



Locating transport sector responsibilities for the wellbeing of mobility-challenged people in Aotearoa New Zealand



Mythily Meher^{a,1}, Julie Spray^a, Janine Wiles^b, Anneka Anderson^c, Esther Willing^d, Karen Witten^e, Malakai 'Ofanoa^f, Shanthi Ameratunga^{a,*}, on behalf of the Inclusive Streetscapes Project Team

^a Section of Epidemiology and Biostatistics, School of Population Health, Faculty of Medical and Health Sciences, University of Auckland, Private Bag 92019, Auckland 1142, New Zealand

^b Section of Social and Community Health, School of Population Health, Faculty of Medical and Health Sciences, University of Auckland, Private Bag 92019, Auckland 1142, New Zealand

^c Te Kupenga Hauora Māori, Faculty of Medical and Health Sciences, The University of Auckland, Private Bag 92019, Auckland 1142, New Zealand

^d Division of Health Sciences, University of Otago, PO Box 56, Dunedin 9054, New Zealand

^e SHORE and Whariki Research Centre, Massey University, Level 7, 90 Symonds St, Auckland 1010, New Zealand

^f Section of Pacific Health, School of Population Health, Faculty of Medical and Health Sciences, University of Auckland, Private Bag 92019, Auckland 1142, New Zealand

ARTICLE INFO

Keywords:

Wellbeing
Mental health
Transport infrastructure
Old-age
Disability
Place
Colonization

ABSTRACT

Introduction: wellbeing is a central tenet in the Aotearoa New Zealand government's Transport Outcomes Framework. Yet considerations of how place mediates diverse opportunities for wellbeing seldom identify how decision-making on transport and pedestrian infrastructure affects these opportunities. Considering the lived realities of older people and people with disabilities with a specific focus on Indigenous people, we argue it is particularly important to identify the role infrastructure plays in enhancing or undermining wellbeing for diverse communities. We also highlight state or sector responsibility for neglectful, wellbeing-diminishing infrastructure.

Methods: we ground this argument in community-based participatory research findings of qualitative interviews conducted at home and during neighbourhood walks with 62 older or mobility impaired people in socio-demographically diverse neighbourhoods in Auckland, Aotearoa New Zealand. The interviews explore community perceptions of mobility and wellbeing as experienced through the losses, stresses and joys of everyday life contexts and places.

Results: we find that people seek experiences of beauty, joy, belonging, fitness, and sociality when going out, but the pursuit of these are curtailed by significant infrastructural impediments with attendant emotional costs, burdens, and risks. Historical decisions shape contemporary possibilities for wellbeing in place, and historical infrastructural injustices impacting on transport and mobility particularly affect Indigenous people's opportunities for mobility-based wellbeing.

Conclusion: drawing on place-specific history and experiences of risk, we shift focus from individualized capacities to live well to conceptualizing wellbeing at a collective level, exploring place-based possibilities for a good life. These elaborations allowed us to identify signs of policy and practice abandonment and neglect, and articulate a vision for more inclusive, equitable transport infrastructure that enables the wellbeing of people differently challenged by urban environments.

* Corresponding author.

E-mail addresses: m.meher@auckland.ac.nz (M. Meher), j.spray@auckland.ac.nz (J. Spray), j.wiles@auckland.ac.nz (J. Wiles), a.anderson@auckland.ac.nz (A. Anderson), esther.willing@otago.ac.nz (E. Willing), k.witten@massey.ac.nz (K. Witten), m.ofanoa@auckland.ac.nz (M. 'Ofanoa), s.ameratunga@auckland.ac.nz (S. Ameratunga).

¹ Dr Julie Spray's Present address: Division of Public Health Sciences, Washington University of St Louis, 660 S. Euclid Ave, Campus Box 8100, St. Louis, MO 63110, United States.

1. Introduction

The increasing popularity of policies focusing on wellbeing suggest global shifts in state sector aspirations to promote 'flourishing' rather than merely avoid deficits. Reflecting this trend, wellbeing is a central tenet in the Transport Outcomes Framework in Aotearoa New Zealand (Ministry of Transport 2018). As reviewers of the extant research argue, however, wellbeing is a quintessentially fuzzy concept (Nordbakke and Schwanen, 2014). If it is to be effectively pursued as a policy goal, we need to understand the meaning of wellbeing for diverse social groups and identify the roles transport infrastructure and planning decisions play in enhancing or undermining it.

Drawing on qualitative interview data from 62 older or mobility-impaired people, this paper explores diverse culturally, personally, relationally and historically constituted experiences and expressions illustrating the linkages between transport, mobility and wellbeing. Following theoretical developments in urban geography (Schwanen and Nixon, 2019; Graham, 2010), we define transport infrastructure as encompassing spatial hardware (like roads and sidewalks); the soft, malleable, and social elements of urban connectivity (like plants and bus drivers); and the sociotechnical (like pre-paid swipe cards for public transport). These all mediate mobility and have ambient, aesthetic and political significance for those moving through places (Schwanen and Nixon, 2019; Larkin, 2013).

There is a large literature on how infrastructure mediates possibilities for mobility-based wellbeing. This includes a pragmatic focus on an individual scale, such as access to work, study, exercise, sociality and maintaining households, as captured in terms of 'a good life' or social and personal capital (Nordbakke and Schwanen, 2014; Gallagher et al., 2011; Jones et al., 2013), and extends to a more holistic, collective-focused level, as captured by concepts like 'liveability' (Hamraie, 2018), pedestrian accessibility (Clarke et al., 2009), social inclusion (Litman, 2003) and environmental resilience (Lawton, 1999). Possibilities for infrastructural wellbeing are skewed to favor more privileged groups of people on the basis of factors like age (Nordbakke and Schwanen, 2015), race (Winner, 1980), gender (Anand and Tiwari, 2006), disability (Imrie and Wells, 1993), socio-economic status and the interaction of these (Raerino et al., 2013; Tennakoon et al., 2020; Spray et al., 2020; Hughes and Avoke, 2010; Buffel et al., 2013). Interdisciplinary scholarship across the humanities, social sciences, urban planning, transport engineering and public health (Carmien et al., 2005), and extensive disability advocacy (Hamraie, 2017; Costanza-Chock, 2020), is directed at ways of understanding and mitigating infrastructural barriers in transport environments towards more equitable ends.

By adopting an integrative and community-based participatory framework, we contribute to this literature in three key ways. Firstly, following our participants' experiences, we present infrastructural features as contextualised in specific places and times. Secondly, we show how alongside people's social and political identities, colonial history shapes the built environment and informs their contemporary experiences of infrastructure, particularly for Indigenous participants. Finally, we explore the role of transport planning decisions in enhancing or undermining aspirations for wellbeing in this context.

As with other countries with 'settler' populations, colonization adds a potent dimension to place-based wellbeing prospects in Aotearoa (Came et al., 2019). Historical social inequities map onto landscapes, shaping person-environment relationships and compounding layers of privilege and health. Even in areas where Māori—the Indigenous peoples of Aotearoa—make up more of the population, inequitably distributed socioeconomic and infrastructural resources counter the benefits of solidarity and social connectedness (Bécares et al., 2013). These inequities are inextricably bound up with ageing, disability and mobility, complicating possibilities for wellbeing in place. Restricted opportunities can relate both to the wellbeing of communities as a whole as well as the experiences of specific individuals within communities.

Relatedly, Indigenous interpretations can influence how we think about places, what it means to be in place, and how we conceive of the 'built' environment and infrastructure. Challenging urban designers to reorient design to embrace Indigenous interpretations of place, Matunga (Matunga, 2000) invites us to imagine walking with a Kai Tahu (a South Island Māori tribe) woman in Christchurch city. We walk with her "up Colombo Street, avoiding the traffic" and "up Hereford Street ...[to] the Otakaroro (Avon River) where her ancestors caught tuna, and where tourists now pay to go punting," and onwards through the town centre, taking paths her ancestors travelled for centuries earlier, "temporally separated but spatially linked" (Larkin, 2013). With this excerpt, Matunga asks readers to imagine this woman's walk a thousand times over throughout the country, to get a sense of "the two histories, and two realities that permeate our cities. One dominating, the other dominated." Aotearoa New Zealand's colonial history means place meanings are symbolically and literally contested, and this haunts wellbeing-in-place in Aotearoa, particularly for Māori.

Māori interpretations of place are also grounded in epistemologies that precede thinking of places as static, fixed sites. These acknowledge the interrelatedness of spirit, person, families, and communities with wider social contexts, histories, ancestors and places. For example, Māori conceptions of health and wellbeing involve a holistic understanding that encapsulates the wellbeing of *tinana* (body), *wairua* (spirit) and *hinengaro* (mental and emotional wellbeing, respectively), with the wellbeing of the individual located within the collective wellbeing of the *whānau* (Durie, 1994, 2001). Conceptions of familial, ancestral and genealogical place-ties are encapsulated by *whakapapa* (lineage of descent, linking to ancestors and other living beings) and *whanaungatanga* (centrality of kinship and responsibility and care for the collective) (Smith, 2004). Responsibilities of mutual care and guardianship are expressed through concepts of *kaitiakitanga* (guardianship and protection of land) and *tūrangawaewae* (a place one stands, and stands for) (Smith, 2004). These conceptions shape Māori experiences of health, place and wellbeing in myriad individual ways (Durie, 1994, 1998), in combination with shared histories of colonization and alienation from land, and diverse orientations to Māori, non-Māori, and capitalist cultural references in contemporary life (Panelli and Tipa, 2007).

In this paper, we draw on Indigenous (Smith, 2004; Matunga, 2000) and critical geographical paradigms (DeMiglio and Williams, 2016; Lefebvre and Nicholson-Smith, 1991) when thinking about place, acknowledging place is always material, relational, historical and interactive. Places also have symbolic meanings, shaped by the layering of lived experiences over time. These understandings resist conceptualizations of place as neutral or static territories which are "straightforwardly empirical, objective and mappable" (Koops and Galić, 2017), and compel us to engage with our participants' experiences of transport infrastructure in more nuanced, contextualised ways.

Our findings reiterate arguments that place-based opportunities for wellbeing shaped by ethnic, raced and classed social dynamics also intersect with capacities affected by disability and ageing. Through engaging with experiences of infrastructure-supported wellbeing and infrastructural abandonment and neglect, we articulate a vision for more inclusive transport infrastructure and policies that enable the wellbeing of people differently challenged by urban environments.

2. Participants, places and methods

Inclusive Streetscapes is a community-based participatory research study exploring links between transport sector decision-making and experiences of health and wellbeing amongst 62 older adults and people living with disability in four Auckland neighbourhoods (Table 1). Community-based participatory methods can assist with decolonizing and de-hierarchisation of Western research paradigms in which researchers are designated as experts and participants as subjects (Koster et al., 2012; Wallerstein and Duran, 2006). This project emphasized collaborative, equitable partnerships with participants in all stages

Table 1

Community participants and their engagement in the Inclusive Streetscapes Project.

Site	Participants	Relationship to interviewer	Journeys
Glen Innes	15 people (12 women, three men); wide range of ethnic groups: Māori (7), European or NZ European (8), Cook Islands (2), Samoan (1) and Niuean (1).	Research assistants worked for a community engagement organization in Glen Innes who worked with University research team in partnership. They recruited participants through their networks, other community organisations, and the local marae.	Most participants took the researchers on journeys by foot/wheelchair/scooter to the Glen Innes town centre. Journeys also included rides in cars (2), trains (2) and bus (1).
Howick	17 people (11 women, six men) including two married couples and a pair of friends interviewed together. 10 identified as NZ European, 8 as Chinese, one as both.	Two research assistants conducted interviews and Chinese translations. Most Chinese participants were friends of one researcher's grandmother. Other participants were recruited through a local church. One participant contacted the research team directly having heard of the project through a friend participating in Glen Innes.	The go-along interviews were largely walks around the local neighbourhood and reserves. One go-along included a bus ride.
Māngere	14 people (12 women, two men). This site centred on a group of kaumātaū (elderly Māori) living in a block of flats opposite Te Paea Marae. Two participants had no direct connection to Te Paea.	Recruitment was largely facilitated through networks (family or neighbours) of a coinvestigator who lived at the kaumātaū flats. Two participants were parents of the research assistant. One participant was recruited through a local disability organization.	Due to logistical challenges presented by this site, only nine journeys were taken, four of which comprised a short walk around the Kaumātaū flats.
West	16 people (nine women, seven men). One participant was neither older nor disabled, but was a community support worker for people with mental illness. All identified with Pacific ethnicities: Samoan (5), Tongan (6), Tuvalu (4), Tokelau (1) and Kiribati (1). Two identified with more than one ethnic group including NZ European (1).	We recruited most participants through community groups. Tuvalu, Tokelau and Kiribati participants all belonged to a Tuvalu community group which meets every week. Most Tongan participants belonged to a Tongan group. This means that our sample mainly consists of people who are able to access at least one community activity. Our R.A. Liz recruited the remaining participants through her personal networks.	Most participants undertook journeys by foot. Four journeys included a car ride. Most journeys traced the participant's usual daily walk for exercise, to the bus stop, to the shops, to school pick-ups, or to the mailbox.

of methods and analysis (Wallerstein et al., 2005), and followed participants' lead in defining research questions and key terms. Interviews were conducted in nine languages (Te Reo Māori, English, Samoan, Tongan, Tuvaluan, Tokelauan, Kiribati, Mandarin and Cantonese) by research assistants each of whom were from the communities approached. The study was approved by the institutional ethics review committee and all participants provided written informed consent.

Participants were generally older and there is a range of mobility among them: from able to walk and drive fairly comfortably, through various amounts of supported mobility (including canes and manual wheelchairs to electric mobility scooters), to not being able to move further than their front door or letterbox (see Table 1 for how these ranged by site). Given the concerns of project team members (of diverse cultural, ethnic, and disciplinarily backgrounds) that the term 'disability' did not always translate linguistically or culturally, we asked about chronic illnesses rather than disabilities when interacting with Pasifika and Chinese communities. Many interviewees referred to "bad" or "weak" limbs rather than specific health conditions when describing their challenges with movement.

Interviews were conducted at home where participants were invited to talk about their everyday mobility-related routines, challenges, pleasures, familial and community supports, and their health. Most interviews also incorporated a go-along component (Carpiano, 2009; Gardner, 2014) where interviewers accompanied participants on a journey they would usually take (or would like to take), while participants narrated, with prompting, their thoughts while moving about. A few participants declined this component or their limited mobility meant the go-along was a walk to their letterbox. The interviews were complemented with PhotoVoice (Catalani and Minkler, 2010; Palibroda et al., 2009), where participants or research assistants took photos to capture aspects of interest during the journey, for example, infrastructure elements. Discussions regarding images were flagged in recorded interviews.

We systematically coded interview transcripts. The research team identified codes collectively after reviewing selected transcripts, and these codes were test-applied to four randomly selected sample transcripts for consistent application and cultural interpretation. Coding organized the themes and topics raised in interviews: comments about different forms of infrastructure and mobility were grouped, for instance, as was mention of illness, disability, and varied relationships. Coding focusing on mental wellbeing included safety concerns (traffic risks, personal harm, need for vigilance) and perceptions regarding the natural and built environment; bodily and emotional experiences, wellbeing and health (including spiritual connection and exercise as fitness or pleasure).

A strength of this paper's enquiry is that the research did not set out to ask explicitly about people's mental health and wellbeing. The stigma and cultural (and clinical) specificity of such terms may have closed lines of enquiry, or directed it in highly specific ways. Instead, the interviews and interpretation gathered information on emotional and psychological aspects of life enmeshed in participants' everyday experiences. We aimed to be open to the meanings people offered about their sense of health and wellbeing, contexts, and challenges of mobility. This was consistent with our research method of following how participants furnish meanings of mental and emotional wellbeing, rather than imposing or assuming these. Having identified subtle forms of discontent that appeared as a counterpoint to expressions of wellbeing during the first round of analysis, we re-analyzed the interview data focusing on instances of unease, dissonance, stress and distress; solastalgia, nostalgia, and longing; and the ways that people thought about causing trouble to others.

We have arranged our findings to elucidate the multi-layered pleasures and risks, and consequent emotional effects, of distinctly situated bodies interacting with particular places. We were interested in how infrastructural design and materiality informed these experiences. While the interpretations are not intended to be linear, for the purpose of

this paper, we first establish the pleasures of mobility in place, then explore risks of seeking these pleasures in the context of accessibility challenges. Finally, variations in these possibilities are highlighted by comparing two older Māori women's quests to harvest pūhā (sow thistle) and harakeke (flax) bush in two suburbs with distinct built environment histories.

3. Findings

Conceptions of wellbeing came through our participants' accounts in ordinary, lay language: in talk of happiness, worry, apprehension and stress, and exclamations about beauty in the environment (for example of the trees, sky and sea), and expressions of risk, and danger, for example while crossing roads. We focus our analysis and interpretation on emotional experiences, recognizing that these cannot be de-linked from needs, risks and dependencies. Participants' accounts highlighted the mental space occupied by emotional burdens and stresses involved in making journeys, speaking to the overwhelming nature of inaccessibly designed and maintained infrastructure.

Temporal elements were also presented as being important to wellbeing: Glen Innes participants talked of fond memories of participating in gatherings at the pub, and kaumātua at Te Puea recalled the previous abundance of seafood and edible plants in the area, now degraded by infrastructural devastation. These memories and knowledges informed how people relate to places in the present, shaping their current and prospective wellbeing. We also noticed the importance of attending to senses of being that are fleeting and highly contingent to appreciate people's experiences of wellbeing and place. Introduction of new technologies (e.g., new electronic tickets), changes to bus routes, services that have stopped entirely, or seeing people in wheelchairs get stuck during train rides, open up or close down people's choices.

3.1. Beauty, joy and belonging in place

Interviewees in every site noted the satisfaction of being able to move about and encounter beautiful sights and familiar people. This affected their senses of self. Participants indicated such pleasures in seemingly casual observations while walking. "Oh listen to those birds, aren't they glorious?" said Wendy in Glen Innes; "take a photo of the trees!...oh the trees are absolutely beautiful" said Emily in Māngere; "beautiful, oh, the sun comes out. I think you will get happier after a walk outside" said Yuan in Howick. Mario connected a pleasurable scene to a mental experience: "I see the sea view...it stimulates the brain." He also noted the importance of keeping moving to stay hopeful and open to the circular and contingent opportunities for social encounters and connections. He went out, even when in pain, to prevent depression and isolation:

"The problem is many things can happen that you fall into loneliness. If you don't keep up ... if I give up hope to find a girlfriend, if I give up hope to do this, you know? ... It is not only the traffic and all this, it is the personal ambition and how the state of mind is...Because everything round like how you move, how you behave, develops from this internal consciousness, how is my state of mind"

Participants talked vividly about the difference between going out to do what needs to be done and going out for the joy it brings. Eileen in Glen Innes described how participating in a Cook Island cultural group gave her reason to go out, more than "just to go do shopping and then I'm back behind my four walls." She explained "it was getting me out of the house and not getting locked down all the time. Not that no one was locking me in it, was just that I just didn't want to go, you know." The socialities people desire, and which mobility affords them, may be planned like Eileen's cultural group, or incidental and hoped for, like Mele's encounters with other electrical wheelchair users which were "the happiest time for me...we have coffee...we talk for hours before I come back", and Lose's delight in meeting other Tongan people when out walking. "As always, when we meet and greet each other, we feel

happy," Lose said, "because when we get to go home, we don't see each other anymore. At least something." Lose alludes to the sense of longing or loneliness felt by many while living quietly at home, a feeling mitigated by mobility, even briefly.

This sense of connection to community, more abstractly, may also be about being elsewhere to one's small domestic world physically and sensorially, minimizing focus on one's own discomforts and self, as evident in the impressions of excursions for a coffee shared by a participant with agoraphobia, or another participants' regular visits to browse the material offerings of their local charity shop.

Participants viewed exercise as a source of wellbeing in itself, though the capacity to move through one's environs, for fitness or otherwise, was unevenly distributed. Among Howick participants, Chinese women appeared particularly health-conscious, taking numerous walks (up to three times a day) for exercise, often including the close-by reserves and beaches in their strolls. However, varying health conditions challenged their capacity to do this. Pākehā/NZ European participants in Howick were less likely than the Chinese participants to walk regularly, often due to injury, although several expressed an ambition to walk more. The capacity to walk and enjoy surrounds was also thwarted, noticeably, by place. Participants in the West site valued exercise and good health, much like those in Howick. However, the urban build and topography of their suburb (a hilly, historically industrial area, with several multi-lane arterial main roads, that has been retrofitted as residential over years) posed many challenges to walking in comparison to neighbourhoods in Howick (originally developed as a residential area for retired soldiers and families, and socio-economically better off). Many participants in the West struggled with the slopes and described feelings like "asthmatic to the knees" and "can't catch my breath." Poor quality and obstacles on pavements, and sparsely-distributed and unsafe road crossings, challenged their aspirations to enhance wellbeing through exercise.

For many participants, the pleasures they spoke of—e.g., of nature, company and community—were shadowed by related losses for periods of time. Rain, bodily pain and bouts of illness, hills, poorly maintained footpaths, and lengthy road repairs, were all cited as keeping people from being out and about. Wang, in Howick, described how she no longer visited her friend who lived in the neighbourhood as the bus she used to take to see them changed from a half-hourly service, to an hourly service, then stopped completely.

We heard of infrastructure that completely disrupted people's opportunities for mobility and social participation. In the Māngere site, where most participants lived at the kaumātua flats, a motorway had severed the adjoining road, isolating flat residents and their marae (Indigenous meeting houses and surrounding buildings) from the Māngere township. The flats are only easily accessible by vehicle. Without a vehicle, the kaumātua have two pedestrian options, neither safe. One involves walking alongside a busy highway where frequent crashes occur, while the other involves a metal footbridge that, for people of advanced age, is forbiddingly steep, with gaps between the concrete steps revealing a daunting and disorienting view of the motorway below. There were no bus stops nearby, and only one resident had a car that allowed independent travel between the flats and the rest of the world. One participant savoured her scheduled visits with a community carer, who drove her to doctor's visits and shops; others waited for family members to make time for them. Consequently, for these participants, the ability to access the joys, pleasures and fitness of being mobile were severely curtailed and always contingent.

3.2. Emotional costs, perceived safety and related burdens

Although most participants described and enacted deep desires to be out and about, the emotional costs and mental labors of even ordinary outings was striking, including to research interviewers accompanying participants. For example, to avoid stresses about safety and anxieties around using novel technologies such as pre-paid swipe cards to access

public transport, some participants resorted to more complicated or expensive transport options, or did not go out at all.

Those with restricted mobility offered distressing accounts of the mental energy required to hold and recall detailed geo-local journey information and plan several steps ahead. Eleanor in Glen Innes uses a mobility scooter. She relayed stored details of infrastructural features she is preparing to encounter, or seeking to avoid, on her walks: one severely cracked path which she has “no choice but to go over”; the curbs that get more pronounced further up the street; the risks of wearing out and puncturing her scooter’s tyres when she tries to move between the road and sidewalk to avoid the hedges; cobbled sidewalks in the town centre that however pretty are “rocky” to ride over. She described a shorter route to Glen Innes village that she cannot use because of tree roots warping the sidewalk. People like Eleanor accumulate these micro-details over trips and hold them in mind as they move about, sometimes at great peril. As Rose observed, moving about when disabled requires planning how to negotiate the destination as well as the journey:

“The mental side of it is really exhausting. I can’t just go to a shop and think I’m going to go into that shop. I’ve got to negotiate the parking, finding a park. Then I’ve got to think about is that shop accessible? Can I get into that shop? Then once I’m in that shop I’ve got to think can I move around this shop? Can I reach the things on the shelf?...it’s mentally tiring.”

Negotiating physical dependencies on others required intensive planning. Most interviewees who found themselves dependent on others in new ways reported the emotional and relational strain involved with this adjustment. Small details and connecting steps of a journey were seen to make all the difference to a person’s ability to travel alone. Lester, who uses a wheelchair, talked about how journeying independently between where he lives and a shopping mall is inhibited by the broad gap between the train and the platform at the station at one end and the “huge lip...like a step or a curb [to] go over” between the platform and the train at the other. To avoid getting stuck in the gap or tip over on the step, he needed someone else to push him at both ends. Lester recalled seeing people on wheeled-devices get trapped in the gap, and having to call on train attendants or rely on other commuters to help him. Like many of our participants, he disliked this forced reliance on others—especially strangers. Participants talked about only accepting rides and help if they were “desperate,” preferring to walk or move about alone to avoid making others wait for them, and preferring not to trouble their busy adult children for rides, even in highly supportive families. They spoke of letting trains or buses ‘go by’ during busy periods to avoid inconveniencing other commuters with their relatively slower embarks and disembarks. While emotions like shame and guilt were not explicitly named in relation to asking for help, the aversion was obvious. Many interviewees touted independence as an ideal, and disliked the heightened dependencies on others due to transport infrastructure and accessibility oversights—even if located at just one of a journey’s many points.

3.3. Safety as a matter of emotional wellbeing

Even for those who could move around unaided, inaccessible or poorly maintained infrastructure demanded a highly focused and stressful kind of self-reliance in pursuit of what is valuable about getting around. A few times on Eleanor’s walk, she expressed herself as “taking my life into my own hands” when navigating her mobility scooter on the narrow path running alongside a highway and negotiating overgrown hedges that compelled her off the sidewalk and onto the road for stretches of her walk. These moments made her feel “very apprehensive” and “wary,” and at one point she halted the interview to focus on how she might get back on the footpath. “Now I have to look a bit carefully,” she said. The interviewer alerted her to a car just behind her, and she replied “Not so much the car. Looking for a safe curb I can go up and

back up onto the footpath with because some of them are quite large here.”

Soft and hard structural barriers prompted many participants off the footpath and onto the road as they walked. These included obstructions to public footpaths, overhanging tree branches, and cars carelessly parked in driveways. In the absence of concreted sidewalks on one side of the road near where Moana lived in West Auckland, she was forced to walk in the ditch to avoid the buses which she dreaded. Cracks in the pavement that were not repaired by local councils were commonly remarked upon in Glen Innes and in the West. Participants saw it as choosing between the fear of tipping over or getting stuck in a cracked path, and the fear of venturing off the path onto the generally smoother surface of the road and being struck by a vehicle.

Competing with traffic, distrust of drivers, and infrastructural features (like hedges near roundabout crossings that blocked visibility and access) meant participants put extra effort “to be safe and to be seen”, bearing in mind that “motorists are ... not looking for children, they’re not looking for someone in a wheelchair.” Ruru in the West talked about crossing a busy road, where she is “confronted with cars that are parked on the side of the road and you have to keep creeping out just to get visual contact with the traffic that’s coming to your right. And I tell you,” she added, “sometimes, it’s bad.” As revealed in go-along interviews, crossing roads were especially stressful experiences in the West where busy, wide, high-speed roads had few pedestrian crossings, spaced far apart. “It’s just like a cat running across the road,” Ruru said, laughing, “you think, gotta go now!” Francine described how the stress of crossing the road without a crossing on the journey to the hospital shot her blood pressure readings “sky high,” and the doctors “do not realise, it’s all the stress of getting [to the hospital].”

Some participants, like Francine and Ruru, absorbed the mental strain imposed by these challenges in their determination to go about their lives somehow. But for many others, especially women participants in the West, fears and anxieties around traffic and personal safety meant they made few journeys, exercised great caution doing so, or did not go out.

3.4. Pūhā, harakeke and histories of place

In this section, we draw on the study findings to investigate how experiences of joy, delight, belonging, mobility and wellbeing (at each end of the spectrum of possibility) are mediated not just by the characteristics of local infrastructure—gaps on trains, cracked sidewalks—but also by infrastructural histories of places. We illustrate this with a closer study of two older Māori women’s attempts to gather plants in Glen Innes and Māngere.

Both these sites are historically lower-income working-class suburbs that are ethnically diverse, and have longstanding Māori community presence and local marae. However, they have quite different built histories. By the late 1950’s, Glen Innes was developed for Māori who were displaced from housing in a nearby suburb and for returning veterans. Alongside housing, the development included a town centre featuring a network of shops and amenities, a marae, and proximity to the moana (sea). The local marae is inclusive of different cultures, and provided substantial support for study participants connected to it. Glen Innes participants appreciated their connections to the shops, amenities and local community. For many who had lived in the area most of their lives, local sites like the pub and the McDonalds were steeped with warm memories of community gatherings. To live in and be able to move around places to which they expressed enduring attachments inspired fond and nostalgic reflections amongst our interviewees. At the time of the research, rapid (and contested) infrastructural regeneration in Glen Innes affected some participants’ mobility, and many anticipated being displaced by the apparent gentrification. Yet the possibility for collective protest protecting ongoing connections was evident in the energy in this community, and the built environment was discernibly conducive to people gathering *visibly* to discuss their misgivings.

Māngere is a suburb where road infrastructure, rather than suburban infrastructure, has been prioritized in past decades, particularly in the community surrounding Te Paea marae—the small area of Māngere on which this study focuses. In the 1970s, State Highway 20 was erected across this end of Māngere to facilitate travel to Auckland's international airport. It has been expanded several times since. Almost all Māngere participants lamented losing access to places of cultural significance and unwelcome exposure to increased traffic, noting how this has affected air quality, polluted the ocean, local soils and plant-life.

Unlike participants who described enjoying trees, bush and natural scenes in other sites, certain foliage in Māngere prompts emotional dissonance for at least two participants. They recalled that during the motorway development (which was contested by members of the marae), their elders requested that council landscapers plant native trees. "They plant[ed] their own [exotic] trees," one participant explained, "not the trees we would like planted... [I remember] our kaumātua at that time ... saying no, do not plant those because, we won't be able to see the moana. Well it's happening now you know.... [the trees are] all overgrown now... and it just cuts off that access for [kaumātua] to see the beautiful moana." Besides blocking a view, these trees are a material and symbolic slight. They recreate access barriers as their low hanging branches block the footpath. And they symbolize histories of disrespect, of eroded rights and autonomy over the whenua (land), and of being unheard; injustices that are echoed throughout this site.

Significantly, the motorway has also isolated the kaumātua living in the flats affiliated with the local marae, that is, the community this project engaged with. Many of our participants remained deeply invested and engaged in continuing the work of their tūpuna (ancestors) who protested the motorway build, despite their ongoing feeling that their experiences are unseen and unheard by those who could possibly address these.

These differing historical conditions of Māngere and Glen Innes inform capacities for belonging, joy and wairua for both Whaea Grace in Glen Innes and Whaea Pania in Māngere as they discuss collecting pūhā (a perennial sow thistle) and harakeke (a weavable flax with medicinal properties) on their walks.

Whaea Grace, a Māori woman in her late 50s, has some difficulty walking but walks a lot as she works at the local marae almost every day. She took the interviewer on one of her regular routes looping through a reserve between the marae and back to her home. She mentioned, shortly after they were inside the reserve gates, that there are sometimes pūhā, harakeke and other edible plants in the bush. "You can see them growing up along the sides," she said. "Roundabout this time of the season I like coming down this way. A lot of the time with my eyes scanning along the edge of the harakeke, because there's something in there that is so yummy...it's a good time when the rain comes up, the pūhā comes out you see?... you'll see a lot of them, so you know, a good menu will start popping up in your head on the way home...buy some meat and then you pick it on the way up." There is a sense of coherence and deep, simple pleasure about the harmonies that Whaea Grace describes here; of a movement between places that matter to her—home and the marae—and the satisfaction of other needs as she walks; a good meal she begins to imagine and prepares for. She described moving from the fast pace of life into the reserve and how "it slows you down," allowing you to "appreciate a lot of things." She noted the need to be careful about whether "Māori kai (food)" has been treated with chemicals and pesticides. "In the eyes of the council it's about keeping it tidy without realising what they are doing." However the abundance of pūhā in her area, in the reserve and sometimes growing wild on her property, reassured her. Despite concerns about the safety of wild-growing pūhā and the different conceptions of council staff, she was heartened by her observations.

The ease and enjoyment that Whaea Grace described in Glen Innes depart strikingly and poignantly from the frustrations and difficulties that Whaea Pania experiences trying to harvest harakeke in Māngere. The lack of personal and traffic safety in Māngere drives home the sig-

nificance of the infrastructural problem. Whaea Pania, a Māori woman in her early 70s, lives at the kaumātua flats at Te Paea marae. Compounding her difficulties with mobility in general, she finds walking around Māngere from her home especially harrowing: the motorway is "right there" and "the traffic is just ongoing." Māngere had not always been this way. Whaea Pania described a time when a part of the area now overtaken by "houses...containers and factories," was "all trees that I could go and get my pinecones and my firewood and even my pūhā." Whaea Pania chose a route to a street nearby for her go-along interview to show the researchers where she would like to cross to collect harakeke. Hardly anybody in the flats and around the marae uses the pedestrian footbridge that would let them cross the motorway. As Whaea Pania said "some would say oh it's only a little road. But it's more than that." She described getting to the bridge and hearing it before she sees it. "It's the noise of the traffic up there on that bridge that made me think this is not safe." Pointing out a big ditch and a dented barrier on the left side, she shared her thoughts on how this happened: "The car's just come, try to, probably beat the lights, and gone straight across into that ditch." Crossing under the bridge, a desolate area, she worries for her personal safety. Yet it is past there and across the road that harakeke grows. "And, that's another factor," she said. "How am I going to get my harakeke from there, across the road, back to here? Even though we got harakeke here, I do not really like going out the back of people's houses now they've been sort of cut off by, the fences... I get this funny feeling that I shouldn't be doing that." The only occasion Whaea Pania had chosen to collect harakeke from here was close to midnight, when the traffic was less. On another occasion, many years earlier, when she tried to collect it from a more desolate spot, she recalled dropping her bundle and running to her car when she noticed a man crouching suspiciously nearby. She frequents more crowded places since then. The scenes Whaea Pania took her interviewer through, whether remembered, imagined, or in the moment, are full of danger, risk and frustrated attempts to collect harakeke. These speak of an area severely fragmented by infrastructural decision-making, favouring high speed motor vehicle travel around which spaces for pedestrian mobility (and therefore harvesting and wellbeing) are barely useable, desolate and dangerous.

4. Discussion

Transport infrastructure has capacity to bring people into, and to withhold people from, experiences of beauty, joy and community with attendant implications for health and wellbeing. From the perspective of communities, wellbeing is experienced and expressed through varied, complex, nuanced and oblique ways. These community-grounded ways of describing wellbeing are highly socially and materially contextual.

While we illustrate study findings focusing on particular travel segments, participants' accounts speak powerfully to the importance of the journey as a whole when considering access to mobility and wellbeing. Charting study participants' experiences establishes what is at stake for them, what they risk their safety and comfort to pursue, and what they potentially lose, through changed circumstances, or have already lost due to historical and contemporary changes and disruptions in transport infrastructure.

By approaching wellbeing and the relationships between wellbeing and infrastructure from the ground up, we find ourselves positioned to address the question of where state and transport sector responsibilities for mobility-related wellbeing lie.

Firstly, our findings highlight the interactions between people's efforts to pursue wellbeing and the infrastructure they encounter when doing so, demonstrating how their choices are shaped by the built environment and transport services. Variations in the experiences of study participants living in the four sites vividly illustrate the importance of potentially alterable features in the built environment, such as safety, accessibility, and wayfinding (Lawton, 1999). Good environmental design can facilitate exercise, social connectivity, or exposure to novel and

stimulating experiences. We observed this in descriptions shared by participants in Glen Innes and Howick even when they encountered challenges exacerbated by health conditions (recall Mario's excursions to local shops inspite of physical pain, and Whaea Grace's enjoyment of wild puha on her walk despite mobility constraints). However, the built environment can also create negative stimulation such as feelings of risk, and when these are excessive, as amongst West participants whose walks were filled with traffic risk, stress occurs. This environment undermines and constrains people's mobility-aspirations and agency. There is little environmental resilience or accommodation in the West's built landscape, and even less around Te Paea Marae flats. Participants in these sites belonged to groups at increased risk of chronic diseases in Aotearoa, and as noted by other scholars (Raerino et al., 2013), their wellbeing is further jeopardised by reduced access to physical activity and health care.

Secondly, by avoiding a deficit approach to people's experiences, our analysis identified how poorly connected pedestrian infrastructure results in concerns about safety that lead participants to take on onerous risks and stresses when moving around, or avoid journeys altogether. While safety is often conceptualised in the transport sector in terms of mitigating risks of injury, these findings demonstrate how a range of issues – both personal and environmental – change perceptions of risk and generate safety concerns that may go unseen by people without mobility impairments, including transport professionals. Yet these 'unseen' obstacles in transport infrastructure trouble people living with disability and older adults even on routine walks. This emphasises the need to shift from approaches focusing primarily on individuals avoiding risks of injuries to one appraising and remediating features of built environments that create highly burdensome risks in ableist societies.

We present these quashed capacities for fluid mobility that constrain wellbeing in some sites, especially in the vicinity of Te Paea marae in Māngere, as symptoms of infrastructural neglect. Failing to address these is an abandonment by the transport sector of people in these neighbourhoods. Within a Māori worldview, the health and wellbeing of the individual is located within the collective wellbeing of their whānau and the environment they are connected to (Willing et al., 2020). This connection to the land, waterways and ocean of their ancestors is intrinsic to their own wellbeing and the way in which the built environment restricts or supports this connection for Māori communities requires attention. By understanding and prioritising Māori values such as *whānau*, *whakapapa* and *kaitiakitanga*, and place-sensitive understandings of wellbeing (Panelli and Tipa, 2007), there is potential to create built environments and transport systems that increase collective wellbeing while also upholding the mana of the *whenua* itself. This aspiration speaks to a much more comprehensive conceptualisation of wellbeing and sense of place within a Māori worldview and has the potential to support the development of infrastructure and community spaces where wellbeing can flourish more generally.

This study was not designed to investigate causality or quantify associations between infrastructure and wellbeing. Rather, we explored how people's mobility was enabled by the built environment, and what that mobility allowed them to experience. We positioned transport planning in a historical context, identifying possibilities for connection, place-attachment, certainty and coherence that the specific contexts allowed people to develop (or not). These elaborations offer scaffolding and language for imagining transport systems that support caring, nurturing, inclusive mobility and wellbeing for people differently challenged by built environments. Our findings emphasise the value of attending to how experiences are created between people and places in transport planning, and demonstrate methods by which those who feel unseen and unheard can be listened to. By advocating for infrastructural reform, we do not imply that it is feasible to ensure that all people in all places can experience optimal comfort levels at all times. However, our research demonstrates signs of incoherence and dissonance in transport infrastructure that require attention if aspirations for wellbeing and transport equity are to be realised.

Declaration of Competing Interest

None.

Acknowledgments

We gratefully acknowledge the contribution of our study participants, research interviewers, Rākau Tautoko, the study advisory group, and co-investigators in the Inclusive Streetscapes Project (Bridget Burdett, Whaea Dolly Paul, Roshini Peiris-John and Whaea Julie Wade) and the Transport and Mental Health Project (Alistair Woodward and Kirsty Wild).

Funding

This work was funded by the **Health Research Council of New Zealand** [Grant number **16/289**] and **Waka Kotahi NZ Transport Authority** [Grant number **TAR18-09**].

References

- Anand, A., Tiwari, G., 2006. A gendered perspective of the shelter-transport-livelihood link: the case of poor women in Delhi. *Transp. Rev.* 26 (1), 63–80.
- Bécaries, L., Cormack, D., Harris, R., 2013. Ethnic density and area deprivation: neighbourhood effects on Māori health and racial discrimination in Aotearoa/New Zealand. *Soc. Sci. Med.* 88, 76–82.
- Buffel, T., Phillipson, C., Scharf, T., 2013. Experiences of neighbourhood exclusion and inclusion among older people living in deprived inner-city areas in Belgium and England. *Ageing Soc.* 33 (1), 89–109.
- Came, H.A., Herbert, S., McCreanor, T., 2019. Representations of Māori in colonial health policy in Aotearoa from 2006 to 2016: a barrier to the pursuit of health equity. *Crit. Public Health* 1–11. doi:10.1080/09581596.2019.1684641.
- Carmien, S., et al., 2005. Socio-technical environments supporting people with cognitive disabilities using public transportation. *ACM Trans. Comput. Hum. Interact.* 12 (2), 233–262.
- Carpiano, R.M., 2009. Come take a walk with me: the "go-along" interview as a novel method for studying the implications of place for health and well-being. *Health Place* 15 (1), 263–272.
- Catalani, C., Minkler, M., 2010. Photovoice: a review of the literature in health and public health. *Health Educ. Behav.* 37 (3), 424–451.
- Clarke, P., Ailshire, J.A., Lantz, P., 2009. Urban built environments and trajectories of mobility disability: findings from a national sample of community-dwelling American adults (1986–2001). *Soc. Sci. Med.* 69 (6), 964–970.
- Costanza-Chock, S., 2020. *Design Justice: Community-Led Practices to Build the Worlds we Need*. MIT Press.
- DeMiglio, L., Williams, A., 2016. A sense of place, a sense of well-being. In: Williams, A. (Ed.), *Sense of Place, Health and Quality of Life*. Routledge, pp. 35–50 Editor.
- Durie, M., 1994. *Whaiora Maori Health Development*, 2nd ed. Oxford University Press, Oxford Vol..
- Durie, M., 1998. *Te Mana, Te Kāwanatanga: The Politics of Māori Self-Determination*. Oxford University Press, Auckland, NZ Politics of Māori self-determination.
- Durie, M., 2001. *Mauri Ora: The Dynamics of Māori Health*. Oxford University Press, Oxford.
- Gallagher, B.A.M., 2011. Mobility and access to transport issues as experienced by people with vision impairment living in urban and rural Ireland. *Disabil. Rehabil.* 33 (12), 979–988.
- Gardner, P., 2014. The role of social engagement and identity in community mobility among older adults aging in place. *Disabil. Rehabil.* 36 (15), 1249–1257.
- Graham, S., 2010. When infrastructures fail. In: Graham, S. (Ed.), *Disrupted Cities: When Infrastructure Fails*. Routledge, New York, pp. 1–26 Editor.
- Hamraie, A., 2017. *Building Access: Universal Design and the Politics of Disability*. University of Minnesota Press, Minneapolis.
- Hamraie, A., 2018. Enlivened city: inclusive design, biopolitics, and the philosophy of liveability. *Built Environ.* 44 (1), 77–104.
- Hughes, C., Avoke, S.K., 2010. The elephant in the room: poverty, disability, and employment. *Res. Pract. Persons Severe Disabil.* 35 (1–2), 5–14.
- Imrie, R.F., Wells, P.E., 1993. Disablism, planning, and the built environment. *Environ. Plan. C Gov. Policy* 11 (2), 213–231.
- Jones, A., et al., 2013. Entitlement to concessionary public transport and wellbeing: a qualitative study of young people and older citizens in London, UK. *Soc. Sci. Med.* 91, 202–209.
- Koops, B.J., Galič, M., 2017. Conceptualising space and place: lessons from geography for the debate on privacy in public. In: Timan, T., Newell, B.C., Koops, B.J. (Eds.), *Privacy in Public Space: Conceptual and Regulatory Challenges*. Edward Elgar, Cheltenham, pp. 19–46.
- Koster, R., Baccar, K., Lemelin, R.H., 2012. Moving from research ON, to research WITH and FOR Indigenous communities: a critical reflection on community-based participatory research. *Can. Geogr. Le Géogr. Can.* 56 (2), 195–210.
- Larkin, B., 2013. The Politics and Poetics of Infrastructure. *Annu. Rev. Anthropol.* 42 (1), 327–343.

Lawton, M.P., 1999. Environmental taxonomy: generalizations from research with older adults. In: *Measuring Environment Across the Life Span: Emerging Methods and Concepts*. American Psychological Association, Washington, DC, US, pp. 91–124.

Lefebvre, H., Nicholson-Smith, D., 1991. *The Production of Space*, 142. Blackwell, Oxford.

Litman, T., 2003. Social inclusion as a transport planning issue in Canada, contribution to the FIA foundation G7 comparison. In: *Proceedings of the European Transport Conference*. Strasbourg, June, Monash University Social Research in Transport (SORT) Clearinghouse, 2003.

Matunga, H.P., 2000. *Urban Ecology, tangata whenua and the colonial city*. In: Stewart, G.L., Ignatieva, M.E. (Eds.), *Urban Biodiversity and Ecology as a Basis for Holistic Planning and Design*. Lincoln University International Centre for Nature Conservation and Wickliffe Press Ltd, Christchurch, pp. 65–71.

Ministry of Transport, 2018. *A Framework For Shaping Our Transport system: Transport outcomes and Mode Neutrality*. Ministry of Transport/Te Manatū Waka, Wellington Editor.

Nordbakke, S., Schwanen, T., 2014. Well-being and mobility: a theoretical framework and literature review focusing on older people. *Mobilities* 9 (1), 104–129.

Nordbakke, S., Schwanen, T., 2015. Transport, unmet activity needs and wellbeing in later life: exploring the links. *Transportation* 42 (6), 1129–1151 (Amst).

Palibroda, B., et al., 2009. *A Practical Guideline to Photovoice: Sharing Pictures, Telling Stories and Changing Communities*. The Prairie Women's Health Centre of Excellence, Manitoba.

Panelli, R., Tipa, G., 2007. Placing well-being: a Māori case study of cultural and environmental specificity. *Ecohealth* 4 (4), 445–460.

Raerino, K., Macmillan, A.K., Jones, R.G., 2013. Indigenous Māori perspectives on urban transport patterns linked to health and wellbeing. *Health Place* 23, 54–62.

Schwanen, T., Nixon, D.V., 2019. Urban infrastructures: four tensions and their effects. In: Schwanen, T., Kempen, R.V. (Eds.), *Handbook of Urban Geography*. Edward Elgar Pub., Northampton, MA, pp. 147–163.

Smith, A., A Māori sense of place? *Taranaki Waiata Tangi and Feelings for Place*. 2004. 60(1): p. 12–17.

Spray, J., Witten, W., Wiles, J., Anderson, A., Paul, D., Wade, J., Ameratunga, S., on behalf of the Inclusive Streetscapes Project Team, 2020. Inequitable mobilities: intersections of diversity with urban infrastructure influence mobility, health and well-being. *Cities Health*. doi:10.1080/23748834.2020.1827881.

Tennakoon, V., et al., 2020. Transport equity in Sri Lanka: experiences linked to disability and older age. *J. Transp. Health* 18, 100913.

Wallerstein, N., et al., 2005. *Developing and maintaining partnerships with communities*. In: Israel, B.A. (Ed.), *Methods in Community-Based Participatory Research for Health*. Jossey-Bass, San Francisco, CA, pp. 31–51 Editor.

Wallerstein, N., Duran, B., 2006. Using community-based participatory research to address health disparities. *Health Promot. Pract.* 7 (3), 312–323.

Willing, E., et al., Indigenous voices on measuring and valuing health states. 2020. 16(1): p. 3–9.

Winner, L., 1980. Do artifacts have politics? *Daedalus* 121–136.