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What Motivates Commuters to Choose Public Transport? Social Network Effects as a Key Factor

Urban planners and policymakers everywhere need to know what factors motivate transport choices, especially to coax commuters out of cars and into public transit. Besides infrastructure, obvious candidates include personal characteristics like whether commuters have car access – and perhaps dependents to take places. A recent study* in sprawling, congested, heavily car-bound Auckland deftly teases out these factors and subtler “social network effects”, or simply “network effects”.

The social network aspect built on reasoning begun by US economist Frank Goetzke in 2003: individuals were likelier to use public transit if others living close to them did. After all, the accessibility and quality of public transport are not higgledy-piggledy random, but similar within neighbourhoods; and we are social beings. For all that passengers make beelines for the most spread-out seats, generally we communicate, and feel safer together. Peer pressure, or transport culture, comes to bear, too. And knowing our neighbours take a certain train, say, tells us this service probably works.

Yet, because network effects, and crucially spatial ones as studied here, are complex to compute, empirical studies often miss them. This research applied sophisticated spatial modelling to Ministry of Transport Household Travel Survey weekday data on 820 trips to work among Auckland's (now 1.6 million) residents from both sparsely populated and denser districts sampled during two-day periods each financial year over 2005–2009. With only 40 train stations, the city nevertheless has some 8700 bus stops/stations and, most picturesquely, 13 commuter ferry facilities along the isthmus and in its gulf.

Results broadly bore out known trends. Roughly speaking, for instance, women took public transport to work about seven percent more than men, and commuters living with children four percent less than those without. Usage

rose with petrol prices – but notably little. Larger family size and living or working nearer a transit station, or commuting to the CBD where parking is at a premium, also tilted people towards public modes.

More spectacular than personal characteristics, except access to an extra vehicle, which slashed public transport use by 30 percent, were social network effects. Researchers could very confidently say a commuter's chances of taking public transport to work shot up over 20 percent for every one percent rise in peer use. This confirms international findings that network effects are real and relevant to forecasting and policy. Indeed, methodologically, omitting network effects actually biases research. Moreover, when public transport share rises, even more car-users will probably follow suit, as small behavioural changes fluidly slip the system into new “equilibria” or points of stability.

The researchers conclude social network effects are critical to green transport policy. Low-carbon infrastructure remains essential – and post-2006 the North Shore's express busway and upgrading Auckland's railways had improved uptake. But urban design should foster network effects too, and “soft” techniques like promotional campaigns can effectively complement, and raise returns to, infrastructure investment.

Conversely, one could now speculate COVID-19 measures, like social distancing on public transport, might dampen network effects.

*For the full article by Mingyue Sheng and Basil Sharp, see “Commuter's Transport Mode Preferences and Social Network Effects in New Zealand”, *Journal of Transport Economics and Policy* 2019, vol 53(1): 19–46.