Memorandum

To:	Shared Paths Working Group: Road Controlling Authorities' Forum
From:	Bridget Burdett, TDG; Stuart Locke, University of Waikato
Date:	6 September 2016
Job N°:	13860
Subject:	**Shared Footpaths: Evidence Concerning Economics of Inclusion**

Summary

This memo summarises a pilot study of people using shared paths in Hamilton, New Zealand. A 'shared path' is not clearly defined in New Zealand's Road User Rules but typically refers to a path that:

(a) may be a cycle path, a footpath, or some other kind of path; and

(b) may be used by some or all of the following persons at the same time:

i) pedestrians;

ii) cyclists;

iii) riders of mobility devices; and

iv) riders of wheeled recreational devices."[1]

Although this definition essentially includes all footpaths in New Zealand (because they may be used by pedestrians and riders of mobility devices at the same time), shared paths are typically understood as paths that can legally be used by cyclists regardless of wheel diameter, in contrast to 'regular' footpaths, which are restricted to cyclists with wheels smaller than 355mm in diameter.

The aims of this memo are to describe a pilot study of people using shared paths in Hamilton, and recommend next steps to address short and long-term questions.

The pilot study involved counting people using shared paths over 70 hours across six sites in Hamilton. The data showed diversity in the numbers and nature of people using these paths. The proportion of people using mobility aids varied from less than one percent at three sites (Hamilton Lake and alongside the Waikato River), to over nine percent on sections of Wairere Drive.

The main conclusions highlighted by these pilot data were that:

- there is diversity in use of shared paths in Hamilton;
- we can collect data to understand more about who uses shared paths; and

[1] http://www.legislation.govt.nz/regulation/public/2004/0427/latest/whole.html Clause 11.1A(1)

- more qualitative and economic data needs to be collected to establish the value of investment in infrastructure, and in particular the benefits to individuals, communities and broader society of being relatively more inclusive.

Measuring inclusion in transport is a research niche in its infancy worldwide; there is a dearth of information about the contribution of transport investment to individuals' broader health and wellbeing, and whether or not transport investment benefits all people equally. Recommended next steps to address this gap in understanding are to:

- Use these and other data to develop 'willingness to pay' indicators of utility of pedestrian infrastructure (including shared paths); and

- Explore differences in the relative value of a trip for different people (for example, commuter vs recreational trips, for people with and without alternative transport choices) to inform an economic appraisal framework for investment in public infrastructure.

The pilot data can help to address these questions by providing case study insights into who does and does not use shared paths, although it is clear that more comprehensive data ought to be collected. In particular, data about why people do and do not use paths; the value people place on accessible infrastructure, and other aspects of a location that encourage them to use it (for example accessible parking; lighting; seating; access to toilets; proximity to their home or end-use facilities) is also desirable.

There are short-term and long-term implications for this research. In the short term before appraisal methods are developed, it is recommended that road controlling authorities use tools such as accessibility audits to prioritise new and retrofit infrastructure. Analysis of catchment demographics can help RCAs to identify where best-practice may be most valuable, based on the needs of people likely to use pedestrian and shared networks.

In the long term it is recommended that these questions are pursued with further research, in conjunction with government stakeholders who are likely to accrue investment benefit from the questions being answered. By developing 'willingness to pay' indicators and deeper understanding of the value of a trip for different sectors of society, the transport industry can work towards more realistic accounting of the benefits and costs of its investment.

Pilot study: Rationale

There is a dearth of data about diversity of people using shared footpaths. In transport we have very little information about path users' age profiles, gender, ethnicity, and purpose for using the path. Furthermore, peoples' reasons for not using a path are unclear, which is particularly important for people who do not have independent access to a motor vehicle. The impact of a trip not made on peoples' health and wellbeing is not understood by Road Controlling Authorities (RCAs).

It is important that we learn more about perceptions and behaviour associated with shared paths, so that any move to increase their prevalence includes an explicit accounting of the impact of these decisions on all people. Although overall numbers of people using paths give some indication of quantum of participation, whether or not this is equitable and enabled for *all* people is important but poorly understood.

The rationale for investigating equity in transport investment stems from principles of human rights. New Zealand is a signatory to the United Nations Convention of the Rights of Persons with Disability.

As well as rights-based arguments for equity, there are also economic imperatives to consider. Decision-makers in RCAs may assume that their investment in public infrastructure is benefitting all people in their communities, but with no measurement of diversity of use of that infrastructure, the assumption cannot be tested. Information about where people are and are not using infrastructure can help RCAs provide the best outcomes for all people, and the best return on investment, to meet their strategic objectives.

The aims of this study are therefore to investigate equity in use of shared paths, to test whether human rights are being upheld, and whether investment is resulting in the best possible return for the investing RCAs. In this context the following research questions were addressed:

- Is there diversity in the number of people using shared paths by mode (three modes defined: cyclist / pedestrian / pedestrian using a mobility aid)?
- What do count data illuminate about potential equity issues in the provision of shared paths as transport infrastructure?
- What do count data suggest about economic benefits and costs associated with investment in shared paths?

Methods

People using shared paths were counted for a total of 70 hours across six sites in Hamilton, New Zealand. The count sites were:

- Wairere Drive: 3m wide concrete alongside a major/minor arterial road; generally good visibility and crossfall; gradients of no more than 1:12;
- River path: Variable surface (concrete / cobblestone) path alongside the Waikato River; variable width and visibility with several locations with gradients steeper than 1:12; and
- Hamilton Lake: Variable surface (concrete / boardwalk / cobblestone) path circumnavigating Lake Rotoroa).

Although no data about trip purpose have been collected on these paths, which now needs to be done, Wairere Drive is probably more likely to be used by commuters and people travelling to specific locations, whereas the river path and Hamilton Lake are more likely to be used as recreational facilities.

Data were collected at various times between 7am and 6pm on weekdays, and between 10am and 12pm on Saturdays, during July 2016. Surveyors counted all people using he paths, with separate columns for cyclists, pedestrians, and pedestrians using mobility aids (selecting from powered mobility scooter, manual and powered wheelchair, guide dog, white cane, and walking stick(s)/crutches, where applicable). Gender, ethnicity and age profile were not collected.

Results

Survey results are shown in **Table 1**. The results show diversity in the number and nature of people using shared paths. There were not enough people using mobility aids to meaningfully differentiate by type of aid, however it is worth noting that no manual wheelchairs, white canes or walking frames were observed at all during the survey period.

Site	Number of direction-hours	Cyclists per hour	Pedestrians per hour	Average mobility aid percentage (of all pedestrians) per hour
Wairere: Te Rapa	4	9	16	17%
Wairere Dr: Crosby Rd Underpass	20	3	3	10%
River Path (Hayes Paddock)	12	2	12	1%
River Path (Grantham Street)	16	2	8	0.0%
Hamilton Lake (Verandah Café)	20	3	90	0.2%
Wairere: Clyde	4	8	4	21%*
Total numbers observed	501	3366	42	1.2%

*Fewer than 20 pedestrians in total across four hours

Table 1 Count Results: Cyclists, Pedestrians and Mobility Aid User Proportion across six study sites in Hamilton, New Zealand

For comparison, the average proportion of people using mobility aids in Hamilton City is estimated as 3%, based on age and gender-specific rates of disability and mobility aid use in New Zealand.

Figures 1-3 show the relationships between peak and off-peak use for cyclists, pedestrians and mobility aided pedestrians separately.

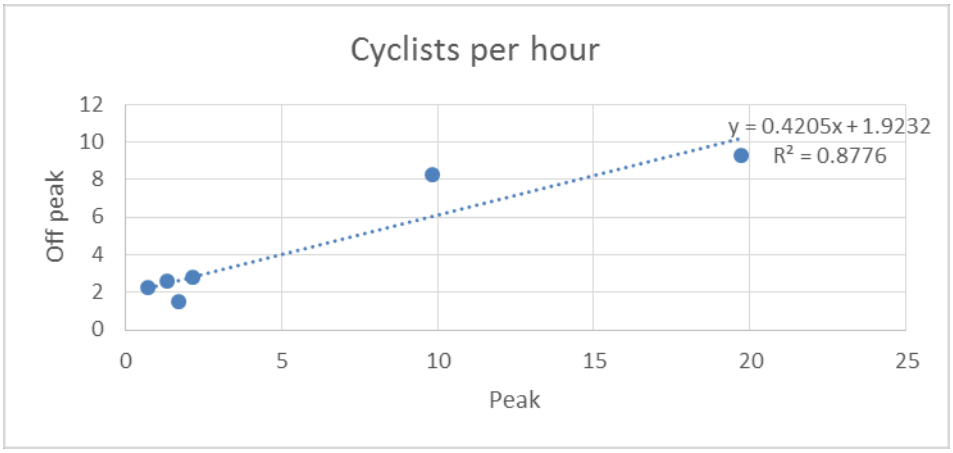

Figure 1: Cyclists per hour, per site: mean peak vs off-peak volume

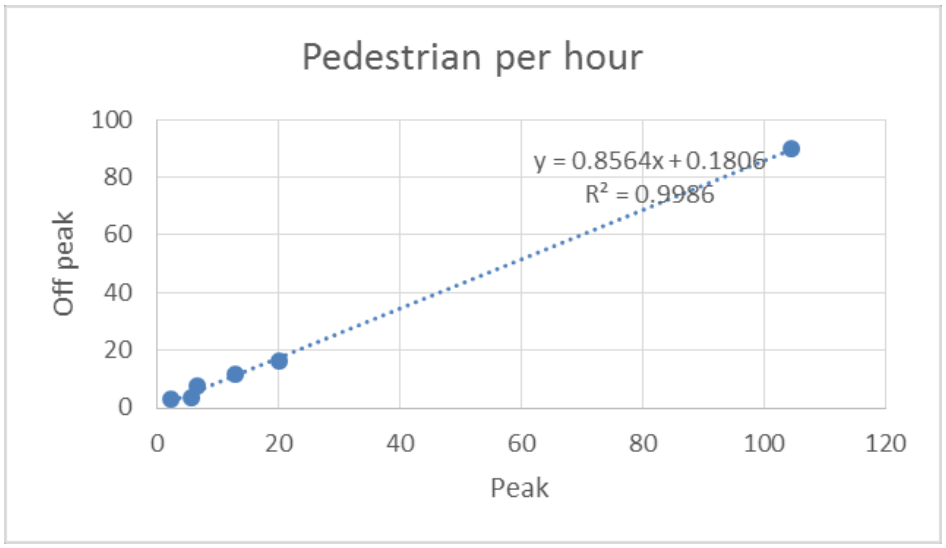

Figure 2 Pedestrians per hour, per site: mean peak vs off-peak volume

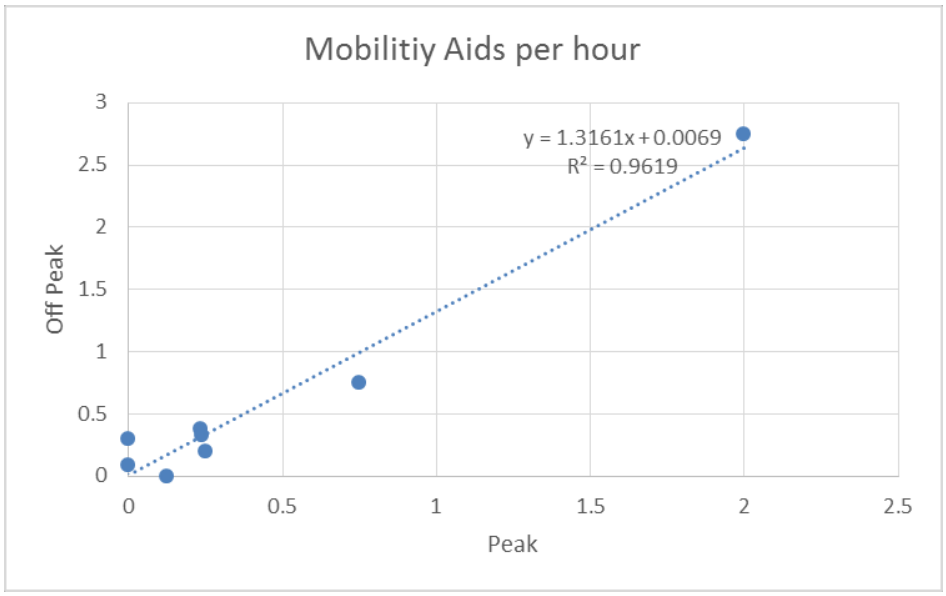

Figure 3 Mobility-aided pedestrians per hour, per site: mean peak vs off-peak volume

The data in Figures 1-3 show that there is a strong relationship between peak and off-peak in terms of numbers of cyclists, pedestrian and and mobility aid users. The three charts indicate for the pathways counted there is a difference between peak and nonpeak patronage. For both pedestrians and cyclists, there is generally more use of paths in peak than in off-peak times. This effect is most pronounced for cyclists, who have the largest difference between peak and off-peak path use: the data show roughly 85 cyclists in off-peak times for every 100 in peak times. However, pedestrians using mobility aids are more common in off-peak times: 131 in off-peak times for every 100 in peak times. These findings suggest that people who use mobility aids may be more likely than other pedestrians to use paths for recreation, and in generally less-busy times.

Discussion

In terms of the first research question, results suggest that there is indeed diversity in the number of people using shared paths according to mode. This diversity in nature complements information about overall usage, because it implies that equity of participation cannot be assumed by volume alone. For example, the highest numbers of people were observed on the shared path at Hamilton

Lake. This may lead an RCA to consider its investment a success, but this depends on the investment objective sought. With only six out of 2,636 people counted, using a mobility aid at Hamilton Lake, the investment is clearly benefitting some subset of Hamilton's community. Similarly, low proportions of mobility aid users were observed on Hamilton's river paths.

However, higher proportions of mobility aid users were observed on Wairere Drive shared path. This path is constructed to a higher accessibility standard, with consistent 3m width, relatively shallow gradients and a smooth concrete surface.

Regarding the question of equity in making decisions about infrastructure investment, these results suggest that revealed preference data (ie, observational survey data, in this case including mobility aid proportion) can provide insight into relative equity. They can also inform policy and design standards with information about links between level of service and diversity of participation. The data suggest that some people using some types of mobility aids will use shared paths, so long as they provide a reliable level of service. However, busy paths with inconsistent standards of width, visibility and gradient are less likely to be used by the full cross-section of society.

Finally, the data suggest a research direction concerning economic benefits and costs associated with investment in shared paths. In particular, it is important to understand why people do and do not use particular paths. As well as level of service issues to do with technical path specifications, there may be other factors: high volumes of pedestrians or cyclists may be a deterrent to some people; the facilities available along the path (such as toilets and seating, and participation opportunities such as parks, playgrounds and cafes) may also affect peoples' decisions about whether or not to use the path.

These questions are important because without a comprehensive economic appraisal framework that considers all practically measurable components of peoples' decision-making, the value of any investment cannot be assessed. The questions are complex because the investment benefits (such as mental and physical health) may not be within the mandate of the investing agency (for example an RCA).

Recommendations

The complex nature of the questions raised by these pilot data reveal a need for alternative measures of the purpose for, and value of transport networks. To improve on traditional benefit-cost appraisal methods, there is a need for a cross-sector investigation into the economic benefits and costs associated with active modes infrastructure. Traditional transport appraisal frameworks are focused on improved travel times and an assessment of crash outcomes. These fail to meaningfully consider wider issues that affect the usage of transport infrastructure. Costs related to perceptions of safety and amenity, and broader societal benefits associated with equity of participation, are unlikely to be captured by a transport-specific appraisal framework. Analysis of catchment demographics in conjunction with transport investment planning, as one example, can help a road controlling authority to identify where best-practice interventions may be most valuable, based on the needs of people likely to use these networks.

It is recommended that the research now progresses to developing 'willingness to pay' indicators and deeper understanding of the value of a trip for different sectors of society. It is also recommended that, in the interim before appraisal methods are developed, local road controlling authorities use tools such as accessibility audits to prioritise providing or retrofitting infrastructure for the active modes.

TDG