Public Housing Tenants' Transport Access and Willingness to Reduce Emissions

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Article

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Abstract

Public rental housing in Aotearoa New Zealand is a safety net in a pressured housing market with often unaffordable rents. The needs and behaviours of public housing tenants may differ from more prosperous New Zealanders'. The present paper focuses on transport behaviours and preferences of this group, as part of a wider research programme ('Public Housing and Urban Regeneration') addressing tenant wellbeing and behaviour. Particular ways in which such tenants use transport are identified in Keall et al. [1]. To dig deeper on tenants' transport patterns and access, and understand their willingness to reduce emissions, we surveyed 160 public housing tenants, via a mail-back questionnaire in mid-2023. The responses represented 66% of those approached. Key findings are that public housing tenants, while often using cars, especially as passengers, frequently use public transport (PT) (40% of respondents) and active transport (walking 68%; cycling 17%). However, tenants' transport preferences are often unmet. For example, for everyday needs, 36% of respondents would prefer to use a car less; 42% said easily walkable access to shops or facilities would help in taking fewer car trips. Such findings from our survey suggest that housing providers, council planners and public transport operators should collaborate to make public rental housing as accessible as possible, locating new housing close to public and active transport facilities and shops; and recognising that tenants overwhelmingly see local easy access, including better PT, footpaths and cycle paths in their neighbourhood as making it easier to travel car-free, thereby reducing emissions.

Keywords: public housing; wellbeing; sustainable transport; carbon emissions; accessibility; transport equity; Māori

1. Introduction

This paper focuses specifically on the transport mode choices of public housing tenants in Aotearoa New Zealand ('Aotearoa'), and implications for tenants' wellbeing and carbon emissions. In Aotearoa, the total public and community housing (hereafter 'public housing') rental housing stock makes up about 4% of the country's total dwelling stock. This proportion compares with an average of around 7% in OECD countries [2], Figure 1.37. The overall size of Aotearoa's public rental housing stock is modest, at around 84,800 dwellings at October 2024 [3]. This comprises around 75,000 Kāinga Ora houses [4], of which 71,100 attract an income-related rent subsidy [3], together with around 13,800 community houses attracting the income-related rent subsidy, at October 2024. This public rental housing stock is valuable in meeting the exceptional needs of a number of low-income households. Private market rental housing costs are particularly unaffordable in Aotearoa; for the lowest income quintile, rental housing costs are the highest in relation to incomes in the OECD, according to the latest published OECD data [2, Figure 1.36C]. For these and other reasons, there is considerable interest in what wellbeing benefits the public rental housing stock delivers, and the needs and behaviour of public rental housing tenants.

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We, the Transport Strand of the Public Housing and Urban Regeneration research programme (PHUR), carried out a scoping review of the international literature on the transport access of public housing tenants [5]. This showed that easy walking and (low cost) public transport access to basic amenities and destinations improves wellbeing for public housing tenants through better employment, social connection, and physical and mental health, and is a vital issue for public housing tenants and providers. However, those destinations that are fundamental to wellbeing varied, emphasising the importance of understanding the needs and preferences of the specific public housing tenant population.

This scoping review also highlighted that a lack of transport choices (either due to limited transport facilities or the location of public housing developments) reduced wellbeing. In car-dependent societies, restricted ability to use private vehicles and being forced to rely on public transport or walking was associated with reduced employment opportunities, missed healthcare appointments, poorer diets, increased social isolation, and negative impacts on physical and mental health and wellbeing. However, having to rely on a car also puts substantial pressure on already constrained incomes, and has associated negative physical and mental health impacts due to a lack of physical activity.

The literature review also covered Māori and Pacific people's public housing tenants' perspectives on transport and wellbeing and found that the key contribution transport makes to the wellbeing of Māori and Pasifika public housing tenants is through the connections transport supports and the relationships it facilitates with the surrounding social and physical environments.

Another recent study of Aotearoa public housing conditions is suggestive, although its scope (access to public parks) is limited. It found that public housing tenants in Aotearoa had relatively poor access to public parks [6]: "those in public housing neighbourhoods tend to have access to a smaller number of parks that are smaller in size than those in non-public housing neighbourhoods…"(p.9) and access to facilities may be more limited.

With these patterns of travel in mind, the Transport Strand of the PHUR research programme carried out in mid-2023 a survey of public housing tenants, focusing on their transport. The aim was to investigate tenants' transport access, barriers to access (relevant to Sustainable Development Goals 3, 10 and 11) and willingness to reduce carbon emissions (SD Goal 13).

The rest of this paper describes the origin and demographics of the sample, and findings in the following three areas: a) travel abilities and transport choices; b) matters of accessibility and parking; and c) current actions which respondents are taking, or would consider, to reduce transport carbon emissions, and factors influencing willingness to reduce transport emissions.

2. Materials and Methods

This study's transport-focused survey ('the survey') was undertaken as a follow-up to a broader PHUR survey of public housing tenant wellbeing, during which a number of tenants agreed to be further surveyed on related matters. The PHUR Transport strand was allocated 62 tenant addresses for the (follow-up) transport survey. This was augmented by a sample of 180 Ōtautahi Community Housing Trust tenants included in a mobility study who had also indicated their willingness to be surveyed again. That study, 'Getting Around 2021', was undertaken by the University of Canterbury: https://ir.canterbury.ac.nz/items/dce20ad5-7a14-4c62-a3d0-7a8d0e00d705. This approach yielded responses from 160 public housing tenants (66% of those approached), in June and July 2023, largely (80%) in Ōtautahi Christchurch, plus limited numbers in other public housing locations – Porirua and Whanganui-a-Tara Wellington (28) and Tāmaki Makaurau Auckland (4).

This transport-focused survey gives more depth in relation to transport than the wider PHUR 'Your Wellbeing at Home survey' whose main findings are published elsewhere [7]. The wellbeing survey included questions on the tenant's house, and questions relating to a range of factors expected to interact with housing in influencing wellbeing, including public transport quality. In particular, it was found that tenant wellbeing, as measured by the WHO-5 mental well-being scale (an affect measure relating to the past two weeks), was strongly and positively associated ($p<0.01$) with public

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transport quality. The present transport-focused survey digs more deeply into transport and associated sustainability issues, including matters of access suggested by the literature review described earlier, matters of car parking near the tenants' home; and tenants' willingness to contribute to reducing transport carbon emissions by, for example, switching to more sustainable modes.

The survey sample had the following salient characteristics:

- 16% of respondents were Māori. This compares with 44% of respondents identifying as Māori in the 2022 Easy Access and Sustainable Transport (EAST) survey of Kāinga Ora customers [8]. The EAST survey covered tenants nation-wide, while the present survey's principal catchment was Ōtautahi Christchurch, which has a lower percentage Māori in its population. The Stats NZ Census found 13% of people identified as Māori in the city in 2023.
- 39% did not have or use a car. A city council survey of Ōtautahi Christchurch households showed 7% did not have a motor vehicle.
- 35% were unable to walk a significant distance: these tenants had an injury, health condition or disability that meant they were unable to walk far (10 minutes or more). This compares with 16% of Kāinga Ora respondents in the EAST survey who did not walk for trips of at least 100m at all in the last year, and about 40% of respondents who said that "my health or disability means I can't walk far." [8, p.23].
- 25% of the sample noted that their health or disability meant that they cannot use a bus or train.

3. Results

3.1. Ability to Walk

We initially focus on walking as this is critical to local access for public housing tenants. The ability to walk involves nuances of walking ability (Table 1). We are particularly interested in the 35% of the sample who were less able respondents, i.e., who "don't walk or don't walk far (10 minutes or more)," because of an injury, health condition or disability. Interestingly, 43% of this group said they walked frequently ("at least once a week" or "twice a week or more"), for "trips of at least 100 metres, about 1 or 2 mins").

Table 1. Nuances of walking mode choice: use of walking mode by ability to walk.

'How often have you, in the last 12 months,…'	Frequently (%)	Occasionally (%)	Not at all (%)	Total
Those 'able' to walk: *…walked for trips of at least 100m (about 1 or 2 mins)?*	81%	12%	6%	100% (n=95)
Those 'less able' to walk: *…walked for trips of at least 100m (about 1 or 2 mins)?*	43%	33%	24%	100% (n=51)

'Less able' is defined here as those who "don't walk, or don't walk far (10 minutes or more)" because of an injury, health condition or disability. Conversely, those 'able' to walk are those for whom an injury, health condition or disability was not an obstacle to walking or walking far (10 minutes or more). Cases with missing values on the variable in focus are excluded in relevant breakdowns.

We conclude that although most were unable to walk far, they did frequently walk short distances. This underlines the case for easy walkable access to nearby amenities. A third (33%) of the less able respondents said they walked occasionally ("a few times" or monthly) in the last year. At the extreme, 24% of the less able group said they "did not walk at all in the last year."

Among able respondents, for whom disability etc. was not an obstacle, 81% said they walked frequently; 12% indicated occasionally, and only 6% said they did not walk at all in the last year.

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Overall, for the entire sample of respondents (Table 2), taking the less able and able groups together, two-thirds (68%) said they walked frequently, while 20% said they walked occasionally. Only 12% said they did not walk at all in the last year.

Exactly how much walking is desirable for health is complex: the Mayo Clinic, for example, suggests 30 minutes of physical activity per day is generally desirable. If it can be assumed that walking only occasionally or not at all (for trips of at least 100m, about 1 or 2 mins) is unlikely to be sufficient to maintain healthy personal mobility, then almost a third (32%) of respondents appear not to be walking sufficiently for health (57% among the less able, 18% among the able).

3.2. Behavioural Patterns

The survey gathered data on how public housing tenants usually travelled, and whether local transport facilities constrained (or otherwise) access.

3.2.1. Mode Choices

Respondents were asked 'How often in the last 12 months have you travelled outside your home in these different ways?' (followed by prompts: bike, public transport, community transport, car (driven), car (passenger), walked, e-scooter, mobility device, other). Some 68% of respondents were frequent walkers and 20% occasional walkers; altogether 88% were frequent or occasional walkers. Overall, walking, followed by public transport, were the more popular – and sustainable – transport mode choices.

Almost three quarters of respondents used public transport (73%; with 44% being frequent users, and 29% occasional) (Table 2). As noted above, 25% of respondents noted that their health or disability meant that they cannot use a bus or train. We found 17% of respondents were frequent bike users, and 8% occasional bike users; altogether 25% were bike users. (This is a higher figure than for public housing tenants nationally, related to the fact that most of the sample were from Ōtautahi Christchurch, where cycling rates are higher).

Table 2. Mode choice breakdown: the main transport choices outside the home.

'How often have you, in the last 12 months,…' (%)	Frequently	Occasionally	Not at all	Total
…Walked for trips of at least 100m (about 1 or 2 mins)	68%	20%	12%	100%
…Used public transport	44%	29%	27%	100%
…Ridden a bike	19%	9%	71%	100%
…Car driver	54%	8%	39%	100%
…Car passenger	36%	51%	13%	100%

Cases with missing values on items in focus are excluded in relevant breakdowns. We define 'frequently' as 'at least once a week' or 'twice a week or more,' and 'occasionally' as 'at least once a month,' or 'a few times' (in the last 12 months).Source: PHUR Transport Survey, June-July 2023. For 'Walked…' row, n=146.

3.2.2. Cost of Transport

Public transport users (both frequent and occasional) were asked 'How often do you find it difficult to meet the cost of transport?' 22% of such respondents said never; 32% said quite or very often. 25% of frequent public transport users said they find it difficult to meet the cost of transport quite often or very often, while 41% of occasional public transport users said the same.

When public housing tenants who are bike users were asked 'How often do you find it difficult to meet the cost of transport?', 15% of respondents said never. Obversely, 41% of frequent bike users said that they find it difficult to meet the cost of transport quite often or very often, while 67% of

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occasional bike users said quite often or very often; overall, 49% of bike users said quite often or very often.

These figures suggest that, among public housing tenants, about 40% of occasional public transport users and two-thirds of occasional bike users struggle with household costs to the point where they find it difficult to meet the cost of transport much of the time (quite often or very often). Since cycling itself is not costly, we infer that many tenants who are cyclists (in particular) are sensitive to the costs of transport and may be cycling to limit these costs.

3.2.3. Transport Facilities and Tenants' Access

We aimed to establish whether local transport facilities constrained tenant transport access. In general, respondents considered that local transport facilities around where they live generally did not constrain their transport or access.

Of the 40% of the sample who were frequent public transport users (weekly or more), only 10% said they found the local transport facilities very limiting, while 89% saw them as not limiting or only somewhat limiting. For occasional public transport users (monthly or less), only 5% found the facilities very limiting.

Of the relatively few (17% of the sample) who were frequent bike users (weekly or more), 7% said they found the transport facilities very limiting, but 93% said the transport facilities were not limiting or only somewhat limiting.

3.3. Car Use and Associated Preferences

We aimed to establish whether local transport facilities constrained tenant transport access. In general, respondents considered that local transport facilities around where they live generally did not constrain their transport or access.

Respondents were asked whether they currently had a car or used one. Overall, 39% of respondents said they did not have or use a car. In some cases, this suggests difficulties in transport access, particularly considering that 25% of all respondents said they were not able to use public transport (bus or train), and 35% said they were not able to walk or walk far. Among the less able to walk group, 44% said they did not have or use a car. Among the able to walk group, 36% said they did not have or use a car.

The survey asked whether respondents would prefer to do more, or less, travelling by car for everyday needs. Over a third (36%) responded that they would prefer to use a car less (14% much less, 22% a bit less); 40% responded that they would prefer to use a car about the same amount; and 23% would prefer more (13% a bit more, 10% much more). Overall, there was an orientation to using a car less for everyday needs.

3.4. Accessibility, Car Trips and Car Parking

We explored further the question of access to local facilities, car use and car parking. Focusing on the less able group (n=55), 43% said that having "nearby easily walkable access to shops or facilities such as a café, groceries, a medical centre and/or other shops" would help or help somewhat in taking fewer car trips.

Second, focusing on the able group of walkers for whom disability etc. was not an obstacle, nearby facilities were still often viewed as making a difference. 41% of this group said that having "nearby easily walkable access to shops or facilities such as a café, groceries, a medical centre and/or other shops" would help or help somewhat in taking fewer car trips. This is a slightly lower but broadly similar proportion to the proportion among the less able.

Overall, taking all the walkers together (less able and able), 42% said that "nearby easily walkable access to shops or facilities such as a café, groceries, a medical centre and/or other shops" would help or help somewhat in taking fewer car trips (and 16% said it would not or was unlikely to help). That

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is, a substantial minority (almost half of respondents) indicated they were likely to respond positively in practice to accessibility improvements, in deciding whether or not to take fewer car trips. It also suggests that better local access to everyday amenities is important for almost half of public housing tenants if emissions are to be lowered by reducing car trips.

The context is that public housing tenants in Aotearoa are not necessarily located in accessible places – we mentioned above that public housing tenants' access to public parks is often relatively poor [6]. Nevertheless, our study found that around 31% of respondents feel they "already" have "nearby easily walkable access to shops or facilities such as a café, groceries, a medical centre and/or other shops", so the question of improved access is generally not a major issue for these tenants. A small minority (9%) found it "hard to say" whether better access would help. But it is notable that for a good proportion of respondents (42%), there was nevertheless a positive response to the idea of better walking accessibility.

A significant aspect of transport mode choice and car use is car parking. Public housing developments differ in car parking availability, and the amenity varies in importance to the people who live there. We asked, 'How important to you is car parking near your home?' Some 55% said quite important or very important. Perhaps predictably, as they often find it necessary to use cars, 53% of those who were less able to walk said car parking near their home was quite important or very important. Interestingly, even more (57%) of those able to walk said such parking was quite important or very important. In both groups, then, near-home car parking is a concern for a majority of public housing tenants, even though about one-third (32%) considered it not relevant, or unimportant. This finding is consistent with that of a recent Kāinga Ora ('EAST') survey of public housing tenants [8].

3.5. Access, Physical Facilities and Services

3.5.1. Facilities

Respondents were asked, '…would better public transport, footpaths and cycle paths in your neighbourhood make it easier for you to travel without using a car?' Among the able walkers, 87% said yes (slightly or much easier), while among the less able, 75% said yes. This suggests there would be a significant positive contribution from better physical facilities such as local footpaths and cycle paths towards sustainable mode choice among tenant respondents.

3.5.2. Services

Respondents were asked whether certain features of a better bus or train service would help them to use it more. Responses are summarised in Table 3. We note that 25% of the sample recorded that their 'health or disability means I cannot use a bus or train'.

Some of these hypothetical features are more amenable or less costly to change than others. For example, the distance from home to the bus or train station might only be reduced through a rehousing of the respondent, while in other situations there might be a short-cut accessway constructed to reduce this distance.

The feature most often (64%) seen as helping respondents use services more was an improved bus or train station/shelter. Lower bus or train fares (59%) and Increased service reliability (55%) also scored relatively highly as options for improving public transport attractiveness and use. It is also notable that, for public housing tenants, Improved walking conditions (e.g., better footpaths) to the bus or train station, and Not having to change bus/train along the route to their destination scored slightly more highly than Increasing public transport service frequency.

These findings may be especially relevant to Environment Canterbury and Christchurch City Council, given that the survey sample is largely drawn from Christchurch, but also to other regional councils contemplating public transport and urban infrastructure investments.

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Table 3. Which features of better bus or train services would help respondents use services more (ordered by popularity of service feature).

Feature	'No help'	'Hard to say' / Neutral	'Yes, would help'
An improved bus or train station / shelter (e.g., more rain and wind-proof)	11%	25%	64%
Lower bus or train fares	15%	26%	59%
More reliable bus or train services (e.g., fewer delays)	15%	29%	55%
Improved walking conditions (e.g., better footpaths) to the bus or train station	20%	30%	50%
Not having to change bus or train along the route to my destination	14%	37%	50%
More frequent bus or train services	19%	34%	48%
A shorter walking distance from your home to the bus or train station	35%	26%	39%

Source: PHUR Transport Survey, June-July 2023.

4. Findings on Reducing Carbon Emissions

4.1. Particular Actions

Asked about possible actions to reduce their transport carbon emissions, and particular actions respondents might take in future, 43% of able walkers indicated they would "switch to walking, cycling or public transport whenever I can". For less able walkers, the proportion was 27% (and overall, 38%).

Respondents 8. of respondents responded to the question by selecting 'None of these – I will not be able to reduce my transport carbon emissions', suggesting that the vast majority were generally open to considering ways of reducing emissions. The responses are shown in Table 4.

Table 4: Respondents' support for actions they might take to reduce transport carbon emissions (ordered by extent of support for action).

Actions (prompts offered)	'Yes' response
Try to use shops or facilities that are closer to where I live, so that I can walk or bike	39%
Switch to walking, cycling or public transport whenever I can	38%
Try to reduce the number of car trips I take	37%
Car share (or an electric car share)	15%
Go "car free"	13%
Use a smaller car	13%
Use an electric or standard scooter	9%

Source: PHUR Transport Survey, June-July 2023.

In addition to the responses shown in Table 4, 16% of respondents nominated other ways of reducing transport emissions, ranging from 'getting an e-bike' to using a mobility device.

Table 4 suggests that moving away from car trips through means such as Car sharing (15% support) or Using a smaller car (13% support) would be difficult for many respondents. The most

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popular option among those offered was to "Try to use shops or facilities that are closer to where I live…." (39% support).

5. Discussion and Conclusions

This survey has provided for the first time a detailed picture of Aotearoa New Zealand public housing tenants' mode choices, transport access, and willingness to make choices that reduce transport carbon emissions. Limitations include that the sample size is not large (n=160), and is drawn mainly from one city in Aotearoa (the second largest), but the response rate of those approached was high (66%), the sample is diverse (e.g., Māori are 16% of the sample) and it provides the best published picture available to date of the preferences and views of a sub-population that is distinctive and politically important, yet not thoroughly investigated in research thus far. The findings appear consistent with research on tenants' transport choices that does exist, such as an in-depth study of a small sample of Māori social tenants [9].

From the point of view of equity in the provision of transport access, it is important that the needs and preferences of the population in public housing are understood. Even though carbon emissions by public housing tenants are modest, it is useful to understand how their transport emissions might be lowered while not further disadvantaging this population. The following findings stand out in relation to reducing emissions:

- Public housing tenants, while often using cars, especially as passengers, are particularly likely to frequently use public transport (40% of respondents) and active transport, with walking at 68% and cycling at 17%;
- A third of public housing tenants are not able to walk or walk far. Among able respondents for whom disability etc. was not an obstacle, 81% said they walked frequently;
- Many public housing tenants struggle with household costs to the point where they find it difficult to meet the cost of transport much of the time (quite often or very often);
- Car parking near their home was important for most (55%) public housing tenants, although 39% do not have or use a car;

  Local transport facilities around where tenants live were perceived by respondents as having only a limited constraining impact, in terms of transport or access;
- In terms of travelling by car for everyday needs, there was a general orientation to using a car less or about the same;
- 42% said that nearby easily walkable access to shops or facilities would help or help somewhat in taking fewer car trips;
- A large majority agreed that better public transport, footpaths and cycle paths in their neighbourhood would make it easier to travel without using a car;
- Improved bus or train station/shelters was the feature most often (64%) seen as helping respondents use services more; lower bus / train fares (59%) and increased reliability (55%) were also favoured for improving public transport attractiveness and use;
- A large minority of respondents indicated they would 'switch to walking, cycling or public transport whenever I can'. Moving away from car trips through means such as car sharing would be difficult for many respondents. The most popular option among those offered was to 'try to use shops or facilities that are closer to where I live….' (39%).

The findings of this paper suggest that it is important for Aotearoa's housing providers, council planners and public transport operators to collaborate further to make public rental housing as accessible as possible, including to ensure that such housing is located close to high quality public and active transport facilities, amenities and shops. In some instances, public transport routes need to be (further) adjusted to improve access; and further investment in footpaths and cycle paths is essential. These steps would recognise that public housing tenants overwhelmingly see better public transport, footpaths and cycle paths in their neighbourhood as making it easier to travel without using a car, thereby enabling vehicle emissions to be reduced.

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Data Availability Statement: Data supporting reported results can be sought by applying to the PHUR programme data repository, c/o Prof. M. Keall, University of Otago, michael.keall@otago.ac.nz Individual sample survey data is unavailable due to privacy or ethical restrictions.

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Conflicts of Interest: R.C., M.K. and E.R. declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest. P.H.-C. notes her position as a director on the board of Kāinga Ora from 2019 to 2025. The funders had no role in the design of the study; in the collection, analyses, or interpretation of data; in the writing of the manuscript; or in the decision to publish the results.

Abbreviations

The following abbreviations are used in this manuscript:

MDPI	Multidisciplinary Digital Publishing Institute
OECD	Organisation for Economic Cooperation and Development
PHUR	Public Housing and Urban Regeneration (programme)
PT	Public Transport

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