level 4. The urgency to act also meant lack of time for community engagement (i.e. no time to mitigate or address community concerns; see Section 4.1.4).

One participant highlighted how the regulatory framework is highly complicated for tactical urbanism projects even in normal times (i.e. speed limits, parking bylaws, commercial use of footpaths), so navigating these processes under time pressure and significant stress is extremely challenging.

Timing and Alert Levels

Interviewees described how the announcement of Level 2 and the lifting of the Civil Defence Act removed the pressing need to respond. In addition, Level 2 (Wave 1), which lasted for 26 days, was perceived as too short to allow for further implementation and refinement of solutions. For example, in Dunedin there were proposals to implement physical measures to slow vehicles down in order to improve compliance with the 10km/h speed limit; however, the length of Level 2 was not long enough to allow this to occur. In addition, there were some broader questions and uncertainty around the need to act at Level 2, and the announcement of Level 1 was felt to completely remove the need to respond.

Initially, identifying who was an essential worker was also a challenge and determined who could go out on the network to support intervention implementation.

In Wellington, there was a perception that if the interventions were implemented through emergency powers they would need to be removed when the threat of transmission passed. This led to the decision to undertake a more comprehensive process, which included public engagement. However, the relatively quick succession down Alert Levels then partly prevented these proposals progressing through to implementation.

Limited perceived need to intervene

The perception that there was no need to intervene (i.e. not as many people in city centres or recreational spaces as anticipated) also prevented plans from being implemented and underpinned the rationale for not revisiting proposals in Wave 2. This lack of perceived need to intervene appeared to be reinforced by perceived community reactions, which is discussed further in Section 4.1.4.

Concerns about backlash and the role of leadership

As highlighted earlier, participants felt there was strong leadership to respond to the pandemic and 'do something'; however, participants also described instances where greater leadership and 'back-up' was desired. For example, in Auckland it was perceived that there was a lack of champions who could publicly support the interventions, particularly for the pop-up cycle lanes.

In Wellington, the removal of parking or majorly changing streets was seen as very risky if businesses were already hurting. Similarly, concerns about a large public backlash meant that most cycleways proposed early on were screened out for being too risky or too impractical. Political support for the proposed suite of projects waxed and waned.

In Dunedin, instructions by councillors not to remove any parking or make changes to traffic lanes went against the technical advice of staff and it was felt this resulted in an ineffective and non-intuitive solution. This was described as being 'hamstrung' by their own rules. Changes to pedestrian phasing at Barnes Dance crossings on George Street were removed after five days, due to disruptions to traffic (despite one of the goals of the intervention being to slow vehicles down). It was felt that controversy over an existing planned project on George St may have contributed to this more conservative approach taken during COVID-19.

Greater central leadership and support was desired in some cases, particularly in terms of the actual interventions (e.g. examples and evidence of what works from around New Zealand and the world). It was felt that this could help staff present and argue the benefits of their proposals

to local leadership. Dunedin was positive about the recent Road Art Rule and suggested that more tools like this would enable higher quality solutions.

Limited accountability in the Innovating Streets application process was raised as an issue by one region. For example, the absence of minimum requirements or a sign-off step meant compromised or ineffective solutions could be implemented, despite being somewhat different to what was initially applied for. In contrast, while others felt greater central leadership might be useful, they could not specifically identify what else central government could do, and the need for local solutions and leadership was emphasised.

The quality of the interventions

In Auckland, the use of orange traffic cones contributed to operational issues, relatively high costs, and negative community feedback. The TMP process as the mechanism for the interventions and lack of other 'kit' underpinned this high reliance on orange cones. There were fears that people would not return to town centres if it looked like a construction site (e.g. Ponsonby Road). The public frequently moving cones contributed to poor compliance and temporary lanes that were not easy or attractive for pedestrians and/or cyclists to use. In Dunedin, participants reported that the lack of physical measures to meaningfully slow vehicles down (i.e. sole reliance on signage and road art), meant they were unsuccessful in creating a shared space in which pedestrians felt comfortable to use the road for physical distancing.

Funding and procurement

Although Innovating Streets funding was highlighted as a key enabler of the response in each region, there were challenges and issues. There was lack of clarity around funding criteria, in particular the 'emergency works' category, and some inconsistent messaging was described regarding the ease of access to funding. For Auckland this meant losing funding when interventions were taken out and contributed to a more cautious approach in Wave 2. Fast-tracking procurement processes for implementation contracts was also challenging and created some issues afterwards.

Other barriers

A lack of police enforcement was discussed as a possible barrier to effective interventions. There was uncertainty around whether interventions were enforceable or not under the regulation framework (e.g. pop-up cycle lanes) and in other cases police were not keen on enforcing changes (e.g. 10km/h speed limit on George St, Dunedin).

It was also highlighted that response planning was all being done via online meetings, which made it harder to communicate proposals and gauge the reactions of decision-makers.

4.1.4. Community engagement and public reactions

Communications and community engagement were amongst the biggest challenges in the COVID-19 response. Participants generally reflected that these elements could have been done better e.g. greater involvement of local communities and with more comprehensive and regular communication. However, there was uncertainty around how to engage in these circumstances, particularly because of the time constraints, and questions around what is appropriate. There were feelings of not wanting to surprise people, or place extra pressure on businesses through loss of parking, but also strong desires to 'do something'. Table 3 summarises the main communication and engagement activities reported in the interviews.

Table 3: Key communication and engagement activities in each region.

Auckland	Wellington	Dunedin
• Mainly AT website and twitter communications. • Interventions framed as a health response rather than a transport response. • Once the interventions were implemented, reviewed customer complaints/comments, did public intercept surveys at key sites, and analysed social media comments.	• Some formal consultation occurred on the first tranche of proposed projects - received a lot of submissions despite fast tracked process. • Purpose framed as for physical distancing and cycleways to manage reduced bus capacity. • Communications campaign to inform the public of the 30km/h speed limit on south coast.	• Enterprise team (part of DCC) engaged with local businesses. • Social media and local media used for communications. • Intervention framed as supporting the local economy and helping people maintain physical distancing. • Community survey in Level 2 to gather community feedback on the intervention.

Interviewees reported that there was public support for some of the street space reallocation projects, with examples being positive comments from the community about Wellington's South Coast speed limit reduction and from advocacy groups in Auckland. Community feedback led to the improvement of interventions on Tāmaki Drive and Queen Street, and support gathered during COVID-19 consultation in Wellington provided an impetus for progressing these proposals once lockdowns were lifted.

However, interviewees also described how negativity tended to dominate most of the feedback and publicity around the interventions that were implemented during the Alert Levels. In Auckland, the opposition tended to focus on the use of orange cones and the loss of parking. There were fears, especially from local boards and businesses, that the cones would prevent people coming back to the town centres. For others, removing a traffic lane was seen as illogical. In Dunedin, negativity centred around the use of the coloured dots - not understanding their purpose and the view that it was a waste of money. Barnes Dance crossings were also removed in response to public complaints about congestion and traffic blocking access to driveways.

In Wellington, there was a sense that there were strong tensions around the temporary cycleways and footpath extensions, with strong support both for and against the proposed solutions. There were concerns from local leaders about rushing ahead and receiving large backlash because they hadn't consulted properly.

Some key reflections from interviewees on public reactions and engagement are below.

- A lack of understanding of the 'why' – there was a perception that the public and certain groups thought the interventions were unnecessary, because of the low numbers of people out and about (e.g. Queen Street)

- Limited buy-in to the fact it was a health response even under a pandemic scenario – the perceived lack of community transmission of COVID-19 was a key argument against the interventions and contributed to an 'infrastructure by stealth' view.
- The why needs to be clearly articulated, including a proactive position emphasising that prevention is better than the cure.
- An ineffective solution makes it hard to communicate the purpose and the 'why'.
- A longer lead-in time would have allowed for more communication.
- There was difficulty managing the tension between the need for clear communications at a time when everything is fluid.
- There were also comments about people starting to abandon physical distancing practices in some places, which made it harder to explain the rationale for streetscape changes.

4.1.5. Future opportunities

Transport response to future COVID-19 outbreaks

Interviewees report that they are now more prepared to deal with future outbreaks. In Auckland, plans are being developed for how to respond at each Alert Level and there is a Crisis Management Team that can be convened when needed. Wellington's proposed designs for footpath extensions and pop-up cycleways developed during Wave 1 are not seen as wasted effort and can be re-introduced if they are needed. Finally, while there are reports of significant learning through the experience, there are remaining challenges, such as identifying where the demand will be and questions around community engagement.

Local government views on how the transport sector can combat future COVID-19 outbreaks are summarised below.

- Future actions to deal with COVID-19 should focus on where the need or demand is (e.g. areas where there is evidence of high numbers of active users). Some participants thought that to warrant a response there needed to be sustained increases in active users, rather than just on weekends, and that there may not be a need to respond in Level 2.
- There was a common reflection that behaviours are different during Levels 3 and 4 (more recreational and local) compared to Levels 1 and 2 (more commuting and activity in town centres), which means the response needs to be tailored accordingly. In addition, participants reported that people's behaviours changed across Waves 1 and 2 (e.g. Level 3 in Wave 2 was busier on the Auckland network than Wave 1), which makes it harder to develop an evidence-based plan.
- Interviewees identified that there is an opportunity to focus more on residential and suburban streets, where people spend their time during Level 3 and 4. For example, slow speed zones and supporting access to suburban shops and services.
- There was some support for a nationally streamlined 'tool kit' or suite of 'cookie-cutter' interventions, including materials, a design process, and engagement steps, which could help regions respond quickly and also prevent doubling-up on work across the country. Within this, it was suggested that Waka Kotahi needed to have a double-role, as both a funder and a leader of good practice solutions.

Community resilience and recovery opportunities

There were a range of views on how transport interventions could support community resilience and recovery.

- Reflections and conversations about the increased walking and cycling during Level 4 and the potential to build on this.
- Recognition that transport interventions could help stimulate more activity in town centres (and suburban centres) as well create opportunities for people to live differently. For example, use their streets and residential spaces differently.
- There was acknowledgement of the need to create transport choice and that the provision for cyclists is generally poor. Although interviewees recognised COVID as presenting an opportunity to support cycling as a transport mode, a range of factors and barriers prevented this from playing out as desired.
- The opportunities for slower speed zones and cycleways to support health and wellbeing, although some felt this health focus shouldn't overshadow the wider realm of transport – moving people and goods.
- The need to incorporate COVID response into project plans and risk registers.
- It was also acknowledged that there are easy and logical links to transport strategic priorities and a range of goals/co-benefits, but the core challenge is understanding how to take the story to the public and get public buy-in.

Insights from Morrinsville

Insights based on informal conversations and presentations on the Morrinsville Business Bubble Zones.

Matamata-Piako District Council implemented two 'business bubble zones' on the main commercial street through Morrinsville in June 2020, following observations of queuing outside takeaway restaurants and cafes during Alert Level 3. The business bubble zones aimed to provide space for people to physically distance while waiting for their orders.

The bubble zones were proposed by an elected member and then championed within the district council as both a pandemic health measure and an opportunity to initiate public conversations around the use and design of the street. The measures were planned and implemented much faster than is considered usual for street change projects, and were considered successful in this regard. They were implemented at Alert Level 1 and remain in place. Local businesses, as well as the business association, were consulted through door-knocking before they were installed.

Monitoring of the impacts included measurement of vehicle speeds a few days before and two days after the changes were completed and showed average speed reductions of 8km/h westbound and 31km/h eastbound. Public consultation following installation was also carried out, and the council social media pages monitored: the large majority of public feedback was negative and related to concerns around loss of parking and the perceived lack of value for money. Use of the areas was not measured but was reported anecdotally as low during the winter months when they were first installed, with more use as the weather improved in spring.

While the measures were not linked to a specific plan or strategy to improve pedestrian amenity along the street, this was a broad goal of council, and the measures have reportedly been effective in starting conversations about how the spaces could alternatively be used. A wider refurbishment project (that did not include increases to pedestrian space) for the street was already being planned before the measures were implemented, and the pandemic impacts on local businesses, together with the business bubble zone project, appears to have contributed to an increased appetite for improving pedestrian amenity in the area long-term. As such, the refurbishment project is likely to involve more comprehensive changes to the street than originally proposed. The business bubble zones are likely to remain in place until the wider refurbishment project is out for public consultation.

Key insights include:

- Installation of the measures at Level 1 (rather than implementing them earlier, at a higher Alert Level) may have contributed to their being maintained longer-term, as the rationale for their installation was not undermined by the shift down Alert Levels
- Despite a strong negative reaction to the measures, they appear to have stimulated public conversations about the use and design of the street
- The successful implementation of the business bubble zones may have helped council to get further funding support for other projects aiming to improve pedestrian amenity
- Council has learned that a strong co-design approach is important for tactical urbanism projects, including some that are currently in planning for other towns.

4.2. Insights from central government experiences

We conducted two interviews (total of four participants) with central government staff who had been involved in planning the COVID-19 response.

4.2.1. The COVID-19 response

The central government staff involved in planning the COVID-19 transport response noted that there were a number of priority areas during the early stages of New Zealand's pandemic response, including:

- Keeping supply chains running. Supporting transport activities that have an economic benefit was identified as particularly important.
- Maintaining driver licensing and registration processes.
- Keeping transport construction and maintenance projects going.
- Working with transport operators to provide guidance on how to operate safely and keep staff and customers safe.
- Keeping public transport running for vulnerable users.
- Supporting contact tracing on public transport.
- Using transport infrastructure to promote COVID-19 public health messaging.

Overall, there has been a strong focus on ensuring that formal, commercial 'transport operations' can continue to function safely. The elimination goal was understood to mean keeping things as 'normal as possible'. Support for walking and cycling did not come through as an important priority to date. It was perceived that it was difficult to ask people to adopt new travel behaviour when 'perhaps the crisis doesn't seem so bad' in New Zealand and people are 'keen to get back to normal'. Central government staff also noted feedback from local government staff that they were anxious about the cost of temporary traffic management for street space reallocation projects. Encouraging people to work from home, or travel off-peak was seen as a more important strategy; however, it was noted that this is now a 'difficult balancing act' because it has a negative economic impact on café holders and store owners in central business districts.

4.2.2. Lessons learnt

The early days of the COVID-19 response were hard work and a learning experience for the transport sector: "we hadn't done this before, we were sprinting for four or five months." Effective collaboration with and support for transport operators and their staff, and particularly working together to find a way to keep public transport running for vulnerable users during lockdown was seen as a key success of the response. Now that we are at Level 1, in 'peacetime', there was some support for considering how interventions such as street reallocation could help support community resilience and the prevention of further outbreaks. It was suggested that it may be helpful to have some clear principles attached to the proposed transport response framework that make it clear that street reallocation is an important priority, such as: "We are going to reallocate space" and "we are going to prioritise active modes."

5. INTERNATIONAL RESPONSES

This section outlines examples of street space reallocation projects implemented internationally in response to COVID-19. This is a snapshot of different types of interventions, rather than a compendium of all international responses. In many cities a suite of interventions was implemented as part of their overall response. Section 6 summarises key learning, experiences, and challenges from several of these international examples.

The International Transport Forum estimated that more than 150 cities had deployed emergency cycling and walking infrastructure by late April 2020 (International Transport Forum, 2020). A large focus has been placed on alleviating pressure along transport corridors and/or improved access to specific destinations like hospitals. Cities like Paris, Milan, and Bogotá rapidly developed ambitious plans for region/city-wide networks of emergency cycling and pedestrian infrastructure, often complementing or adding to existing infrastructure networks. Other cities, such Valencia and Barcelona in Spain, have created space to enable physical distancing in areas of high pedestrian activity (e.g. at large intersections).

In Europe alone, based on estimates from the European Cyclist's Federation, more than 1000km of cycleways have been implemented in European cities since the start of the pandemic (Figure 1) (European Cyclist's Federation, 2020), which is nearly half of what was proposed. Seventy five percent of these interventions in Europe have been cycle lanes/tracks with nearly 20% traffic calming or traffic reduction (Figure 2).

Figure 1: Estimates of cycleways announced vs cycleways implemented in European cities.

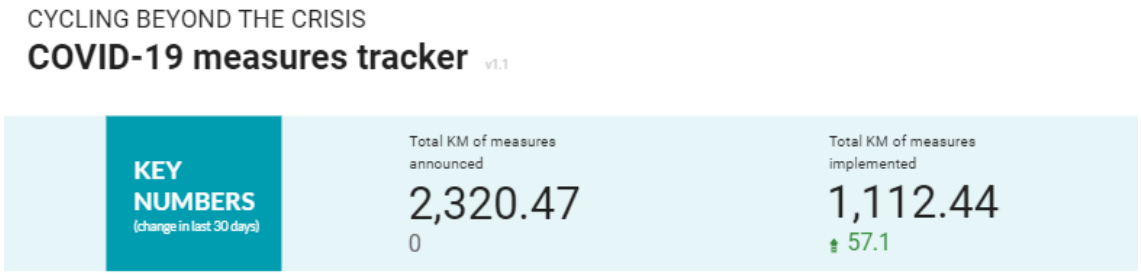
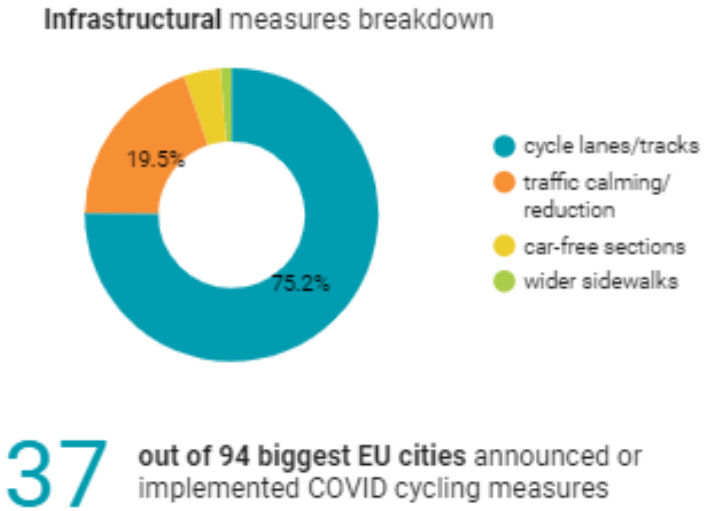


Figure 2: Estimated breakdown of infrastructure measures in European cities.



Source: European Cyclists' Federation (2020). COVID-19 Cycling Measures Tracker. https://ecf.com/dashboard. Accessed 27 October 2020

5.1. Temporary cycle lanes

City	Key points	Source(s)
Bogotá, Columbia	• 76km of temporary bike lanes on main streets in place of vehicle lanes to reduce crowding on public transport, help prevent the spread of COVID-19, and improve air quality.	https://www.smartcitiesworld.net/news/news/bogota-expands-bike-lanes-overnight-to-curb-coronavirus-spread-5127
Berlin	• Temporary bike lanes made up of red-and-white warning beacons, temporary signs and yellow foil barriers.	https://www.dw.com/en/coronavirus-pandemic-gives-cyclists-more-road-in-berlin/a-53176110
Paris	• 50km of lanes normally used by cars reserved for bicycles to limit crowds on public transport.	https://www.france24.com/en/20200505-paris-to-turn-more-streets-over-to-bicycles-as-covid-19-coronavirus-lockdown-lifts
Mexico City	• 54km of new pop-up cycle lanes using recycled materials.	https://news.trust.org/item/20200906182335-6dx13
London	• Temporary cycle lanes on strategic routes	https://www.london.gov.uk/coronavirus/coronavirus-covid-19-faqs/what-mayor-doing-help-people-walk-and-cycle-more
Sydney	• 6 new cycle routes announced, using road dividers and painted markers to allow for quick installation and adaptation. Temporary footpath widening in areas of high pedestrian activity.	https://news.cityofsydney.nsw.gov.au/articles/6-new-cycleways-for-sydney-riders-in-response-to-covid-19 https://www.intelligenttransport.com/transport-news/99006/sydney-fast-tracks-safer-walking-and-cycle-routes/
Melbourne	• Announced plans to fast-track bike lanes along key routes, with 20km planned for 2020-21. Use of plastics, rubber, and recycled materials to accelerate delivery.	https://www.racv.com.au/royalauto/moving/news-information/pop-up-bike-lanes-melbourne.html

An emergency bike lane in Bogotá, Colombia, March 2020. Photo by Gabriel Leonardo Guerrero Bermudez/iStock. Source: The City Fix (2020) https://thecityfix.com/blog/coronavirus-biking-critical-in-cities-alejandro-schwedhelm-wei-li-lucas-harms-claudia-adriazola-steil/

An emergency bike lane in Paris. Source: NACTO (2020) https://nacto.org/publication/streets-for-pandemic-response-recovery/

Pop-up cycleway in the City of London. CARLTON REID

Source: Forbes (2020) https://www.forbes.com/sites/carltonreid/2020/08/18/pop-up-coronavirus-cycleways-deliver-3-billion-in-annual-health-benefits-across-europe/#67f07ea76ad7

5.2. Wider footpaths, walkways, and waiting areas

City/Country	Key points	Source
Dublin	• Removal of loading bays and parking spaces to provide additional space for pedestrians in busy areas.	https://www.irishtimes.com/news/ireland/irish-news/coronavirus-dublin-city-council-to-implement-emergency-social-distancing-measures-1.4231576
Oakland	• Installed 15 intersection improvements to support safe crossing and access to essential services (e.g. grocery stores, and Covid-19 test sites).	https://cao-94612.s3.amazonaws.com/documents/Oakland-Slow-Streets-Interim-Findings-Report.pdf
Barcelona	• Footpath widening on key routes, and daily closure to traffic of 34 side streets from 9 am to 9 pm, except for accessing car parks and for service vehicles. • Creation of ~ 43,000 m2 of pavement space through planned removal of parking for motorcycles (with provision for them to park on road surfaces or in underground car parks).	https://www.barcelona.cat/covid19/en/lockdown-exit-strategy-city
London	• Creating space for physical distancing on pavements in busy high streets by taking out car parks, also widening bus stops.	https://www.london.gov.uk/press-releases/mayoral/mayors-bold-plan-will-overhaul-capitals-streets

Oakland, intersection treatment to support safe crossing. Source: https://cao-94612.s3.amazonaws.com/documents/Oakland-Slow-Streets-Interim-Findings-Report.pdf

5.3. Slow speed zones and partial street closures

City/Country	Key points	Source
Brussels	• 20km/h slow speed zone created in the downtown area to allow pedestrians to walk safely on the road.	https://nacto.org/publication/streets-for-pandemic-response-recovery/
Oakland	• A network of 'slow streets' - discouraging through traffic on certain local streets to support safe physical activity and alleviate overcrowding in parks and on trails.	https://www.oaklandca.gov/projects/oakland-slow-streets
Milan	• 20km/h slow speed zones, to complement other interventions (e.g. emergency cycleways and sidewalk-widening)	https://www.archdaily.com/938202/people-to-reclaim-streets-in-milan-in-post-covid-19-vision-of-the-city
London	• Supporting low-traffic neighbourhoods by reducing through-traffic on residential streets.	https://www.london.gov.uk/press-releases/mayoral/mayors-bold-plan-will-overhaul-capitals-streets

Brussels walking space. Source: NACTO (2020) https://nacto.org/publication/streets-for-pandemic-response-recovery/

Oakland 'Slow Streets' closed to through traffic with cones and signage. Source: City of Oakland (2020) https://www.oaklandca.gov/projects/oakland-slow-streets

5.4. Creating space for street life

City/Country	Key points	Source
Cincinnati, USA	• Allowed cafes to use parking spaces for outdoor seating.	https://nacto.org/publication/streets-for-pandemic-response-recovery/
Vilnius, Lithuania	• Opened 18 public spaces in Vilnius for outdoor seating and dining at restaurants and bars.	https://nacto.org/publication/streets-for-pandemic-response-recovery/
London	• Closed some high streets to vehicles and promoting outside eateries on pedestrianised streets (e.g. Soho).	https://www.london.gov.uk/press-releases/mayoral/mayors-bold-plan-will-overhaul-capitals-streets

Credit: Albert Cesare/The Enquire

Credit: Go Vilnius

Expanded outdoor seating in Cincinnati and outdoor dining in public space in Vilnius. Source: NACTO (2020) https://nacto.org/publication/streets-for-pandemic-response-recovery/

5.5. Other interventions and initiatives

There are numerous examples of signage and markings to support physical distancing at public transport stations, bus stops, and near essential services.

In some cases, other initiatives have been deployed to support the use of emergency infrastructure and enhance accessibility. For example, France has announced, accelerated or enhanced the following measures to support the overall COVID-19 response and ongoing recovery:

- A cycling jobs academy (e.g. bike mechanics and instructors)
- Up to 400 Euro reimbursement for commuting by bike (per year)
- A 50 Euro voucher for people to fix their bike or a mentoring voucher (session with an instructor)
- Central government grants to local authorities for bike parking
- Up to a 600 Euro subsidy for electric bikes.

Source: Armand, B (2020) Webinar: 'The Big Street Reclamation in France'. Published by the Urban Cycling Institute. https://www.youtube.com/watch?v=3Cvci9k6ISc

6. INTERNATIONAL INTERVIEW FINDINGS

6.1. London

6.1.1. Background

The Greater London Authority (GLA) is the regional government agency in London. It oversees and sets the strategic direction for Transport for London (TfL), the transport provider. The GLA controls approximately 5% of London's roads, and works with the 33 Boroughs that control the remainder of the network in London.

The GLA walking and cycling team, which includes ten staff, prepares policy and provides support for both the Deputy Mayor for Transport and the Commissioner for Walking and Cycling for London.

The multi-million pound Healthy Streets initiative was the anchor point for TfL's cycling strategy, pre-COVID. However TfL relies on fare revenue and advertising, so the COVID lockdown led to a serious funding shortfall. Consequently there was an across the board spending freeze, blocking further work on Healthy Streets.

6.1.2. The COVID response

GLA worked closely with central government, including the Prime Minister's office, to obtain special funding of £55 million for walking and cycling. The impetus came from physical distancing rules which more than halved the capacity of buses and the Tube. This meant that millions of journeys had to be moved rapidly to walking and cycling. Adding to the urgency were deaths of bus drivers caused by COVID that occurred early in the pandemic.

Public messaging was 'do not travel if you can avoid it'. Cars were not specifically discouraged, but GLA was anxious that a surge in vehicle traffic would seriously aggravate local air pollution (a well-known and serious health issue for central London). The congestion charge was suspended initially, but as part of the funding agreement with central government it was brought back, and indeed was extended to 10pm in the evening, and to cover weekends also.

COVID interventions included middle door boarding on buses, screens for drivers, and stickers on footpaths and in buses to reduce crowding.

The 'Street Space Programme' included:

- More room for physical distancing on pavements in busy high streets (achieved by taking out car parks, widening bus stops)
- Closing some high streets, e.g. those with busy markets, to cars entirely
- Promoting outside eateries e.g. pedestrianised streets in Soho
- Strategic cycling routes (accelerating existing plans)
- Extending low-traffic neighbourhoods (reducing through-traffic on residential streets to enable more people to walk and cycle)

Wider bus stops to assist physical distancing (Greater London Authority)

Car-free high streets (Greater London Authority)

The Street Space programme was based on a five year strategic analysis that had been carried out pre-COVID. Early in 2020 the modelling was re-run to identify where people could be shifted most effectively from the Tube to walking and cycling. The results supported upgrading existing infrastructure to include protection from traffic where it was lacking, and accelerating the implementation of bike lanes that were already 'on the books', using temporary materials.

Business as usual means lots of iterations, to-and-fro discussion and numerous disagreements. In the time of COVID, it was recognised that GLA must work in a different way, and it did this using permissions that were already available, but seldom employed. The enabling regulations included temporary powers that apply in emergency situations, and provisions for experimental street changes. Under the experimental orders, changes must be consulted on within six months, and a decision made within 18 months on whether the new arrangements stay long-term. Experimental orders had been used in the past only occasionally, by a few Boroughs, but since COVID have been widely applied in London.

Using these temporary and experimental traffic orders, there was no need for the usual traffic modelling or the standard processes of public consultation. Temporary materials were used. When changes had to be made (e.g. because of effects on bus movements) these could be done quickly, and in the main, the rapid street changes worked well.

Action on low traffic neighbourhoods has been led by Borough Councils – the 'mini-Hollands', for example – and their function has been mainly to filter rat-running. However, lockdown led to fresh interest in these interventions, due to the experience of quiet streets, and the large numbers of people cycling and walking. GLA encouraged the low traffic neighbourhoods to both enhance community cohesion, and as a means of promoting walking and cycling. There were political challenges, but more Councils than ever before are involved.

Converting inner city streets in Soho to outdoor dining spaces (Greater London Authority)

There has been some pushback to the experimental orders, and a few of the pop-up bike lanes have been taken out. However these make up only a couple of kilometres across a programme of about 85km to date. The value of these orders is that people get to try the new roads, rather than arguing against the prospect of new roads. And it is possible to evaluate them and to collect data on how they work, so an informed decision can be taken after six months.

Changes in roads around Regents Park – dedicated bus lanes and pop-up protected cycle lanes (Greater London Authority)

6.1.3. Lessons that may apply to New Zealand

Support from central government was driven by the Advisor in the PM's office (Andrew Gilligan). He was formerly the cycling man for Boris Johnson when Boris was Mayor of London, and recently Andrew was the person responsible for the new Bike Strategy for England.

It has been high stakes, working at speed, and this means mistakes are made. In one example, Post Office vans were blocked by street changes, some mail boxes were not accessible. But paying close attention to unexpected effects, and responding rapidly has reduced disruption. In the city cycling is up about 20%, vehicle traffic levels are 70-80% of 'normal', the Tube is about 30% and buses 60% of what would be expected.

What hasn't worked so well: the materials used for bike lanes and street changes are relatively cheap and often not so attractive. There was an ambitious plan in Central London to dramatically lower traffic which didn't come to pass, but the financial area (the City of London) has taken a good deal on board, with many one-way streets.

The London experience, we were told, is that high-level political buy-in made things happen more quickly. There is opposition still to changing the historical pattern on the streets. But London has accelerated trends that were already taking place, such as increasing cycling and walking trips, and growing popularity of quiet streets. In some respects the city has achieved in six months what was expected to take decades.

6.2. Sydney

6.2.1. Background

Transport for New South Wales (TfNSW) is the agency responsible for 'everything that moves' across the state. In NSW local government responsibilities and powers over transport are more limited than in other Australian states. For instance, councils don't have approval powers over changes to local streets – this authority is held by TfNSW.

6.2.2. The COVID response

The Walking and Cycling Strategy group at TfNSW has been responsible for:

- Streets as Shared Spaces (this preceded COVID and was modelled on the Tactical Urbanism project in New Zealand)
- Automated pedestrian signals
- Pop-up cycleways
- Engagement with communities
- Speed restrictions

Source: Transport for New South Wales

Early in the pandemic, a Health Order was obtained by TfNSW under the emergency powers regime. The Order enabled the Department to install street changes without local consultation (it was still in operation in early September – and TfNSW was seeking an extension). But where street changes had significant impacts (especially on car parking), TfNSW judged that it was important to engage with local stakeholders in any case.

Pop-up cycle way in Sydney (Transport for New South Wales)

Pop-up cycleways were initially placed only in the Sydney city centre, but are now being rolled out in the next ring of councils. There is a 'Community of Practice' set up, including TfNSW and Council reps, covering practical issues such as funding, design and insurance. Some cycleways have also been installed in regional centres – these have generally been more straightforward than the Sydney changes.

It was thought important to combine the cycleways with speed restrictions, due to the physical limitations of the separators (see example in the photo above). In general this meant a 40km/h limit.

There has also been area-based traffic-calming: speeds were reduced to 30 km/h at Manly Beach, Liverpool CBD in Western Sydney and central Newcastle. Note that Councils had been working before the pandemic on these changes; with COVID the new limits were brought forward.

How did this happen? The important factors, we were told, were strong support from senior leadership in the department, and creation of new structures to move quickly and make change. A new entity, the Fast Track Installation of Public Roadside Spaces included Executive Directors from across TfNSW. The leader of this group had a seat on the TfNSW Executive (this was a new position.) The Fast Track group is considering not only installations but also regulatory changes that may be required.

Note the actions were all internal to TfNSW – there was no need for approval from other agencies. There was no need for new legislation.

6.2.3. Lessons that may apply to New Zealand

Three important factors in the NSW successes, we were told, were:

- Executive support (including the strong and visible support of the Secretary (the CEO) who modelled personally what was needed, with lots of photos of him on a bike).
- A positive culture and ethos within TfNSW (summed up as 'you can't say no').
- Legislative enablers: it was possible to build on permissions for emergency works by local governments.

There was already a business case for cycling across Greater Sydney. This was a multi-year year plan, put together on a co-design model with councils, and backed up by economic modelling. The plan had been ticked off by Infrastructure NSW, so when COVID came the business case could be modified and applied quickly (in two months rather than eight years).

The rationale for cycleways and street changes was clear and repeated frequently: COVID brought the need to change behaviours, to reduce travel overall, to switch times to avoid crowding, to reduce public transport congestion. TfNSW was conscious that a switch from public transport to private cars was not sustainable. Therefore more options were required for walking and cycling.

The organisation had to work in a new way – this was a challenge for some sections, and strong support from the Secretary was critically important. A technical report describing street changes for COVID was well-received.

What didn't go quite so well – TfNSW is still developing a monitoring and evaluation framework. And person power was depleted: staff were exhausted, trying to add COVID related work to their usual jobs.

The future – the cycleways on priority routes will be kept. Community feedback indicates there is some unhappiness but generally there has been a positive public reception. The speed limits – it is not clear at this stage what will be decided.

6.3. Melbourne

6.3.1. Background

The Department of Transport Victoria (DoT) used to be three departments covering separately public transport, roads and transport policy. Recently merged, we were told it is 'now easier to coordinate with local government', and 'easier perhaps to get people to work in new ways', though there are 'still some dark corners in the Department'

In Melbourne it is the inner city councils that have taken the lead with pop-up bike lanes and other COVID initatives in the streets. Especially the City of Melbourne. Note that this Council covers only 38Km^2 and has a residential population of about 180,000 people, but due to the concentration of business premises has an enormous rates base (and deep cash reserves).

6.3.2. Response to COVID

When the pandemic hit Australia, active transport planning across the city was led by DoT, and it was clear that walking and cycling were necessary to relieve pressure on public transport, especially close to the centre of Melbourne. Modelling by the DoT showed that driving in private cars could not cope with public transport displacement, there was just not enough road

space, and the parking requirements would be excessive. It was estimated that pop-up bike lanes running parallel to arterials could substitute 20-30,000 trips morning and night. There was strong reference also to experience overseas (Paris and New York especially).

This modelling led to a plan that expanded space on the roads for bikes. Note – staff in the DoT had been working on the pop-up bike lane approach for ten years but there were mixed views on how this should be done within the organisation.

At first State Treasury did not accept the rationale, and this led to many iterations of the plan. Other initiatives were signed off earlier (public transport timetable, Drive Easy, traffic management), but the proposal to install extensive pop-up bike lanes was signed off in September and it was expected that work should be completed pre-summer.

6.3.3. Lessons that may apply to New Zealand

What made it possible – City of Melbourne support was critical (especially as the City was paying for the street improvements). Modelling was valuable but backroom lobbying was critical. There was a change in Minister in August. A complementary initiative was expansion of outdoor dining in the city. The narrative was economic recovery, 'getting people back in to the city', and on this basis there was support for street closures and removal of some car parks. When these changes were made the environment for bikes was improved, but it was not the primary aim.

Barriers – some in the DoT thought it important to retain conventional ways of appraising road changes and in particular traffic flows. In the State government a sticking point was financial analyses that did not fit the case for opening up road space. At the political level there was disagreement within Cabinet.

In the DoT the block was overcome by clear explanation of why new protocols were needed. There was pressure for change from the CEO City of Melbourne and the Premier's Office. Executive leaders at the DoT were ready for expansive thinking.

At the same time it was recognised that 'needs vary depending on which bit of the city you are dealing with'. The COVID response for active travel began as an inner city initiative, given population density, trip lengths and prevailing mode use. It was understood that circumstances were different in outer suburbs.

What to do to build resilience? We were told the outdoor dining initiative was a reminder of how important it is to bring people together. Many popular café and dining areas in Melbourne are on busy roads meaning that a neighbourhood focus and effective traffic management are important. Lots of road space needs to be re-purposed, but the severity of the pandemic and the economic consequences mean that closures, loss of car parks and speed limits have been accepted. This has occurred more rapidly perhaps than if the changes were required solely for bike lanes.

The community response varied a good deal between different parts of the city, even in the inner city councils. Where pop-up bike lanes have been installed, will they survive after COVID? Our informant thought they probably would. He noted that DoT is developing a monitoring and evaluating framework based on the Calgary model, using a variety of metrics, and this will, it is hoped, support decision-making about long-term street changes.

We note that following our interview, on October 7 2020, the Minister for Roads announced:

'the Coronavirus pandemic is changing the way we move around Melbourne'

'100 kilometers of new and improved cycling routes will be delivered across key inner-Melbourne suburbs to make it easier and safer for people cycling to and from the CBD. With more people expected to use cars to get around, this $13 million investment will deliver pop-up lanes to help relieve congestion and provide an alternative to public transport for those living closer to the CBD.

'Works will be delivered in the coming months and provide a boost to our economy, creating and supporting over 40 local jobs.'

(See https://www.premier.vic.gov.au/safer-cycling-and-more-routes-keep-melbourne-moving)

Other reflections on the Victorian experience:

- Infection control has been a key variable. Without the resurgence of COVID, our informant commented, Melbourne might be like Perth or Brisbane, where there hasn't really been urgency or commitment to reform roads.
- Leadership: it was commented that many struggle with the complexity of the changes required, and may tend to fall back on the historical view point of transport as 'digging out of congestion'. Within the DoT, leadership has an important responsibility in shifting from a fire fighting view of the world to a more proactive and deliberate pandemic response.

6.4. Bogotá

6.4.1. Background

The Cycling and Walking Network is placed in the transport office of the City of Bogotá, but is also well-connected with the health authorities. This is seen as natural and necessary, given that road crashes are a serious issue in Colombia, as are acute respiratory infections related to crowding on transport, and lack of physical activity (83% of women are inactive, 70% of men).

The job of the Head of the Network is to articulate the work of different departments including those responsible for major roads, small roads, intersections and garbage disposal. All these things can cause problems for cyclists. The Network also communicates with relevant community groups (e.g. cyclist associations).

Bogotá is famous for its Ciclovia - about 170 km of open roads are closed on Sundays for pedestrian traffic and bikes. Logistics are managed by a Sports Institute, which has well-established protocols, and the equipment needed for traffic management e.g. lots of traffic cones. The Ciclovia began as a community initiative, then went to a referendum with the Mayor's support, and was passed by the city.

The Ciclovia means many people in Bogotá have bikes (it is estimated there are about 1.5 million in the city), know how to ride, and are familiar with major routes through the city, including those in the central part where offices and universities are clustered.

6.4.2. The COVID response

The main focus has been on provision of temporary bike lanes, building on the Ciclovia. The impetus for the COVID response came from seeing what was happening in other cities – e.g.

New York. At short notice, it was decided to do something similar in Bogotá ("one Sunday the office boss said – why not in Colombia?").

On 15 March 22 km of new bike lanes were created immediately, and another 170 km were in place shortly afterwards, activating the entire Ciclovia network. The Mayor was very supportive.

Although the city had a 'running start' with the Ciclovia set up, it was necessary to watch closely what happened when the temporary lanes were established, and to coordinate activities, e.g. traffic lights, buses.

What was the rationale for moving so quickly? Bogotá includes 8 million people, of whom about 1 million live in densely settled parts of the city. Buses are the most commonly used form of public transport – the rapid bus transit system is one of the most extensive in the world. Although there were only a few cases of COVID in March, people were very anxious about the risk of infection, both on board the buses, and around the bus stations, which can be extremely crowded. There was not a written plan initially, but one was prepared eventually to make the Ciclovia permanent.

Resources were available for a rapid response – painting of the roads was done by contractors, working closely with Road Maintenance for equipment and sharing materials with another city close to Bogotá. It was possible to muster about 600 people to work on the transport response to COVID.

Other changes apart from bike lanes: the Mayor has moved starting times for work to spread travel across the day (e.g. start times may be anywhere between 6 am and 10 am). There are new routes for access to healthcare facilities. As an experiment, 400 bikes have been provided for doctors and nurses. Also, street art and other aspects of tactical urbanism are being applied.

6.4.3. What worked well

There was constant evaluation followed by rapid reponse where there were problems. The new cycle lanes not only reduced vehicle traffic, but in some streets there was also a marked reduction in traffic speeds. Communications and messaging worked, largely because it was all routed through the Mayor's office. She fronted the COVID response, and 'everyone took notice'. When she said 'this is our project' everyone in transport worked on it. She is engaged, constantly checking that it is working, is very keen not to see 'a dead project'.The fact that other cities were doing similar things – that also added to people's confidence.

6.4.4. What has not worked so well

Maintaining the measures was not so easy. Looking after the equipment ('the elements' of the street changes) was a challenge, especially as businesses began to re-open. Traffic cones and other separators began to vanish, at night especially, and it was risky for transport staff (because of personal safety concerns) to be working at night and very early in the morning. It was decided not to prosecute or pressure people to put the barriers back. There was a surge of bike robberies, including some deaths.

6.4.5. Long-term

The community response was initially very positive: according to surveys, 80-90% of people in the city supported what was being done. When the bike lanes turned into permanent amenities then conflicts arose as car drivers had to change their routines. Also some cyclists were unhappy because cones had been moved or stolen, which meant the lanes felt quite unsafe.

The safety issues are important – there are many arterial roads on which trucks travel to and from Bogotá, which are crowded, high-speed and feel very unsafe for cyclists. The city is responding by putting in hard barriers to provide permanent physical separation. The work on these is disruptive in the short-term.

Roughly half the streets originally closed to traffic have re-opened: about 76 km are retained at present (early September). It is expected at this stage that 60-70 km will be permanent with barriers and physical separation. A few sections will need heavy interventions (e.g. purpose built bridges).

6.5. Other international responses

Insights from Oakland, California

These insights are primarily based on a webinar by Ryan Russo, Director, Oakland Department of Transport.

The City of Oakland (California) launched Phase 1 of their COVID-19 response in April. Seventy-four miles of *Slow Streets* were announced, where streets would be closed to through-traffic (with a focus on residential streets that were not bus routes, main streets, or through-routes). A similar concept was already a layer of the 2019 Bike Plan, recently adopted by local government with public consultation. To date (as of October 2020), 21 miles of Slow Streets have been implemented, using a staggered roll-out of approximately 6 miles a week.

The rationale was to enable physical distancing across the city, where high demand for space to walk, jog, and bike was creating public health risks. They also aimed to ensure safety and accessibility for emergency workers, ambulances, and essential workers, make sure the solution didn't make it harder for people to access essential services, and manage the increase in vehicle speeds seen during lockdown phases. Oakland often closes streets for parades, block parties, and Ciclovias – interventions aimed at bringing people together – so they were careful that the solution did not inadvertently encourage crowding or create an 'attractive nuisance'. This was a factor in the decision to focus on residential streets, rather than main recreation areas.

Key features of the intervention and process

- To create *Slow Streets,* they used barriers and signs at residential street intersections, marked with spray paint and chalk.
- They had support from volunteers and advocacy groups to distribute flyers, replace barriers, and identify user issues. There were also weekly meetings with advocates to gather ideas for further streets and eliminate ones that were no longer relevant.
- There was an iteration process to enable adaptation of the interventions overtime.
- Channels for formal input and a community online survey were developed.
- They worked closely with the public health department to develop the solution.
- They used parking technicians to support maintenance of the interventions.
- There was no focus on police enforcement - they felt it should be an intuitive and obvious intervention, rather than something that needed to be enforced.
- They started to focus more on community input and conversations as time went on.
- They aim to be transparent about the level of community support for *Slow Streets* and who is benefitting from their implementation. For example, community survey results published on their website show how Slow Streets are primarily being used by middle-class families.

Insights and Learning

- Overall, the response is seen as positive, with good compliance with physical distancing and low speeds.
- The media grabbed on to the term 'closure' even though the streets were not officially closed (deliveries, garbage collection, resident traffic still allowed).

- A big lesson learned is that even in an emergency crucial engagement steps are needed, especially in under-privileged communities, otherwise it can perpetuate the view of 'doing to' communities. It was felt that even if the development is happening rapidly it is essential to make crucial phone calls and have focused conversations.
- The existing thinking, analysis, and engagement around the 2019 Bike Plan enabled a more rapid response. However, this also created distrust in some instances where what was implemented in the COVID-19 response was different to what was originally discussed with communities.

Oakland describes how being nimble is important, and part of this is a willingness to take risks. They described the need for organisational courage, and a willingness to own the decisions, the outcomes, and the consequences. Leadership from the mayor and other departments, including leaders who were willing to take risks, was seen as an extremely important ingredient of their response.

The process of iterating and design adjustment was seen as significantly important, and part of this was being humble and listening without becoming defensive. There were concerns about the process in underserved communities who felt that 'Slow Streets' didn't necessarily meet their needs. For example, increased speeding on main roads, which made it harder to cross, was a more proximal concern. As a result, Oakland launched Phase 2 in May 2020 - Slow Streets: Essential Places. This involved installing intersection improvements to support residents' safe access to essential services (e.g. grocery stores, and COVID-19 test sites). The selected sites aligned with the City's High Injury Network and high priority neighbourhoods based on equity indicators, such as race and income (Oakland Department of Transportation, 2020)

Moving forward Oakland is trying to anticipate how things might change and how the approach needs to adapt to the reality over time (i.e. as the economy opens up), rather than simply planning to make all Slow Streets permanent.

In Oakland, Slow Streets are described as reinvigorating conversations about streets and how they are used, and it is felt that this outcome could be more important than the actual intervention, whereas traditionally, it has been hard to get people to engage with these concepts through standard engagement activities, such as public meetings.

Russo, R (2020). Webinar: 'Oakland's 75 Miles of Slow Streets: Mobility Experiments During Lockdown' April 2020. Published by the Urban Cycling Institute https://www.youtube.com/watch?v=NLGMIBHEVzg

Oakland Department of Transportation (2020). Oakland Slow Streets. Interim Findings Report September, 2020. https://cao-94612.s3.amazonaws.com/documents/Oakland-Slow-Streets-Interim-Findings-Report.pdf

Insights from Paris, France

These insights are primarily based on a webinar by Christophe Najdovski, the Deputy Mayor of Paris in June 2020.

Paris has been working on a shift towards mass public transit systems, active mobility (walking and cycling), and shared mobility since approximately 2014. In a city traditionally designed for vehicles (e.g. there were 8-10 lanes of traffic on Avenue des Champs- Élysées) air pollution levels above European Union requirements were a key driver for this shift. Prior to COVID-19, more than 1000km of bike infrastructure had been implemented, including three continuous safe paths across the whole city created by removing car lanes. The banks of the River Seine were also pedestrianised.

COVID-19 Response

In response to COVID-19, cycling associations (rather than the local authorities initially) worked on plans to copy the train network – 'RER V' – proposing more than 600km of bike lanes alongside train lines so people could bike (or wheel) to key destinations instead of catching the train.

City authorities were keen to reduce car use and relieve congestion on public transport, as there were concerns that people would take private cars in place of public transport contributing to congestion and backwards steps in air quality.

A cycling plan was developed, working with elected members, neighbouring banlieues ('cities'), and cycling associations. The plan was based on the existing cycling network, public transport attendance levels, difficult spots (identified by users), and the proposals from cycling associations. Part of the goal was to encourage 'new' cyclists on the network, which emphasised a need for safety and continuity.

In May and June 2020 cycling roads were created along the three most crowded metro lines and another 50km of pop-up bike lanes were planned to complete the network:

- The bike lanes were wide and separated from traffic (created using concrete blocks or large plastic bollards and by moving car parking out into a traffic lane).
- In some cases, traffic was removed in one direction and allowing only taxis, buses, and delivery vehicles.
- Yellow paint was used to indicate temporary changes, which was an existing convention.

There are 60 bike counters around the city and an open data site where daily data can be accessed. Monitoring data suggests a tenfold increase in cyclists along Rue de Rivoli compared to 3-years ago, with shifts from 1,500 to 15,000 cyclists. Overall cycling is estimated to be 30-50% higher than pre-quarantine levels (excluding Dec/Jan when there were public transport strikes), which is thought to mostly reflect an increase in bike commuter trips. Mode share estimates indicate a 70% drop in public transport use and car traffic has recovered to around 100% of pre-COVID levels. There has also been a huge increase in bike sales, suggesting high social demand. Paris now has 'cycling traffic jams', with is seen as both an unexpected outcome and new problem to resolve.

Reflections and learning

Three main factors were seen as enabling this shift towards cycling:

- A 'cultural victory' - cycling is no longer seen as a political marker of the 'left' or 'right'.
- A strong national commitment coupled with an easing of urban rules.

- The strong role and contribution of cycling associations, whose almost ready-to-use plans, made it easier to implement changes quickly.

Other important insights are below:

- The importance of conviction – there will always be conflicts when it comes to reallocating road space. The changes in Paris were not without controversy, for example the city went to court over the pedestrianisation of the banks of the Seine in 2016, but overtime widespread support for bike lanes and pedestrianisation has grown and this is described as a 'cultural victory'.
- It is critical to have support at a national level, with all levels of governance working together. This means the response can be faster and overcomes push-back.
- They recognised that meaningful increases in cyclists will not be seen until a full network is in place, and felt it is best to start with the easiest/least controversial sections, then grow the network step-by-step.
- Initially, bike lanes were installed as a temporary measure, however now people are asking for them to be made permanent. It is estimated that 90% of the bike lanes will be kept and there are plans to work through a process of network assessments where the lanes will be adapted or removed if they are not working well.
- They acknowledged difficulties with engagement during lockdown phases, and that communication was less than optimal. There were some concerns from local residents about lack of consultation and information, but this was relatively small overall.
- Bike parking remains a central issue and is seen as necessary for good cycling policy. There are plans to implement 100,000 new parks for bikes in railway stations, buildings, and on streets, working with several institutions. They have also made it mandatory for new buildings to have cycle parking available, whereas car parking is no longer mandatory.

Najdovski, C (2020). Tactical urbanism in Paris: Cycling policies in times of COVID-19, June 18/19 2020. https://sydney.org.au/committee-for-sydney-live-event/webinars/delivering-650-kms-of-cycleways-in-a-month-with-paris-deputy-mayor-for-transportation/

7. DISCUSSION

7.1. What changes were made?

There were common features to the street changes, locally and internationally. Wider footpaths, pop-up bike lanes, speed reductions, wider and easier pedestrian crossings, these featured in all the responses to COVID. There were differences also. Free parking was introduced in some New Zealand cities, to accommodate those who did not want to use public transport but still needed to travel. By contrast, in London and Bogotá, authorities took steps to actively discourage car use, including congestion charging and street closures. The use of footpaths and street space to accommodate business activity was at the centre of COVID responses in some places (e.g. London, Melbourne), but was not so prominent in New Zealand.

While there was strong support in New Zealand centres for transport changes to support public health action, the emphasis differed depending on local circumstances. In Wellington, a prominent concern was overload of public transport; in Dunedin support for city centre businesses was front of mind; and in Auckland, they aimed to support physical distancing for pedestrians and cyclists while maintaining a network focus and were also conscious of the need to support construction activities.

7.2. Aspects of the overseas experience that might be relevant in New Zealand

Community groups such as cycling associations were drawn into the COVID response in helpful ways in several cities. In Bogotá, the Cycling and Walking Network for the city not only connects all departments whose work is relevant to active transport, and reports directly to the Mayor of the city, but is also responsible for communications with community groups. In Paris, cycling associations worked with local authorities on route choices, path design, and identifying and fixing trouble spots. One reason the French associations were helpful was that they had 'almost ready to use' plans for improving safe routes. In Oakland, volunteers and advocacy groups helped to distribute flyers, re-instate barriers, and identify user issues. In New Zealand, co-design is regarded as an important principle, but there is no consistent approach to making best use of the knowledge and expertise of user groups.

To make attractive options for travel across the city, and therefore enable reduced public transport capacity and safer public transport use, pop-up bike routes mirrored existing transport networks. In Paris, the cycling roads ran alongside major metro routes; in Bogotá the bike routes were parallel to major highways; and in London the COVID routes built on the existing bike 'super-highways'. In Melbourne, some of the new bike lanes run parallel to arterial roads leading into the city centre, and, it was estimated, could potentially replace 20-30,000 car trips morning and night. In contrast, in New Zealand, aside from in Wellington, street space reallocation interventions as a mobility solution to lower public transport capacity was not a prominent rationale.

Conflicts occur everywhere there is change, we learnt from our interviews and reading the literature, but responses vary. In some instances, it was apparent that determined action was required (for example, in response to pressure from taxi operators in London who were

concerned about street closures). "Try it and see" was a successful approach in many instances. For example, in Paris pop-up bike lanes were installed on the provision they were temporary. Public support grew with experience of the lanes, and it appears that about 90% of the lanes will be kept long-term.

Internationally, changes were made most quickly in communities that were already favourably disposed to make more road space available for slow speed travel (e.g. inner-city councils in London, Sydney and Melbourne). Those we interviewed acknowledged that the areas in which change was easiest weren't necessarily the areas in which the needs for healthy, safe roads were the greatest. In low density, outer city areas, often the places were social disadvantage is most marked, street changes were not seen as a high priority. In Oakland, the initial Slow Streets solution was mostly benefitting middle-class families, and they quickly adapted their plan to focus more on the needs of lower income communities. In London, there was long-standing resistance from some road users and Councils to increasing space for cyclists, lowering speeds, and street closures for social activities like markets.

The Greater London Authority and Borough Councils used experimental orders to make changes quickly and allow people to respond after they have experienced the new arrangement. The GLA also ensured there were prompt, sensitive monitoring systems in place, so that when problems arose they were recognised, and could be rectified quickly. Our London informant commented that this quick turnaround when there were glitches (as there were bound to be, given the speed of roll-out) was important in gaining and holding confidence. He suggested reactions to street changes often followed a 'grief curve', with initial crowding and confusion, anger, then adaptation, new routines, and eventually, for many, it was possible to actually enjoy the new environment. While quick adaptation and refinement was not a widespread part of New Zealand's response, adapting the interventions on Queen Street and Tāmaki Drive in response to community feedback was considered a successful part of Auckland's response.

It is notable also the growth in technical guides to planning, design and operation of safe streets that has occurred. Examples include the publication by TfNSW (2020) of the ***New South Wales Street Treatments for COVID Recovery*** and, in the US, the ***NACTO guide to transport planning during pandemics*** (NACTO, 2020).

7.3. What was seen as 'success'

Collaboration and buy-in within organisations, the ability to move quickly once an emergency was declared, and making use of emergency processes (e.g. emergency speed limit rule), with few precedents to draw on, were all identified as successes in the New Zealand response.

How well street changes were used by pedestrians and cyclists was seen in many places as an indicator of effectiveness. In Wellington, walking and cycling lanes were proposed but not implemented, partly because it was perceived there was insufficient demand, with fewer people out and about than anticipated. In Auckland, the large numbers of pedestrians and cyclists on Tāmaki Drive using the expanded active mode lane during Alert Level 3 was interpreted as good reason to maintain the facilities, but not when numbers were down in the second lockdown.

At the temporary street space intervention sites where low usage was observed, there may be other reasons than lack of demand or lack of need. For instance, poor design and lack of maintenance may deter users, and these may have been factors on Ponsonby Road, Oteha Valley Road and Tāmaki Drive in Auckland (see photos in section 3.1). It is also clear that within

most interventions there were elements of 'success' and 'non-success', and therefore the ability (and time) to adapt and refine is important.

With some exceptions, New Zealand interventions were primarily focused on responding to demand rather than shaping or enabling mobility and supporting social inclusion in line with Alert Level requirements. The global importance of public health action was widely acknowledged, but at the level of particular interventions, responding where there was no demand (or more precisely, no expressed demand, as captured by numbers on the street) was framed as an unsuccessful response. People isolating themselves and not making essential trips due to fear of contagion was not really acknowledged as a problem or a rationale for street space reallocation. Instead, the public staying home was mostly viewed as a positive for the transport sector and the overall public health response. Likewise, there were fears that loss of carparks would place stress on struggling businesses. In contrast to overseas examples, strong arguments were not made for how easy and safe access for pedestrians, cyclists and street commerce can support the economy – while the intention was there in Dunedin, this was reportedly compromised by the quality and scale of the intervention.

Possible reasons for the focus on 'demand-led' interventions might include perceptions of public responses (for example, empty bike paths might invite strong pushback and not be seen as credible investments) or measurement difficulties, such as uncertainty about how to evaluate responses to COVID in the New Zealand setting. The 'predict and provide' approach to design of roads prevails in most transport planning in New Zealand and appears to have flowed through into the pandemic response. This may be a function of the data that are available: there are systems in place in all cities to monitor traffic counts (though non-permanent monitors were removed during lockdowns), and often pedestrian and cycle counts too, but no measures ready to hand for tracking changes over time in physical distancing or other aspects of infection control and community well-being. Resistance to street changes within transport agencies on the basis that traffic flows were the prime metric of performance was also noted as a barrier overseas Often what was required to overcome this was direction from CEO level (backed up by political leaders) to enable substantial and sustained changes on health grounds.

Some of the New Zealand informants pointed to the very small number of COVID cases that were attributed to contacts on public transport or in the street as evidence that the actions that were taken were successful. However, the number of cases is not a good measure of success when the incidence of COVID is very low, as it was in New Zealand outside managed quarantine and isolation facilities. The shape of the epidemic curve lends support to the March 2020 move to Alert Level 4, which was followed shortly by a steep reduction in daily numbers of cases. But more fine-grained interventions (the use of face masking for instance, or changes in the transport system) are difficult to justify solely on the basis of case numbers.

7.4. Challenges

Both fears of public backlash and actual negative public reactions appear to have affected the COVID-19 response in all three regions in New Zealand, but in slightly different ways: in Dunedin it contributed to a compromised and confusing solution; in Auckland, the removal of interventions; and in Wellington, reduced political support to follow through and implement the interventions during Level 2 and 3. The lack of time to engage properly, which may have mitigated some of these concerns, was seen as a barrier to an effective and well-accepted response.

The international case studies presented a slightly different picture. In these instances, the public health crisis was the reason for action, and street changes were an element of the

emergency response. City leaders and the heads of transport departments provided the mandate; emergency regulations empowered agencies to act. Close engagement with all affected (including commercial operators, user groups such as cycling and walking associations, community and business interests and local politicians) was important to learn from the street changes, to deal with problems that arose, and make improvements where possible.

A key learning for Oakland was that community engagement or 'crucial conversations' are important, especially with vulnerable communities, and after initially responding very rapidly they built in engagement steps. From the interviews, it appears that the prominent barriers in New Zealand were mostly operational (decision-making, leadership, planning, engagement) rather than legal or regulatory. Current provisions for emergency measures did enable the interventions to be implemented, even if there were some challenges, such as the reliance on orange cones through the TMP process, which impacted the quality of the intervention. However, whether or not current legal/regulatory provisions allow for these temporary interventions to progress to more permanent installations was largely untested, with the exception of Queen Street.

It also appeared to be the case that local government was not confident it had the mandate to act without support from local constituencies such as local boards, elected members and business associations. This was particularly the case with street changes. Other interventions could proceed rapidly because there was cover provided by legislation (the Health and Safety at Work Act for instance) or by express requirements in the pandemic response. For example, physical changes were made to the interior of buses to ensure that drivers were fully distanced from users, but no comparable physical interventions applied for users, either inside the vehicle or at bus stops. Similarly, without consultation, all passengers were required to swipe their transport card on entry and exit, although there were no fares payable, to assist in contact tracing.

How important was the fact that COVID was scarce in New Zealand, even at the height of the first 'wave' of infections, compared with the experience in most other countries? Did national success in controlling the disease make it more difficult to introduce street changes?

Some informants reported this was the case, that many people seemed to be unconvinced of the need for change. Arguments around low community transmission were also used to oppose street space interventions and to advance a 'pedestrianisation by stealth' framing. An example was the reaction of Ports of Auckland to the proposal to make changes on Tāmaki Drive that might impede truck movements. As noted already, the small number of instances in which infection was attributed to contacts on public transport raised questions about whether further changes were warranted.

The point of pandemic prevention is to act before infection is widespread, but the novelty of this disease, and the lack of experience in New Zealand in recent times of pandemics of any form, make it difficult to introduce changes that may be disruptive. We note that in some places overseas it was possible to move quickly on safe street initiatives even though COVID was scarce. Sydney is one example – in that city per capita COVID rates were initially similar to those in New Zealand. And in Bogotá, although COVID subsequently surged to levels much higher than New Zealand, in March 2020, when major transport changes were made, there had been only a few cases. But our interviews indicated the urgency of the pandemic certainly does play a part – for example, our informant from Victoria commented "without the resurgence of COVID, Melbourne might be like Brisbane or Perth where there hasn't really been urgency or commitment to change roads".

7.5. How do we foster a nimble, effective pandemic response?

A strong message from the interviews and the literature review is that it is much easier to move quickly and effectively in a pandemic if there is a plan to hand. This applies as much in transport as in public health. Examples overseas include Ciclovia in Bogotá (which was converted rapidly from one-day a week to seven-days, opening up about 150 km of city streets to safe active travel), the UK cycling strategy and the business case for cycling throughout Greater Sydney that had already been approved by Infrastructure NSW. In New Zealand, work had been planned for Queen Street in Auckland pre-COVID, and this paved the way for accelerated street changes. It may explain also why this intervention is the only one in Auckland that has been maintained.

To what extent would stronger guidance from central government be helpful? There were various views. Some of our informants said it would be useful to have a clear steer on the practicalities of street changes. As examples: footpath width, separators on pop-up bike lanes, outdoor space for business, street closures – what is required exactly on public health grounds, in each instance? At the same time, we formed the impression that changes, whatever they were, needed to be 'sold' locally. One of those we interviewed said that "ultimately it is the local dynamics, the local constituency, that matter".

We gathered from case studies overseas that it was helpful to link transport changes with the larger goal of economic recovery. For instance, the argument was made in London that more space for walking and cycling was needed to reduce the load on public transport, and that had to happen in order for essential workers who depended on buses and trains to travel safely. These workers were not just essential for the health response, but also for sustaining business and keeping the economy afloat. In Bogotá, it was not just the crowding on the rapid transit bus system that was seen as a major threat, but the crowding that occurred at bus stations. To ensure that business could continue, it was necessary to make changes rapidly to provide for safe travel across the city, and since private motor vehicles were not a satisfactory alternative for many reasons, there was strong support for a swift move to low traffic streets and safe space for cyclists.

Outdoor dining spaces in Melbourne were introduced to 'get people back into the city' according to our informant. What followed were speed limits and removal of parking where businesses needed to expand outdoors. Pop-up bike lanes complemented the revitalisation of streets in the city centre. Economic gains were regarded as paramount – health gains were considered important, but were secondary. "We couldn't have made these changes so quickly if it was just about bikes", we were told. In London it was predominantly the economic argument that led to Soho streets turning into pedestrian only routes so restaurants and pubs could set up outdoors, and in that way survive at a time when indoor gatherings were severely restricted.

The strong links between transport authorities and transport operators were clearly important to enable changes in response to COVID to be made rapidly and coherently. As cycling and walking are not commercial activities, there are no 'operators' comparable to those in the public transport sector for instance, which makes it more difficult for authorities to be aware of needs and experiences, and to draw on the expertise of user groups. The experience overseas, where community groups such as cycling associations have played a valuable part in street changes during the pandemic, suggests this might be an area for review.

We did not have time to explore closely the links between different Transport bodies, and the connections between those bodies and Health authorities, centrally (Ministry of Health) or locally (Regional Public Health Services). However, based on our discussions with central

government representatives, it seems that there were not strong messages from the Ministry of Health on the need for street space allocation, which likely meant it wasn't necessarily prioritised, and only occurred because of the nimble adaptation to the Innovating Streets fund. Clearly nimble and effective responses depend on common messaging and consistent objectives. It is important, for instance, to ensure the advice to the public at each Alert Level on walking and cycling is consistent and well-substantiated. There have been some messages that are unclear or seemingly discordant, e.g. on the use of masks while exercising, the acceptable distance that could be travelled by bike or on foot under Alert Level 4, and whether cycling at Alert Level 1 is encouraged.

7.6. A platform for change?

In all the interviews, we learnt authorities were aware that the pandemic was an opportunity to advance street changes that were desirable, in any event. The COVID response has developed learning, stimulated thinking, and in some cases created a platform for discussion and change. However, this may not happen in all cases and there is also the potential to go backwards or complicate this space further if the process and/or solution is ineffective.

Footpath extensions in Queen Street, Auckland were an example of sustained change. However, throughout New Zealand there was considerable difficulty in making full use of the opportunity, and very few street changes were retained once the COVID Alert Level returned to 1. Will the COVID response make it easier to introduce improvements in the future? This is not clear. There is some optimism (e.g. in Ponsonby Road in Auckland, where conversations have been started with local businesses, and 'may bear fruit') and proposals developed in Wellington during the pandemic are now progressing through another round of Innovating Streets. But others hinted that it may actually be more difficult now, with the COVID-19 interventions potentially making more stressful what have always been controversial street space interventions.

8. THE STREET SPACE FRAMEWORK

8.1. Proposed 'COVID-19 Transport Response - Street Space Framework'

In this section we propose a draft COVID-19 transport sector response framework for street space allocation and physical distancing measures (*referred to as 'the Framework'*). This Framework has been developed with the following principles and assumptions in mind:

- The Framework aims to a) reduce infection risk and b) promote community resilience (by maintaining access to essential goods and services, employment, physical activity, and social connection opportunities). Level 0 is when the COVID-19 pandemic is no longer a risk and focuses on building long-term resilience through diversifying transport options.
- There is very little differentiation between the interventions proposed at Level 1 and 2. While we acknowledge that at Level 1 physical distancing is not required in New Zealand's Alert Level guidance, there is minimal difference in infection risk at these two levels and it is likely to be difficult for councils to make frequent and high-quality changes to streets, with little or no warning of Alert Level changes.
- The absence of a 'tick' does not necessarily mean measures should **not** be in place (or that there are not wider benefits associated with these interventions), rather it means they are not critical for the COVID-19 response at this Alert Level.
- The Framework aims to outline what a 'best practice' approach looks like. However, not all measures will always be necessary, prioritisation will be needed, and there is a need to take the local context and needs of the community into account. Similarly, it is expected that local authorities will use this in combination with their own strategies and plans.
- We have developed this Framework using the literature and learning from overseas. New Zealand transport professionals have provided input, and their feedback has been incorporated; however, it is recommended that further consultation and input occurs.

Figure 3: Proposed 'COVID-19 Transport Response – Street Space Framework'

NZ COVID-19 Alert Levels		0	1	2	3	4
Strategy		**Ongoing pandemic and disruption resilience planning**	**Prepare** - the disease is contained in NZ	**Reduce** - the disease is contained, but the risk of community transmission remains	**Restrict** - high risk the disease is not contained	**Lockdown** - likely the disease is not contained
Risk Assessment			• COVID-19 is uncontrolled overseas • Sporadic imported cases • Isolated local transmission could be occurring in NZ	• Limited community transmission could be occurring • Active clusters in more than one region	• Multiple cases of community transmission occurring • Multiple active clusters in multiple regions	• Sustained and intensive community transmission is occurring • Widespread outbreaks
TRANSPORT SECTOR RESPONSES	**Provide footpaths along all residential roads**	✓	✓	✓	✓	✓
	Provide safe cycling facilities along key transport routes	✓	✓	✓	✓	✓
	Increase footpath widths along high streets and in town centres		✓	✓	✓	✓
	Maintain walking and cycling access around the outside of managed isolation facilities		✓	✓	✓	✓
	Install physical distancing signage or markings along busy footpaths and at popular recreational spots		✓	✓	✓	✓
	Promote outdoor dining *off footpaths* (cut permit costs and application requirements, allow dining in parking spaces, reduce speeds outside cafes and restaurants)		✓	✓		

	Automate pedestrian signals and reduce wait times along high streets and in town centres		✓	✓	✓	✓
	Increase pedestrian waiting space at busy bus stops		✓	✓	✓	✓
	Reduce speeds in residential areas and around supermarkets				✓	✓
	Increase pedestrian waiting space outside chemists, supermarkets, and busy takeaway businesses				✓	✓
	Increase walking and cycling space to and at popular recreational spots				✓	✓
	Reduce vehicle traffic at parks and outdoor recreation areas				✓	✓
	Facilitate local street closures				✓	✓

8.2. Stakeholder feedback

Eleven council and central government stakeholders were invited to provide feedback on an earlier version of the proposed COVID-19 Transport Response - Street Space Framework. Feedback was received from five stakeholders and the main points are summarised here.

8.2.1. Building a mandate for street space reallocation

Respondents were generally in favour of the way the Framework was presented – people said the format was familiar, the framework was legible, and it was helpful when specific actions were linked to the Alert Level system.

Should the Framework provide 'direction' or 'guidance'? Some argued for 'guidance', on the grounds that local circumstances (e.g. funding) might make it difficult to implement street changes in every location. However, others thought national-level direction was needed to ensure that when changes were made, they were best-practice, and to assure local government there was firm backing for street changes. The impact of the framework might be limited if it was only in the form of guidance.

"It all helps to shift the tide"

"Having that… backing at a national level to then go and do some of these things would definitely be useful"

"Without a really strong mandate for change, things can be very challenging"

8.2.2. Provision for dual goals of infection control and community resilience

Respondents emphasised the importance of resilience, which applies not just to pandemics but to recovery after other disruptions such as earthquakes. At present, it was observed, the infection control element is prominent in the framework, but there are other benefits of street changes that also deserve attention. These include enabling people to be as close together as possible to enable social connection, while keeping safe.

The Alert Level framing is helpful in many ways, but should not discourage councils from being pro-active, from taking steps necessary to foster resilience long-term, regardless of and beyond COVID-19.

It would be helpful, some observed, to include explanatory text alongside the Framework. This might lay out underlying principles or explain the rationale in narrative form.

It was not clear whether measures are intended to be removed or remain in place when moving down levels (rather than up).

"My experience was that we didn't really need to intervene [during the higher Alert Level lockdown], it was worked out at that local level quite well"

Some felt the Framework was not so helpful at high Alert Levels, when traffic volumes are low in any so communities could implement their own measures (e.g. walking on the road). Others pointed to the tendency for average speeds to rise as roads emptied, so that some controls were necessary still.

Is the Framework too simple? It might be necessary, suggested one respondent, to include intermediate Alert Levels/changes e.g. '2.5'.

8.2.3. Feasibility and appropriateness of the proposed responses

More detail would be helpful, said some. For instance, more specific direction would be helpful on recommended footpath widths and how to best cater to cycling. Others commented that appropriateness and feasibility should be determined on a case by case basis.

Funding and time would be significant barriers to implementing all the responses, we were told. The fact that Innovating Streets money was available during the first lockdown was accidental, but also very helpful.

Occupational health and safety issues might affect feasibility. It was pointed out that at Alert Level 4, non-essential workers stay home, and in the first lockdown this included many council staff and workers.

Community support was described as necessary for street space reallocation responses – the fact that people 'reclaimed the streets' during first lockdown helped make the case for re-allocating space in later stages of the pandemic response.

"A toolkit would provide some sort of certainty around what those costs might be"

"Anything to do with road space allocation is going to be politically challenging to say the least… it's not about technical feasibility, it's a question of funding obviously, but also that challenge when people are already dealing with a lot of change"

8.2.4. Essential responses

These actions were given highest priority by respondents:

- Increasing walking and cycling space in general (the first two columns) as well as to and at popular recreational areas e.g. Tāmaki Drive in Auckland
- Providing pedestrian space and physical distancing signage outside chemists and supermarkets
- Automating pedestrian signals
- Ensuring cycling access, especially at higher Alert Levels, to provide a healthy alternative to public transport

Lower priority but still important were: promoting outdoor dining off footpaths, reduced speed in residential areas, facilitating local street closures, and reducing traffic at parks.

8.2.5. Suggested additional responses

Aside from reducing speeds in residential areas at all Alert Levels, which was felt unlikely to be feasible for councils to implement (but could be used as an efficient alternative to increasing footpath widths and cycling facilities should councils prefer), all the following amendments were incorporated into the final proposed Framework:

- Provide pedestrian space and physical distancing signage at popular eating/takeaway locations and shops at level 3, past fenced off isolation hotels, and at busy bus stops (in addition to outside chemists and supermarkets)
- Automate pedestrian signals from Levels 1-4

- Reduce speeds around supermarkets and shopping centres
- Reduce speeds in residential areas should be ticked at all levels as it increases pedestrian space
- The cycling intervention should be reworded as "provide *safe, separated cycling infrastructure* along key transport routes".

8.2.6. Identifying and prioritising locations for intervention

It was pointed out that local discretion will be necessary in putting the framework into practice. For instance, cities may have many high streets/town centres, and judgements will need to be made about which areas are treated first.

8.2.7. Alignment with broader transport plans and strategies

It was clear in the feedback that the Framework must be consistent with other high-level Transport documents, such as the Transport Outcomes Framework, and possibly the Road to Zero strategy. The Framework must articulate with Network Operating Plans at local government level. It needs to line up with existing transport goals to encourage walking and cycling and create better city streetscapes. Alert level 0 responses should be consistent with business-as-usual best practice.

There must be a strong rationale accompanying the Framework, so that readers understand the importance of catering to walking and cycling during pandemics and other disruptions. For instance, the case must be made persuasively that limits on public transport capacity mean people require safe and healthy alternative transport options.

The Framework should refer to technical information on what is required for safe, high quality infrastructure (but not include this detail, which takes up a good deal of space, and frequently requires updating).

In advance of outbreaks, we were told, Councils should be able to identify strategic routes, and should prepare a generic Traffic Management Plan that is ready to roll-out (with tweaks).

8.2.8. Overcoming implementation barriers

To be helpful in overcoming barriers, the Framework or its accompanying documentation should identify priority areas and emphasise quality over quantity, we were told. In its present form, the Framework is useful for identifying possible interventions but does not clearly outline the why and the how to implement them. We should make every effort to learn from the present Innovating Streets projects, about how to respond quickly and how to do better than cones alone.

It was pointed out that present regulations such as the Code of practice for temporary traffic management (CopTTM) may not help, and may even hinder the pandemic response, but there is no mention of this in the Framework. Staff were concerned also that the present framing of emergency laws means measures taken in the acute pandemic response must be reversed at lower Alert Levels.

It would be helpful to minimise the number of transitions that Council staff have to negotiate. This may mean recommending responses that stretch across multiple Alert Levels (e.g. automated pedestrian signals at level 1 and above) to reduce the financial and time burden that applies when making changes at each Alert Level.

9. RECOMMENDATIONS

1. **Build on what has worked well.** There were examples of positive street use responses to COVID in a number of regions. We can learn from the adaptability, improvisation, and leadership that underpinned these responses to complement a suitable national response.

2. **Tell the "why?" story better.** In a similar way to the COVID app and mask use, many people don't understand why physical distancing is needed when COVID isn't in their local community.

   Key principles include:

   f) a strong narrative consistent with government messaging on COVID (e.g. 'creating more space to keep everyone safe and healthy', and 'we are level 1 not level none')
   g) priority goes to protecting those who are most vulnerable
   h) streets are important assets for physical distancing and community resilience
   i) the purpose of pandemic prevention is to act before infection is widespread
   j) guidance for local government on how public engagement should proceed when street changes are made.

3. **Develop a nationally agreed way of working on safe streets as part of the pandemic response.**

   Focus on national direction and enabling local government responsiveness:

   d) a high-level nationally agreed framework on what changes are required and when (see Section 8.1), with an accompanying narrative including suggestions for prioritisation
   e) local government plans that respond to the national framework and utilise existing mechanisms, such as Network Operating Plans
   f) local government support for rolling out the plan utilising a nationally-led emergency response fund, design guidance, insurance etc.

4. **Review the regulations to enable rapid street change and make changes where necessary** – An effective pandemic response requires fit for purpose regulatory mechanisms to empower local government to implement high-quality street space modifications, and to keep them beyond acute pandemic outbreaks if the changes fit strategic transport priorities.

5. **Improve the cross-Ministry response on street space.** Central government has worked hard to coordinate COVID response efforts. Now include coordinated understanding of the need for street space modification as part of the COVID response:

   c) engage with Ministry of Health on street changes for physical distancing and resilience
   d) ensure the messaging on active transport and street space reallocation during a pandemic is consistent through the lines of command.

6. **Develop suitable measures of success for a pandemic response that form the basis of evaluation, monitoring and continuous improvement, including:**

   c) process measures to further understand and overcome barriers to effective rollout
   d) outcome measures that fit the objectives of the pandemic response, such as the usability of street modifications, evidence of physical distancing, uptake of walking and cycling, amount of physical activity.

7. **Formally include cycling and walking advocacy groups in the emergency response.** This has worked well overseas, and advocacy groups have worked well with local government on other walking and cycling projects. They can help facilitate street reorientation.

10. REFERENCES

Appleyard, B. (2017). The meaning of liveable streets to schoolchildren: An image mapping study of the effects of traffic on children's cognitive development of spatial knowledge. Journal of Transport & Health, 5, 27-41.

Auckland Transport (2020). Monthly cycle monitoring. https://at.govt.nz/cycling-walking/research-monitoring/monthly-cycle-monitoring/#:~:text=March%202020%20automatic%20cycle%20counts,decrease%20compared%20to%20March%202019. Accessed 27 October 2020.

Baker, SP., Haddon, W. (1974). Reducing injuries and their results: the scientific approach. Milbank Memorial Fund Quarterly, 52, 377-389

Bike Auckland (2020). The Big Backyard Bike Count report – local revolutions in lockdown! June 17, 2020. https://www.bikeauckland.org.nz/the-big-backyard-bike-count-report-local-revolutions-in-lockdown. Accessed 3 November 2020.

Cava, M. A., Fay, K. E., Beanlands, H. J., McCay, E. A., & Wignall, R. (2005). The Experience of Quarantine for Individuals Affected by SARS in Toronto. Public Health Nursing, 22(5), 398-406.

Douglas, M., Katikireddi, S. V., Taulbut, M., McKee, M., & McCartney, G. (2020). Mitigating the wider health effects of covid-19 pandemic response. BMJ, 369, m1557.

Dunton, G.F, Do, B & Wang, S.D (2020). Early effects of the COVID-19 pandemic on physical activity and sedentary behavior in children living in the U.S. BMC Public Health 20, 1351. https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-020-09429-3

European Cyclists' Federation (2020). COVID-19 Cycling Measures Tracker. https://ecf.com/dashboard. Accessed 27 October 2020

Every-Palmer, S., Jenkins, M., Gendall, P., Hoek, J., Beaglehole, B., Bell, C., . . . Stanley, J. (2020). Psychological distress, anxiety, family violence, suicidality, and wellbeing in New Zealand during the COVID-19 lockdown: A cross-sectional study. PLoS ONE, 15(11), e0241658.

Farmer, C., Lund, A. (2006) Trends over time in the risk of driver death: what if vehicle designs had not improved? Traffic Injury Prevention,7(4), 335-342.

Freeman, D., Waite, F., Rosebrock, L., Petit, A., Causier, C., East, A., . . . Lambe, S. (2020). Coronavirus conspiracy beliefs, mistrust, and compliance with government guidelines in England. Psychological Medicine, 1-13.

Gatersleben, B., Murtagh, N., & White, E. (2013). Hoody, goody or buddy? How travel mode affects social perceptions in urban neighbourhoods. Transportation Research Part F: Traffic Psychology and Behaviour, 21(Supplement C), 219-230.

Hisham, I. N., Townsend, G., Gillard, S., Debnath, B., & Sin, J. (2020). COVID-19: the perfect vector for a mental health epidemic. BJPsych Bulletin, 1-7.

International Transport Forum (2020). COVID-19 Transport Brief. Re-spacing our cities for resilience, 3 May 2020. https://www.itf-oecd.org/sites/default/files/respacing-cities-resilience-covid-19.pdf

Jackson-Morris, A. M., Nugent, R., Ralston, J., Barata Cavalcante, O., & Wilding, J. (2020). Strengthening resistance to the COVID-19 pandemic and fostering future resilience requires concerted action on obesity. Global Health Action, 13(1)

Jefferies, S, French, N, Gilkison, C, Graham, G, Hope, V, Marshall, J, McElnay, C, McNeill, A, Muellner, P, Paine, S, Prasad, N, Scott, J, Sherwood, J, Yang, L, & Priest, P (2020). COVID-19 in New Zealand and the impact of the national response: a descriptive epidemiological study.' The Lancet. Public Health, vol. 0, no. 0, doi: 10.1016/S2468-2667(20)30225-5.

Killgore, W. D. S., Taylor, E. C., Cloonan, S. A., & Dailey, N. S. (2020). Psychological resilience during the COVID-19 lockdown. Psychiatry Research, 291, 113216.

Kissler, S. M., Tedijanto, C., Goldstein, E., Grad, Y. H., & Lipsitch, M. (2020). Projecting the transmission dynamics of SARS-CoV-2 through the postpandemic period. Science, 368(6493), 860.

Kyriazis, A., Mews, G., Belpaire, E., Aerts, J., & Malik, S. A. (2020). Physical distancing, children and urban health. Cities & Health, 1-6.

Lippi, G., Henry, B. M., & Sanchis-Gomar, F. (2020). Physical inactivity and cardiovascular disease at the time of coronavirus disease 2019 (COVID-19). European Journal of Preventive Cardiology, 27(9), 906-908.

Loneliness NZ. (2020). Prolonged loneliness in New Zealand before, during, and after lockdown. Auckland: Loneliness NZ.

Ma, R. C. W., & Holt, R. I. G. (2020). COVID-19 and diabetes. Diabetic Medicine, 37(5), 723-725.

Mindell, J. S., & Karlsen, S. (2012). Community severance and health: what do we actually know? Journal of Urban Health, 89(2), 232-246.

Ministry for the Environment. (2019). *Climate Change Response (Zero Carbon) Amendment Act 2019*. Accessed 11 November 2020. https://www.mfe.govt.nz/climate-change/zero-carbon-amendment-act

Ministry of Health (2020). COVID-19: Current cases, 26.10.2020. https://www.health.govt.nz/our-work/diseases-and-conditions/covid-19-novel-coronavirus/covid-19-data-and-statistics/covid-19-current-cases Accessed 26 October 2020.

Michie, S., & West, R. (2020). Behavioural, environmental, social, and systems interventions against covid-19. BMJ : British Medical Journal (Online), 370

NACTO (2020). Streets for Pandemic Response & Recovery. 21.05.2020 https://nacto.org/publication/streets-for-pandemic-response-recovery/. Accessed 3 November 2020

NZ Government (2019). Road to Zero: New Zealand's Road Safety Strategy 2020-2030. Wellington. https://www.transport.govt.nz/multi-modal/keystrategiesandplans/road-safety-strategy/

NZ Government (2020). Government Policy Statement on Land Transport 2021/22-30/31. Wellington. http://www.transport.govt.nz/area-of-interest/strategy-and-direction/government-policy-statement-on-land-transport-2021/

New Zealand Government (2020). New Zealand COVID-19 Alert Levels. Updated 20 August 2020

Puterman, E., Delongis, A., Lee-Baggley, D., & Greenglass, E. (2009). Coping and health behaviours in times of global health crises: Lessons from SARS and West Nile. Global Public Health, 4(1), 69-81.

Quinn R (2020). Spike in rheumatic fever cases in Wellington, 25 May 2020. Radio New Zealand. https://www.rnz.co.nz/news/national/417429/spike-in-rheumatic-fever-cases-in-wellington. Accessed 3 November 2020.

Reid C (2020). New Zealand First Country To Fund Pop-Up Bike Lanes, Widened Sidewalks During Lockdown. Forbes, 13 April 2020. https://www.forbes.com/sites/carltonreid/2020/04/13/new-zealand-first-country-to-fund-pop-up-bike-lanes-widened-sidewalks-during-lockdown/?sh=651e2a40546e. Accessed 4 November 2011

Reynolds, D. L., Garay, J. R., Deamond, S. L., Moran, M. K., Gold, W., & Styra, R. (2008). Understanding, Compliance and Psychological Impact of the SARS Quarantine Experience. Epidemiology and Infection, 136(7), 997-1007.

Rugg-Gun, A. J., Do, L. (2012) Effectiveness of water fluoridation in caries prevention. Community Dentistry and Oral Epidemiology 40(Suppl 2), 55-64

Strang, B (2020). Covid-19: Speeding fines, police pursuits increase during lockdown, 27 August 2020. Radio New Zealand. https://www.rnz.co.nz/news/national/424540/covid-19-speeding-fines-police-pursuits-increase-during-lockdown. Accessed 3 November 2020.

Thaker, J., & Menon, V. (2020). Aotearoa-New Zealand Public Responses to COVID-19. Palmerston North: Massey University.

Transport for New South Wales (2020). NSW Street Treatments for COVID Recovery, August 2020. *https://www.rms.nsw.gov.au/projects/01documents/popup-covid-19-infrastructure/nsw-street-treatments-for-covid-recovery.pdf*

Vancouver Public Space Network. (2020). Creating Open & Safe Streets in Vancouver. Working Draft – Position Paper v6. May 2020 Voxy (2020). New Covid research highlights impact on physical activity, 27 September 2020. http://www.voxy.co.nz/health/5/374140. Accessed 3 November 2020.

Waka Kotahi NZ Transport Agency. (2020a). Arataki. Our Plan for the Land Transport System 2021-31. Version 2. Accessed 12 November 2020. https://www.nzta.govt.nz/assets/planning-and-investment/arataki/docs/key-drivers-step-changes-levers-interventions-august-2020.pdf

Waka Kotahi NZ Transport Agency. (2020b). NZTA COVID-19 Transport Impact: Fieldwork Waves 1, 2 & 3 Weekly Core Report, 21st April 2020. Wellington: NZ Transport Agency.

Waka Kotahi NZ Transport Agency (2020c). Waka Kotahi COVID-19 transport impact. Fieldwork waves 1–21 core report 29 September 2020. Ipsos. https://www.nzta.govt.nz/assets/resources/covid-19-impacts-on-transport/waka-kotahi-nzta-covid-19-tracking-core-report-wave-21-20200929.pdf. Accessed 3 November 2020.

Walker, H. (2020). AloneTogether: The risks of loneliness in Aotearoa New Zealand following Covid-19 and how public policy can help. Auckland: The Helen Clark Foundation.

Wiki, J., Kingham, S., & Banwell, K. (2018). Re-working Appleyard in a low density environment: An exploration of the impacts of motorised traffic volume on street livability in Christchurch, New Zealand. World Transport Policy and Practice, 24, 60-68.

Wild, K. (2020). Life in a low-traffic neighbourhood. Auckland: Women in Urbanism Aotearoa.

World Wellbeing Panel. (2020). How to keep up wellbeing during the COVID-19 Pandemic: A Global Perspective Barcelona: Barcelona Graduate School of Economics.

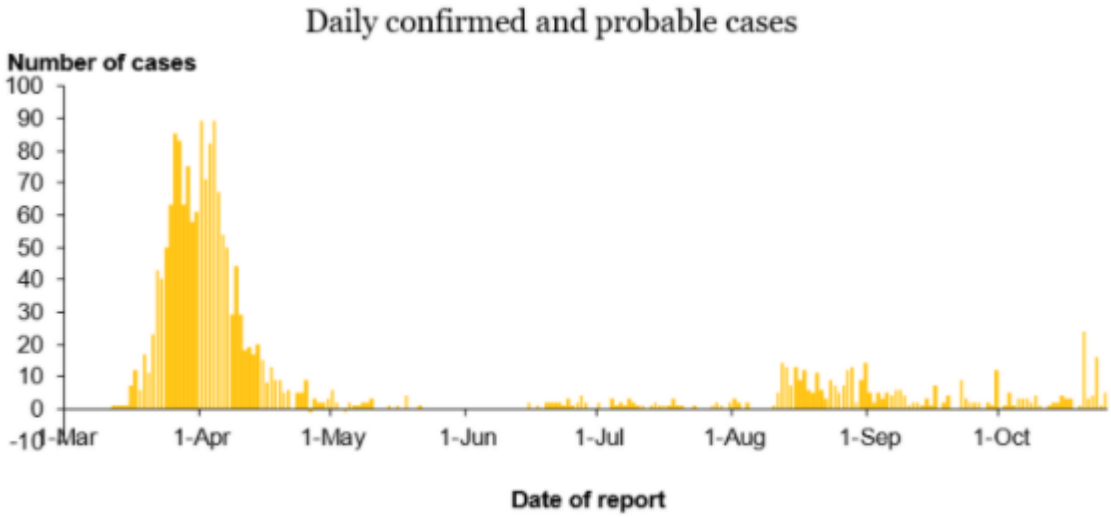
Wu, X., Nethery, R. C., Sabath, B. M., Braun, D., & Dominici, F. (2020). Exposure to air pollution and COVID-19 mortality in the United States: A nationwide cross-sectional study. medRxiv, 2020.2004.2005.20054502.

.

APPENDIX A: COVID-19 in New Zealand and mobility impacts

COVID-19 in New Zealand

As of October 26 2020, there have been 1,940 confirmed or probable COVID-19 cases in New Zealand and 25 deaths. There are 74 active cases, almost all of which are in managed isolation or quarantine facilities (Ministry of Health, 2020).



New confirmed and probable cases over time, as at 9.00 am, 26 October 2020

Source: Ministry of Health (2020)

New Zealand's first case was reported on 28th of February 2020, and in March, the New Zealand government implemented a four-tiered pandemic response aimed at suppressing transmission, with the goal of elimination. The public health and social measures specified at each Alert Level are outlined below, which were implemented alongside strategies such as contact-tracing, testing, and managed isolation at the border.

> Level 4 - stay at home, other than for essential personal movement and doing essential work, stay in immediate household bubble. Physical distancing requirement: 2 metres apart at all times outside home, including at workplaces.
>
> Level 3 - Stay at home, other than for essential personal movement, and going to work/school. Stay in extended bubble, which can now include close family or caregivers. Physical distancing requirement: 2 metres apart outside home where possible (apart from with those within their extended bubble) and 1 metre in a controlled environment such as a workplace,
>
> Level 2 - Businesses open, but physical distancing requirements apply. Gatherings limited to 100 people. Physical distancing requirement: 2 metres from people they don't know, in public and retail stores. Keep 1 metre in other environments like workplaces, gyms, libraries and cinemas where practicable.
>
> Level 1 - Border measures are in place. Public health measures in place, but no physical distancing requirement. Public health measures are guidance for everyone but are not a legal requirement. (NZ Government, 2020)

New Zealand's initial pandemic response is described as effective from an infection control perspective – it resulted in low relative burden of disease, low levels of population disease disparities, and the initial achievement of COVID-19 elimination (Jefferies et al., 2020). In the first wave, New Zealand had one of the lowest total case counts, incidence, and mortality among higher-income countries (Jefferies et al., 2020)

However, this was not the end of COVID-19 in Aotearoa, a second community outbreak occurred in August and September, causing a return to Level 3 in Auckland, and Level 2 for the rest of the country. New Zealand continues to see a number of cases at the border (Ministry of Health, 2020), including sea borders.

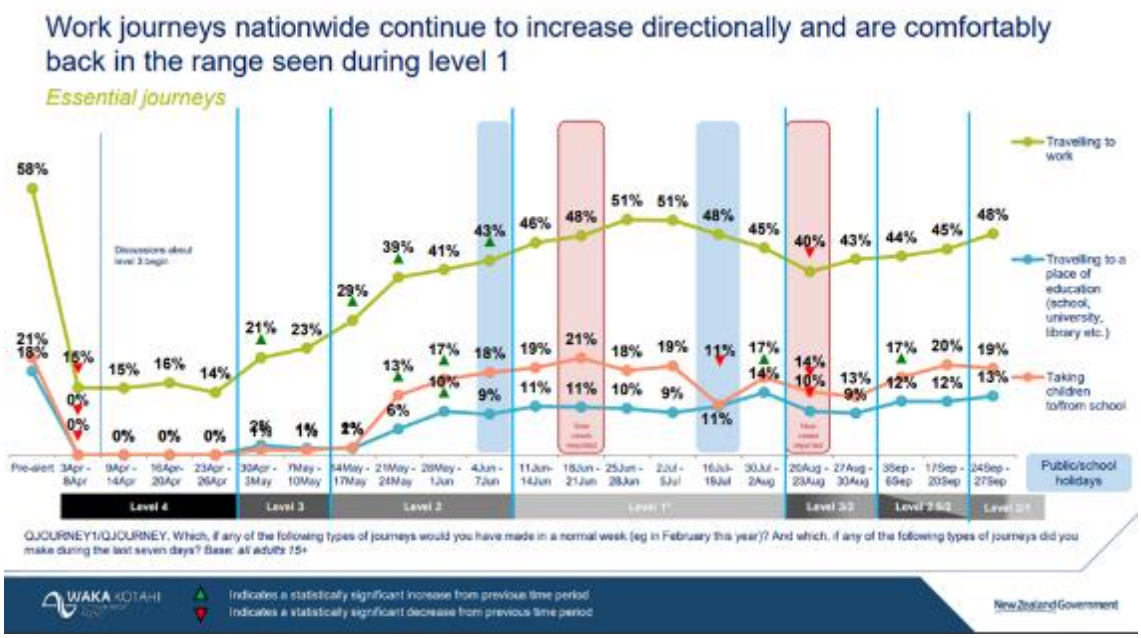
COVID-19 – mobility impacts

Not surprisingly, the various levels of COVID-19 lockdown to date have had a large impact on the mobility practices of New Zealanders, initiated by a dramatic drop in essential journeys seen in Level 4 (Waka Kotahi NZ Transport Agency, 2020c). While the broader trend is that behaviours seem to steadily recover as Alert Levels reduce, some may take longer to recover or stabilise at lower levels. At the end of September 2020, there remained a significant proportion who were self-isolating or only leaving the house for essential journeys, and public transport patronage is lower than pre-Alert Levels, meanwhile in Auckland at least, cycle counts suggest cycling rates may be starting to increase.

Journey purpose and frequency

Waka Kotahi's COVID-19 tracking data, dated September 29 2020, indicates the following.

- After a significant drop in travel for work during Level 4, journeys have steadily increased (aside from a reduction in August during Wave 2) but remain 10 percentage points lower than pre-Alert Levels.
- Essential journeys, such as travelling to school or university or transporting children, dropped significantly in Level 4 and 3 phases, and remain slightly lower than pre-Alert Levels.
- Essential journeys, such as shopping for groceries, going to a medical appointment, or travel to support a vulnerable friend/whanau, have recovered to some extent, however remain lower than pre-Alert Levels (based on September data). Forty four percent reported they would go to a medical appointment in a normal week, compared to 27% in the last 7-days and the proportion who report traveling to support vulnerable friends or whanau remains eight percentage points lower than pre-Alert Levels.
- Non-essential journeys (travel for leisure, visiting friends, non-essential shopping) have largely returned to normal levels around the country, apart from in Auckland where increases have been seen but pre-Alert Levels not fully restored.
- The proportion who report self-isolating (not leaving the house for any reason, excluding exercise) or only leaving the house for essential trips continues to drop, coupled with an increase in those who report a return to 'normal' travel behaviour. However, estimates suggest that 28% in Auckland, and 21% in the rest of the country are still partially or fully self-isolating.



Source: Waka Kotahi NZ Transport Agency (2020c)

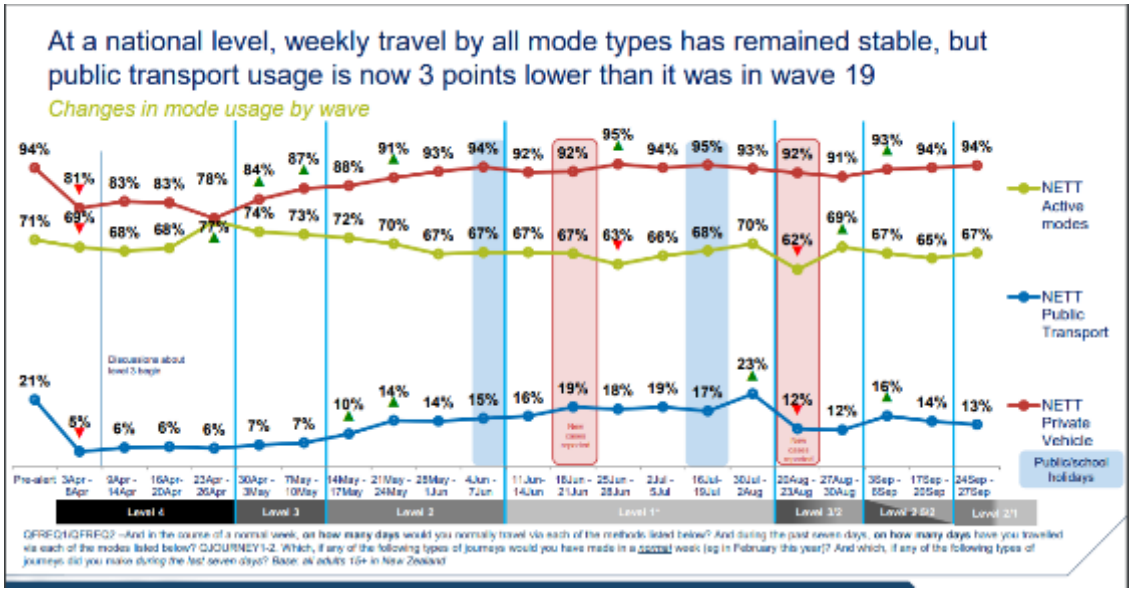
Travel mode and behaviour

On a national level, after an initial reduction in active mode use at the start of Level 4, there was a significant increase in active mode use towards the end of Level 4 and the start of Level 3, before gradually decreasing again to levels slightly below pre-Alert Levels in September (71% vs 67% NETT active modes) (Waka Kotahi NZ Transport Agency, 2020c).

Auckland Transport reports a significant reduction in commuter cycle trips during Levels 3 and 4, but an increase in recreational cyclist movements in residential areas (Auckland Transport, 2020). These localised increases in cycling during Level 4 were also reflected in Bike Auckland's citizen science report (Bike Auckland, 2020). Also in Auckland, from March to July, total cycling movements were lower in 2020 compared to the same month in 2019; however, as of August and September 2020 total cycling movements are now higher than the same month in 2019 (Auckland Transport, 2020).

Private vehicle use steadily increased from Level 3 onwards and has returned to pre-Alert Levels.

Public transport use gradually increased from Level 3 and was higher in Level 1 in July/August than pre-alert rates. However, after new cases were reported at the end of August patronage dropped again and remains lower than pre-Alert Levels.



Source: Waka Kotahi NZ Transport Agency (2020c)

An increase in speeding fines suggests that lower traffic volumes may have contributed to increased speeding - during May 2020 (Level 2), there were an additional 13,000 tickets issues compared to May 2019. Speeding behaviours may also affect the safety and attractiveness of active modes (Strang, 2020).