

The Energy Centre's research team targets top international peer-reviewed journals as their benchmark. The Energy Research Briefings series translates their work into plain language summaries for businesses, government agencies and the community, highlighting the impacts for practice and policy.

Impacts of COVID-19 response on mobility and transport mode choices: An early New Zealand study

New Zealand famously went “early and hard” in eliminating community transmission of COVID-19. And well before official data became available, quick-off-the-mark research* using Google mobility and Apple maps data has quantified the early impacts on mobility and different transport modes. The succinct research note writing it up, published promptly while the pandemic continued, carries implications for further response and recovery, most lastingly for public transport.

The study spanned 15 February – 9 July 2020. From 21 March, the government instituted Alert Levels, rapidly escalating to a month at the toughest, Level 4 “lockdown”, including closing schools and non-essential workplaces and grinding non-essential travel to a halt. Besides mandatory restrictions, people self-limited their movement. Descending stepwise to Level 1 by 8 June, life returned to almost usual, albeit within closed international borders. “Level Zero”, with borders open, remains mere aspiration as of March 2021.

Analysing data from Google COVID-19 Community Mobility Reports and Apple Mobility Trends, the researchers tracked mobility to three destination types (workplaces, retail/recreation, and public transport hubs like bus stations) via three transport modes (walking, driving, public transport) across four regions.

Alert Levels caused dramatic “structural breaks”. On average across destination types, Level 4 cut mobility by 69% – 89% against January baselines. Workplace travel, still 40% down at Level 3, trended back to pre-lockdown minus 2% due to working from home (WFH).

Mobility to retail and recreation destinations dropped by 89%, 75%, 25% and 10% across Levels 4 to 1 respectively, hurting those sectors economically. The persisting 10% likely reflects continuing fears of community transmission, avoiding non-essential activities and some businesses having failed. Hardest hit though were public transport hubs, still down 35% by the study's end due probably to those transmission worries

(whereas one might say cars are “bubbles”, while walking outdoors feels safe). Expensive new operational and cleaning protocols further burdened public transport.

Meanwhile, all three modes plunged during Level 4: from 75% for walking to 88% for public transport. Driving bounced back fastest, to near baseline. Regionally, mobility to workplaces fell comparably across Auckland, Wellington, Canterbury and Otago. Otago's return to retail and recreation lagged, potentially auguring slower economic recovery there. Public transport recovered best in Wellington.

Apple and Google data were mutually consistent, implying robust estimations. Moreover, proven consistency with New Zealand Transport Agency data served as validation that the sample represented the population, and similar analyses overseas have been comparable.

Overall, Alert Levels, major event cancellations, transmission worries and widespread WFH heavily (and Alert Levels differentially) impacted mobility and mode choice. The researchers conclude public transport impacts could persist, if measures like physical distancing among passengers lastingly dampen positive “social network effects”: that is, individuals choose public transport more when people close to them do. (Some WFH may also continue even post-pandemic.) They suggest operators consider niche innovations to minimise health risks and reassure passengers, while policies like mandatory mask-wearing on public modes, introduced only after the study, and promotional safety campaigns would help reshape behaviour and rebuild positive social networks.

*For the full research note by Le Wen, Mingyue (Selena) Sheng and Basil Sharp, see “The impact of COVID-19 on changes in community mobility and variation in transport modes”, New Zealand Economic Papers, published online 12 January 2021, <https://doi.org/10.1080/00779954.2020.1870536>.