Experience of Disabled Aucklanders in Medium Density Housing

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November 2025

Technical Report 2025/31

aucklandcouncil.govt.nz

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ISSN 2230-4525 (Print)
ISSN 2230-4533 (Online)

ISBN 978-1-991415-07-3 (Pdf)

The Peer Review Panel reviewed this report Review completed on 25 August 2025 Reviewed by Dr Nidhi Nautiyal and Dr Trudie Cain
Approved for Auckland Council publication by: Name: Nicole Miller Position: Team Leader Urban Design and Landscape Strategy, Urban Design Name: Lisa Dunshea Position: Manager Urban Design, Urban Design
Date: 19 November 2025

Recommended citation
Copeland, E., A. Hogan, S. Lee, K. Ovenden (2025). Experience of disabled Aucklanders in medium density housing. Auckland Council technical report, TR2025/31

Acknowledgements

This study required the combined skills and knowledge of many people. The authors would like to thank all the survey participants for their time and consideration in completing the survey. To the 10 households who also participated in the in-home immersions, we are very grateful that you shared your experiences of being disabled in medium density housing with us. We greatly appreciate your candid and honest responses to a range of questions and opened your homes to us as interviewers, both verbally and pictorially. We appreciate each and every one of you who participated. We also appreciate the family members who chose to share their experiences with us, as this added invaluable context to the experience in medium density housing for the whānau as a whole.

We would also like to thank the peer reviewers Dr Trudie Cain and Dr Nidhi Nautiyal for taking time to review this report and providing constructive feedback. We are also grateful to Lillian Zhao for graphic design throughout this document and contributions to chapter one.

We would like to thank Auckland Council's Disability Advisory Panel for endorsing this research and to their valuable input with respect to participant recruitment.

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Executive summary

Context

This study focuses on disabled people and their whānau's experience of medium density housing (MDH) and builds upon the broader investigation by Auckland Council into how Aucklanders are living in recently built MDH (Ovenden & McKelvie, 2024). MDH in this research includes duplexes, terraced housing, and apartments up to six storeys in height and consented after 2016. Three key factors necessitated undertaking this research. The first is the rapid change from standalone housing to MDH in Auckland with terraced and attached housing accounting for 62 per cent of new building consents in 2024. Secondly, the growing population of disabled people in Auckland. As of 2023, an estimated 242,000 disabled people lived in Auckland[1], with a range of disabilities including: physical, sensory, neurological, cognitive, and long-term mental health conditions. As the population ages, it is anticipated that there will be a growing number of disabled people. Finally, there has been little research to date in New Zealand regarding disabled people's day-to-day lived experiences in MDH. Whilst a range of barriers in standalone housing are reported in the literature, it is not known what factors in MDH promote independence and wellbeing and which factors are barriers to living in the homes over the longer term.

Method

The research employed a qualitative methodology with semi structured, open-ended and in-depth interviews to gain insights of the perspective and lived experiences of disabled Aucklanders residing in MDH. The following methods were employed:

- Recruitment of 17 participants across 10 households, representing a range of disabilities, housing typologies, geographic areas, household compositions, and ethnicities.
- Review and analysis of architectural and landscape plans for each participant's home.
- Two hour semi-structured in-home immersions[2].
- Post-visit researcher reflections and transcription of interviews.
- Workshops to identify key themes on how the design of MDH supports or constrains the daily lives of disabled people and their whānau.

[1] Source: https://figure.nz/chart/Zqs5o7SfX9MX33pl
[2] In-home immersions are a research technique that draws from ethnographic methods of active participant observation and participant led interviewing.

Participants and data collection

The participants of this research included a diverse range of disabled people living in MDH across Auckland. They lived with a range of long-term impairments, including physical (agility and mobility), sensory (vision and hearing), neurodivergence (Autism and ADHD), and mental health conditions.

Many households included more than one person with a disability or people with complex needs. The participant group included people from a range of ethnic backgrounds including Cook Island Māori, Pasifika, Filipino, Brazilian, and New Zealand European, ranging in age from under 5 to over 80 years.

Their homes were located across North, South, West, and Central Auckland, and included one duplex, six terraced houses, and three apartments. Seven participants owned their home, two homes were owned by family members that did not live at the home, and one household was renting.

The collated data from the interviews included sharing by the participants on household circumstances and housing expectations, the nature of disability of participants and their everyday occupations, and the need and agency to make changes to their home environments. The commonly occurring themes are organised and presented as key findings in three main chapters.

Key findings

This study found that the suitability of housing typologies for disabled participants and their whānau varied considerably, with some designs offering greater accessibility and adaptability than others. Overall, apartments work particularly well for disabled people when all rooms are on a single level, with an accessible route to the apartment. In general, two and particularly three-storey townhouses posed challenges for disabled participants and their whānau. Some challenges were anticipated prior to moving in, while the rest became apparent post occupancy over time. This indicates that MDH design must adapt to changing needs and abilities to enable tenure stability for disabled people.

The findings also revealed that disabled people complete all occupations including self-care, productive work, exercise and leisure within their home environment. This is partly because their home may be the safest and most accessible place, and partly because of difficulties associated with travel or decreased accessibility in the community. Since Covid-19, there has also been a considerable shift for disabled people to spend more time within their home environment, whether working or socialising. As a result, the need for the home to function well across these various occupations has become more acute.

Finally, the findings reveal, disability is not static but changes over time. Most MDH dwellings studied had undergone considerable modifications of varying levels to adapt dwellings to user needs. This indicates that embedding basic accessibility and flexibility at the design stage is essential to decrease the need for modifications and subsequent financial and displacement burden on households. Doing so enables the disabled person and their whānau to stay within their home, with established social and community connections and preserve it long-term.

1 Introduction

Given the growing disabled population, the changing housing typologies, and additional complexity faced by disabled people with housing, this specialised study was undertaken to evidence the day-to-day experiences of disabled Aucklanders living in recently built MDH so that future MDH can better meet their, as well as their whānau's, housing needs. This study follows on from the *Life in Medium Density Housing in Tāmaki Makaurau / Auckland* study[3] published in 2024 which investigated how well MDH are meeting the day-to-day needs of Auckland households.

1.1 Conceptualising disability

Disability was initially understood through a medical paradigm, which defined it as an impairment in body functions or structures, a biological condition (Haegele & Hodge, 2016). This perspective of disability characterises a person with disease, trauma, or other health conditions as requiring medical treatment (WHO, 2002). Ageing is also a factor in disability, as it is closely linked to the increased risks of impairment and chronic illness over time (Backhausen et al., 2023; Ramadhani & Rogers, 2022).

While the medical model of disability focuses on impairments of an individual, the social model of disability views disability as a problem created by society rather than the individual. It is shaped by how people interact with their environment (Morris, 2001; WHO, 2024). "Disability is in society, not in me" (Ministry of Health, 2001, p.9). The social model highlights how inaccessible environments limit disabled people's ability to participate fully in everyday life (WHO, 2022). The model emphasises driving change at the societal level, including understanding and prioritising the personal experiences of disabled people and recognising them as experts on their own lives and needs (Hickey, 2024). Disabled people, however, have often been excluded from decisions about how buildings and spaces are designed, even though these decisions significantly affect their daily lives (Imrie & Kumar, 1998). This exclusion stems largely from the persistence of the medical model perspective, which obscures the complex social and political phenomenon of disability (Titchkosky, 2011). In this report, the term 'disabled people' is adopted to reflect the social model of disability, which views exclusion on the basis of ableist attitudes, systems, and infrastructure (Ministry of Social Development, 2016; Stafford et al., 2022).

The social model of disability is used to frame disability for this study:

- The experience of disability is varied between individuals; disability-related factors influence perceptions, needs, and ability to live the kind of life that is meaningful to them (Imrie & Kumar 1998; Lutz & Bowers, 2005). Two people with the same diagnosis can have vastly

[3] Detailed results of the original study can be found in the reports titled *Life in Medium Density Housing in Tāmaki Makaurau / Auckland* and *Life in Medium Density Housing in Tāmaki Makaurau / Auckland: Making it work*. Available at: https://knowledgeauckland.org.nz/publications/life-in-medium-density-housing-in-tamaki-makaurau-auckland-summary/ and https://knowledgeauckland.org.nz/publications/medium-density-housing-in-tamaki-makaurau-auckland-making-it-work/

different experiences and needs within a household. It is common for disabled people and their whānau to have co-occurring conditions such as chronic pain, fatigue, sensory sensitivities, or mental health challenges (Stanley et al., 2018). These intersecting factors often lead to complex housing needs over time.

- Disabled people share the same everyday needs and experiences as anyone else (WHO, 2024 Morris, 2001; Shakespeare, 2000). The focus of this study is on experiences that are unique to disabled people.
- Disability can be unpredictable; it can fluctuate or change over time. There can be changes due to a person's condition, as well as changing social factors and aspects of the physical environment (Backhausen et al., 2023). This unpredictability can significantly impact a person's life, disrupting the ability to plan, build routines, and anticipate future needs (Disability Resource Centre, 2010).
- Disability is experienced by disabled individuals and other members of their household. Household members can be affected by modifications to the home, as well as their relationship with the disabled person(s) such as providing care and assistance. This study is therefore focused on the experience of disabled people and the people they live with in their household.

1.2 The disabled population in Auckland and associated housing trends

This section introduces Auckland's disabled population with comparisons to New Zealand's disabled population where appropriate. Tāmaki Makaurau / Auckland is experiencing both population growth and ageing, trends that are expected to contribute to an increasing proportion of Aucklanders living with disabilities. A growing population living with a long-term disability are progressively choosing to remain living at home (Davey, 2006; De Jonge, Jones, Phillips, & Chung, 2011; Smellie & Robertson, 2019).

1.2.1 Population data

The Statistics New Zealand Household Disability Survey (HDS) provides official statistics on disability prevalence[4]. In 2023, an estimated 14 per cent of people living in a household in the Auckland region were disabled[5] compared to 17 per cent of people living in New Zealand households[6]

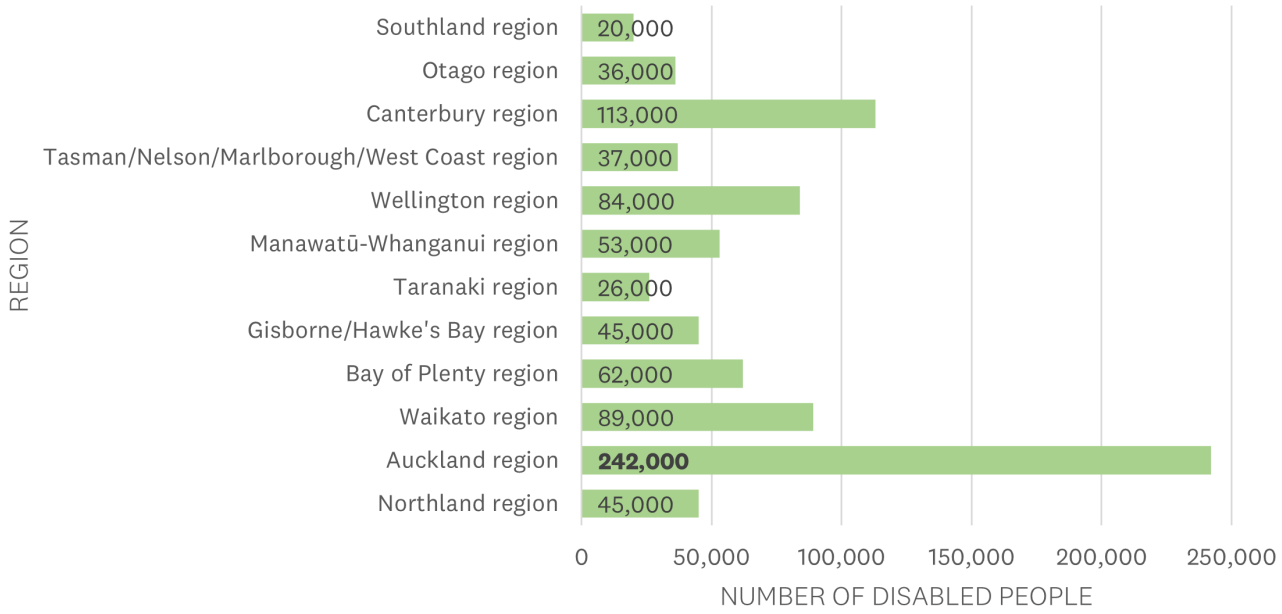
[4] Estimates from the 2023 HDS cannot be compared with estimates from previous disability surveys run by Stats NZ due to changes in the way disabled people were defined. The threshold at which a person was counted as disabled was effectively set higher in 2023 than in previous surveys. See the Household Disability Survey 2023 -findings, definition and design summary for more details: https://www.stats.govt.nz/assets/Reports/Household-Disability-Survey-2023-findings-definitions-and-design-summary/Download-data/household-disability-survey-2023-findings-definitions-and-design-summary.pdf

[5] Source: 2023 Household Disability Survey (HDS). A disabled person in this survey is a person with a self-reported (or caregiver-reported for children) long-term difficulty in at least one of the functional domains for their age-group. Where answer options are scaled, the amount of difficulty reported needs to meet a specified threshold.

[6] Note: 'Households' refers to people who live alone or with others in either private dwellings or community-based residential care facilities (these are living arrangements where people are supported to live in the community). The survey did not survey people living in aged-care facilities and long-stay hospitals or in other non-private dwellings (e.g. hotels, university halls, and prisons).

(See Figure 1). Whilst a smaller percentage compared to other regions, due to Auckland's size as the largest region by population, this equates to approximately 242,000 disabled people living in Auckland.[7]

Figure 1: Number of disabled people in New Zealand

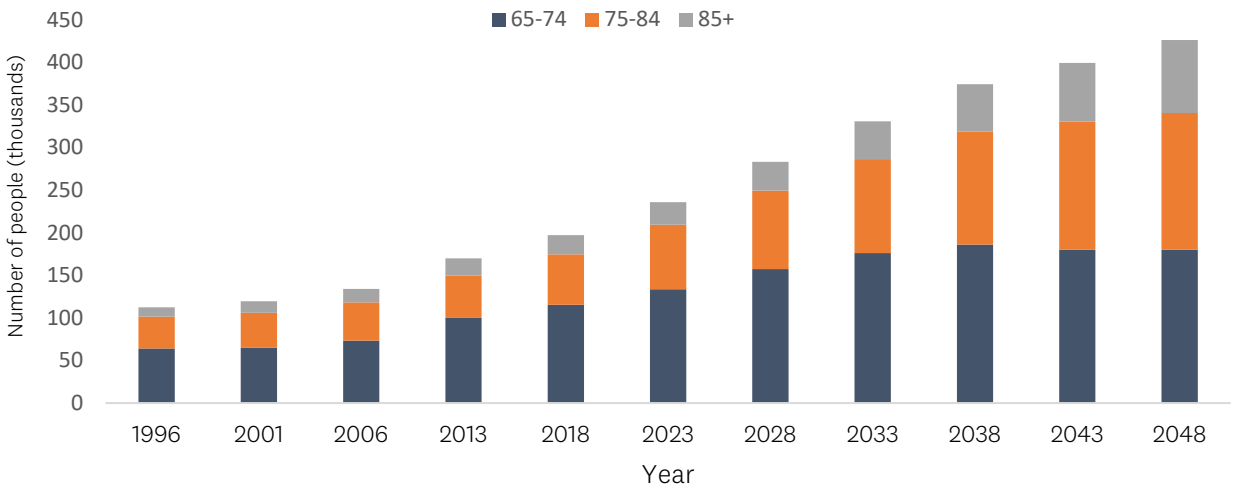


Data sourced from: Stats NZ Household Disability Survey: Estimates of disability prevalence – updated 2023.

The rate of disability increases with age. Twelve per cent of people aged 15-44 years in Aotearoa New Zealand identified as disabled in 2023, 17 per cent of people aged 45-64 years, and 35 per cent of people aged 65 years and over[8]. The Auckland population is rapidly aging which is associated with an increase in disability rate. As Figure 2 shows, the number of people in Auckland aged 65 years and over has increased since 1996 (112,300 people) and is projected to nearly quadruple to reach 426,100 people by 2048.

[7] Source: https://figure.nz/chart/Zqs5o7SfX9MX33pl
[8] Source: 2023 Household Disability Survey (HDS).

Figure 2: Population estimates and projections for Auckland region, by age bracket for those age 65 years and over

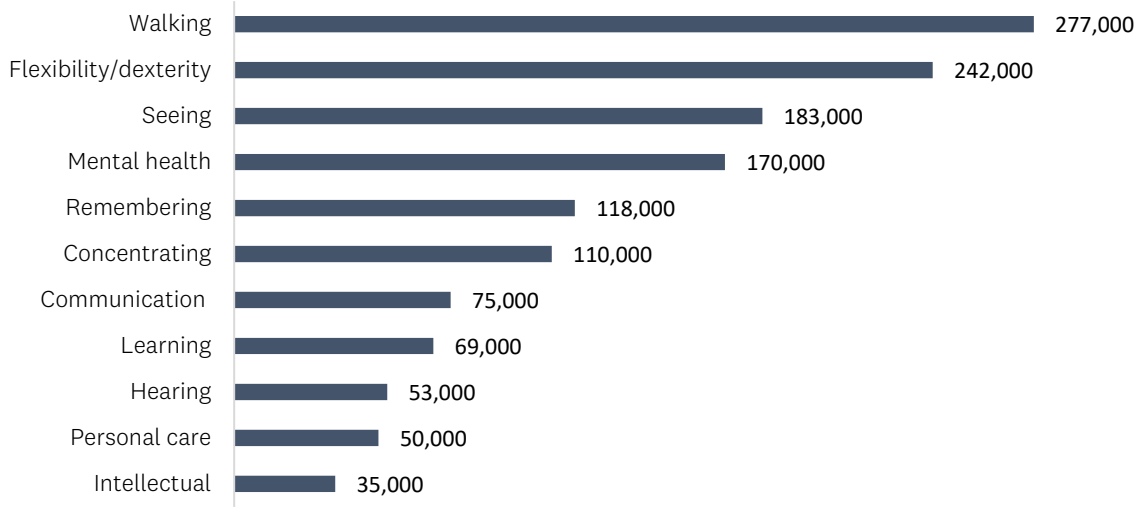


Source: Stats NZ subnational population estimates at 30 June 1996-2013 and subnational population projections, 2018 (base)-2048 update published in 2022.

There are a range of impairments experienced by people in New Zealand. The HDS assesses aspects of human functioning, classified into 'functional domains' such as walking and seeing etc, as part of the method of defining disabled people. The most cited domain was walking (277,000 or 6%), followed by flexibility/dexterity (242,000 or 5%) (see Figure 3).

Disability rates for the functional domains are different for adults and children (under 15 years) in New Zealand. Walking (7%) and flexibility/dexterity (6%) have the highest rates for adults, whereas mental health (5%) and accepting change to routine (5%) have the highest rates for children.

Figure 3: Number of disabled people in New Zealand in each functional domain (2023)



Source: Household Disability Survey 2023 (https://www.stats.govt.nz/information-releases/disability-statistics-2023/)
Note: Chart shows only functional domains for both adults and children. Functional domains assessed for only adults or only children are excluded from the chart.

Nearly Half (46%) of disabled people in Auckland and half of (49%) disabled people in New Zealand experience difficulty in more than one functional domain. This proportion is consistent across age

groups with 48 per cent of those aged 15-44 years, 47 per cent of those aged 45-64 years, and 52 per cent of those aged 65 years and over report experiencing difficulty in more than one domain.

1.2.2 Housing data

In Auckland, the differences in housing tenure by disability status are greater compared with New Zealand overall according to the 2023 census. Only 43 per cent of disabled people in Auckland are living in a dwelling that is owned or partly owned, compared with 50 per cent of non-disabled people. Nearly half (48%) of disabled people are living in a dwelling not owned (i.e. renting) or held in a family trust compared with 38 per cent of non-disabled people.

Since the Auckland Unitary Plan became operative in part in 2016, Auckland has seen a shift in the typologies of new housing with an increase in medium density typologies (i.e. attached houses and apartments) and a relative decrease in low density standalone homes. In the year ending November 2024, 62% of new dwellings consented were townhouses or other types of attached dwellings (Auckland Council, 2025).

The HDS collects information about housing quality, including the size of the home, general condition, and issues such as dampness and mould. Overall, disabled people are reporting poorer housing quality. A smaller proportion of disabled people in New Zealand (7%) compared with 82 per cent of non-disabled people report their home is the right size for their household. A larger proportion (24%) of disabled people report their homes need major repairs or maintenance (14% of non-disabled people), and a larger proportion (9%) of disabled people report their home is in 'poor or very poor' condition (4% of non-disabled people).

This section showed that 14 per cent of the Auckland population living in households were classified as disabled in 2023, and this proportion is anticipated to increase as Auckland's population ages. Disabled people have slightly lower rates of home ownership, which can limit their capacity to make modifications to their homes, and higher rates of low housing quality.

1.3 Legislative context, non-statutory guidance and home modifications

Aotearoa New Zealand does not have overarching disability or accessibility legislation to direct accessible building standards (New Zealand Disability Support Network, 2022; New Zealand Legislation, 2024). Instead, accessible housing is dependent on adherence to non-statutory design guidelines and government or self-funding to modify homes. Other comparable nations have legislation which aims to protect the rights of disabled people by prohibiting discrimination and promoting equal access and opportunities such as the Americans with Disabilities Act 1990, Australia's Disability Discrimination Act 1992, the United Kingdom's Disability Discrimination Act 1995, or Accessible Canada Act 2019. To improve housing accessibility a range of approaches have been undertaken internationally.

> *'The most common interventions identified in the literature reviewed are legislation, regulation and policy interventions. Various countries have regulations requiring accessibility in new-*

build housing. Those include the United Kingdom, Ireland, Denmark, France, the Netherlands, Norway, Sweden, Japan, the United States of America, and since 2022, Australia. Mandatory requirements are diverse across jurisdictions, spanning a range of accessibility standards and varying in coverage of housing types and tenures.' (James, Saville-Smith & Fraser, 2024, p.i)

Legislation pertaining to housing in New Zealand includes the Resource Management Act 1991, the Building Act 2004 and the Building Code[9]. Accessibility of private residential housing, however, is excluded from this legislation. There are some sections within legislation that refer to the needs of disabled people, for example, the Building Act 1991 in its 'Purpose' section 6(2)e refers to the need to provide 'access and facilities for persons with disabilities to and within buildings'. The New Zealand Standard 4121 (Design for access and mobility: Buildings and associated facilities)[10] provides means of compliance with this performance criteria. However, these related performance criteria for a building are mostly publicly accessible and it does not include private housing[11]. Similarly, clause D1-Access Routes of the Building Regulations 1992[12] includes the performance criteria D1.3.2 that states:

'at least one access route shall have features to enable people with disabilities to:

(a) approach the building from the street boundary or, where required to be provided,

(b) have access to the internal space served by the principal access, and

(c) have access to and within those spaces where they may be expected to work or visit, or which contain facilities for personal hygiene as required by Clause G1 Personal hygiene'.

However, again this performance criteria do not apply to private housing.

1.3.1 Housing design guidance

Auckland Council's Auckland Plan 2050[13] has a strategic direction to 'accelerate the construction of quality homes that meet Aucklanders' changing needs and preferences'. This includes homes and developments that are accessible for older people and people with disabilities. With private housing being excluded from national legislation, and no overarching accessibility legislation, the design of accessibility of housing is currently reliant on guidance documents. There is guidance focused on MDH[14] and guidance on designing housing for disabled people. These are outlined below:

[9] See Section 1 Legislation and policy in Chapter 2 Legislation and policy context in *Life in Medium Density Housing in Tāmaki Makaurau / Auckland*: https://knowledgeauckland.org.nz/media/jyhp3rgi/tr2024-06-life-in-mdh-auckland-chapter02-legislation-and-policy-context.pdf
[10] Source: https://www.standards.govt.nz/shop/nzs-41212001
[11] Building Act 2004, Section 118, Schedule 2: https://www.legislation.govt.nz/act/public/2004/0072/latest/dlm309341.html
[12] Source: https://www.legislation.govt.nz/regulation/public/1992/0150/latest/whole.html#DLM164908
[13] Source: https://new.aucklandcouncil.govt.nz/en/plans-policies-bylaws-reports-projects/our-plans-strategies/auckland-plan/homes-places/direction-accelerate-construction-homes-meet-aucklanders-needs.html
[14] See Section 5 Best practice design guidance in Chapter 2 Legislation and policy context in the *Life in Medium Density Housing in Tāmaki Makaurau / Auckland*: https://knowledgeauckland.org.nz/media/jyhp3rgi/tr2024-06-life-in-mdh-auckland-chapter02-legislation-and-policy-context.pdf

- National Medium Density Design Guide (Ministry for the Environment, 2022)[15] has as a principle to 'design houses that provide for day-to-day living of all residents, which incorporates the needs of an ageing population, young children and disabled people (i.e. universal design)'. The guidance states accessible and inclusive design means providing level access, wider doorways, and ground-level living, or provision for stair lifts[16].
- Lifemark independent certification system focuses on five key principles: usability, adaptability, accessibility, safety and lifetime value. All Lifemark certified homes provide: an accessible path and entrance, accessible entry level living with a toilet, and good circulation spaces with wider doorways and corridors. Lifemark was formed in 2008 by CCS Disability Action, a pan disability organisation (established 1935) with its role to work with the construction and design sectors and champion accessible housing.
- The Building Research Association of New Zealand (BRANZ) provides a range of guidance on universal design for housing including: wider accessways and thresholds, level transition zones inside and outside buildings, lever handles, drawers instead of cupboards, task lighting, grab rails in bathrooms, and slip resistant flooring[17].
- The Kāinga Ora Accessibility Policy[18] provides detailed lists of design requirements for different property categories including universal design for new builds and an accessible housing standard for homes purpose built for people with different needs. Kāinga Ora Masterplanning for Universal Design[19] guidance uses universal design to deliver inclusive and well-connected streets, developments and neighbourhoods.
- The New Zealand Green Building Council (NZGBC) Technical Manual[20] includes the LV1 Inclusive Design credit as an optional component of the Green Star Home rating. The aim of this credit is to 'encourage and recognise dwellings that are inclusive, visitable, easily adaptable, and accessible, to meet the changing needs of current and future occupants.'
- The Auckland Design Manual (ADM)[21] offers best practice guidance to support the outcomes sought under the AUP, including for MDH typologies such as terraced dwellings and apartments. The residential design guidance within the ADM includes: minimum floor areas, storage provision, outdoor living space, and thermal comfort, and was used for comparison in this report (Ovenden & McKelvie, 2024).
- The Universal Design Guidelines for Homes in Ireland[22], developed by the Centre for Excellence in Universal Design (CEUD), provide comprehensive best practice guidance for

[15] Source: https://environment.govt.nz/assets/publications/national-medium-density-guide.pdf
[16] https://www.lifemark.co.nz/
[17] Source: https://www.branz.co.nz/universal-design/
[18] Source: https://kaingaora.govt.nz/assets/Tenants-and-communities/Documents/Kainga-Ora-Accessibility-Policy-PDF-FINAL-15.11.19.pdf
[19] Source: https://kaingaora.govt.nz/en_NZ/publications/build-partner-publications/design-guidelines/
[20] Source: https://nzgbc.org.nz/hubfs/HSTG03%20Homestar%20Technical%20Manual%20v5_1_0.pdf?hsLang=en
[21] See: https://www.aucklanddesignmanual.co.nz/
[22] See: https://universaldesign.ie/built-environment/housing/universal-design-guidelines-for-homes-in-ireland

residential buildings. These guidelines focus on all aspects of home design, offering detailed room-by-room specifications that support usability, safety, and adaptability for people of all ages and abilities. The CEUD framework emphasises flexibility, lifetime use, and a user-centred approach to design (CEUD, 2015), making it a valuable reference point for evaluating the accessibility of homes in this study. The CEUD housing guidance includes suggested layouts for semi-detached and terraced housing.

Auckland Council's Auckland Plan 2050[23] has a strategic direction to 'accelerate the construction of quality homes that meet Aucklanders' changing needs and preferences'. This includes homes and developments that are accessible for older people and people with disabilities.

1.3.2 Funding of housing modifications

The lack of comprehensive disability and accessibility legislation in New Zealand is contributing to an undersupply of accessible housing. It is estimated that only five per cent of homes have three key features of accessibility – level paths and entrances, accessible bathroom on the ground floor and wide doorways (Licensed Building Practitioners, 2021). As such, it is common for disabled people to make modifications to their homes (Smellie & Robertson, 2019). The 2023 Statistics NZ Household Disability Survey[24] reported that 12 per cent of all disabled people made accessibility modifications to their home. Making modifications is not possible for all disabled people due to financial constraints (as well as the administrative process of accessing funding), housing design difficulties, and lack of understanding from landlords or real estate agents[25]. The 2013 Statistics NZ Household Disability Survey[26] found that 17 per cent of people with physical impairments have an unmet need for modifications to their homes.

There are three main sources of funding for home modifications in New Zealand: the Ministry of Health (MoH), the Accident Compensation Corporation (ACC), and self-funding. Funding from MoH or ACC is dependent on various criteria pertaining to the disability, and funding may only be granted for specific modifications. For example, funding may be available for access modifications – into and within the home, and modifications to bathrooms. For MoH there are funding caps as well as income and asset testing as part of the application process. MoH does not fund modifications if: the modifications have been funded before or are short-term, meaning they will be of benefit for less than 2 years[27]. ACC does not have specific funding caps nor an income and asset testing process. ACC will provide repeat modifications if required, for example, if someone moves home. Neither ACC nor MoH will modify communal areas such as shared pedestrian access, parking, lifts or communal outdoor living spaces.

[23] Source: https://new.aucklandcouncil.govt.nz/en/plans-policies-bylaws-reports-projects/our-plans-strategies/auckland-plan/homes-places/direction-accelerate-construction-homes-meet-aucklanders-needs.html
[24] Source: https://www.stats.govt.nz/information-releases/disability-statistics-2023
[25] Source: https://www.donaldbeasley.org.nz/assets/publication-file/My-Experiences-My-Rights-A-Monitoring-Report-on-Disabled-Persons-Experience-of-Housing-in-Aotearoa-New-Zealand.pdf
[26] Source: https://www.stats.govt.nz/assets/Reports/Disability-and-housing-conditions-2013/disability-housing-conditions-2013.pdf Note: data on unmet needs was not collected in 2023.
[27] Source: https://www.govt.nz/browse/health/help-in-your-home/modifying-your-house/#846

The other option for home modifications is self-funding. Forty per cent of disabled adults in New Zealand have a paid job compared with 74 per cent of non-disabled adults[28]. According to the 2023 Census, median annual personal income[29] for disabled people in New Zealand was $24,400 compared with $45,600 for not disabled people. In Auckland, the difference in median annual income is even greater. For disabled people in Auckland, the median annual personal income was $23,800 compared with $48,900 for not disabled people. Consequently, the financial ability of disabled people to self-fund home modifications is constrained.

1.4 Relevant literature

Literature on the experience of housing for disabled people describes additional challenges faced beyond housing affordability and market availability, such as, the proximity to support services and the practicalities of making homes meet accessibility needs (e.g. home modifications, storage of mobility aids). However, there is no published literature specifically about the housing experiences of disabled Aucklanders living in MDH.

New Zealand has notable disparities between disabled and non-disabled people in terms of housing. As the previous sections have demonstrated, the lack of accessibility and disability legislation and the current housing modification funding models create barriers for disabled people to live with dignity and safety in their communities (NZDSN, 2022). As such, disabled people and their whānau continue to face barriers to securing appropriate housing (Donald Beasley Institute, 2020; NZDSN, 2022). These barriers include: limited supply, inability to negotiate modifications, and competition in the rental market, as well as homeownership (Disability Information New Zealand, n.d.; New Zealand Productivity Commission, 2024).

MDH typologies make up the largest proportion of new dwellings being consented as housing intensity increases and Auckland shifts towards a quality compact urban form. These newer housing typologies are positively influencing housing affordability[30] and have an opportunity to also increase the supply of accessible housing. However, there is limited literature on the experiences of disabled people living in MDH. There is also limited literature on the housing design for disabled people despite the demand for accessible housing (NZDSN, 2022).

The following section covers the literature in four main themes:

- Housing accessibility
- Practicalities of different housing approaches
- Housing modifications
- Addressing unmet housing needs.

[28] Source: Household Disability Survey 2023.
[29] Note: total personal income is of people aged 15 years and over.
[30] Auckland Economic Quarterly, 2024, Quarter 1. Source: https://www.aucklandcouncil.govt.nz/about-auckland-council/Documents/auckland-economic-quarterly-march-2024.pdf

A consistent thread across these areas is the call to integrate accessibility at the earliest stages of housing design and planning, rather than relying on retrofitting, which is often more costly and less effective. While MDH offers opportunities to ease broader housing pressures, its ability to meet the needs of disabled people, hinges on accessibility being embedded as a fundamental design principle, rather than an afterthought.

1.4.1 Housing accessibility

Accessibility has multiple levels. At the systemic level homes can be accessed without discrimination. At a physical level homes meet everyone's access needs and support disabled people to live fully in their communities. At a community level, disabled people can access supports and services within their geographic area. At a financial level disabled people can afford a home (Human Rights Commission, 2023). For disabled people, the ability to live in housing that is accessible and suited to their needs can provide a solid foundation for their economic security, health, wellbeing and independence (Plouin et al., 2021).

In this study, accessibility will focus on the physical design of housing: when homes are accessible and adaptable for disabled people (World Health Organisation, 2018). The design features that make a home accessible can vary for different people with different needs. The Human Rights Commission found that 17 per cent of people with a physical impairment have unmet housing modification needs (Human Rights Commission, 2022). Common accessible housing features include step-free pathways and entrances, wide doors and corridors, and a bathroom at ground/entrance level. In contrast, inaccessible housing features include stairways, narrow and long corridors, and narrow interior doors, especially bathroom doors (Maisel et al., 2008). It has been commonplace for home modifications to be completed to achieve housing accessibility (Wellecke et al., 2022).

Poor housing design can inhibit access to, and movement within, the home for disabled people, making homes inaccessible. Housing inaccessibility can significantly limit the functional abilities of many disabled people (Imrie, 2005). Housing inaccessibility is not only a physical barrier but can also lead to emotional and psychological impacts, such as frustration, dependency, and a reduced sense of autonomy, all of which negatively affect mental wellbeing and overall quality of life (Valderrama-Ulloa et al., 2024; Stewart, 2021). Disabled people have had very high rates of being persistently excluded from housing that meets their needs (New Zealand Productivity Commission, 2023).

Conversely, housing accessibility ensures the day-to-day needs of disabled people and their whānau are met and supports wellbeing and a high quality of life. Home plays a critical role in enabling wellbeing through providing a safe and restorative space. For many disabled people, their homes when most accessible is the safest place that meets their needs, and as such, they spend more time at home than non-disabled people. Housing needs to be flexible to adapt to the changing needs of households who live there (Donald Beasley Institute, 2020).

Another aspect of accessibility is access to urban amenities such as supermarkets, schools, and professional services such as medical centres (Bryson & Allen, 2017). Research states that for disabled Aucklanders, the availability of specialist services can be a decisive factor in housing location choice. Many disabled Aucklanders remaining in the region due to the concentration of

specialist services (Atmore, 2015). When there is a lack of accessible amenities, disabled people will experience limitations in their ability to live independently and participate fully in their communities. This limitation is not due to their impairments, but because the environment fails to support their independence (NZDSN, 2022). Moving elsewhere could mean losing access to essential supports that are not available outside Auckland. The housing stock, in particular MDH does not always consider the limited geographical range within which disabled residents can realistically access transport, education, health, or community support (Stewart, 2021).

1.4.2 Practicalities of different housing approaches

In this report's context, MDH illustrates the practical challenges of different housing approaches, particularly in how it intersects with accessibility, design, and planning, in both the built and living environment (Allen & O'Donnell, 2020).

Key challenges driven by the MDH that impact the day-to-day needs of disabled people and their households include:

- Storage not being of primary consideration for MDH in Auckland (Ovenden & McKelvie, 2024). As a result, there is a limited storage space and options for essential disability-related equipment, including mobility aids and medical devices.
- A lack of accessible features in housing design, including inflexible layouts alongside the high cost of home modifications. This is especially challenging for disabled people in Auckland with the highest disabled population and highest cost of living in New Zealand (McKintosh & Leah, 2017; Disability Figures, 2023).
- Disabled residents, tangata whaikaha, and their whānau's voices are not fully heard or taken into account in building design, resulting in homes that do not accommodate their needs (James, Saville-Smith & Fraser, 2024).
- Potential exclusion from new developments where proactive accessibility planning is absent, further reinforcing housing inequalities (NZDSN, 2022).

1.4.3 Housing modifications

There is a growing focus in the literature on how disabled individuals and whānau adapt their homes to meet everyday needs. It has been commonplace for home modifications to be completed to achieve housing accessibility (Wellecke et al., 2022). These adaptations often reflect both practical solutions and a desire to maintain the comfort and identity of the home environment.

Examples include:

- Modifying thresholds and entrances to improve access (Wellecke et al., 2022)
- Adding grab rails, which can require reinforcing walls, such as in bathrooms (Wellecke et al., 2022)

- Creating designated rest areas for managing chronic pain or fatigue (BRANZ, 2020)
- Reconfiguring spaces for discreet or functional storage of mobility and medical equipment (Disability Connect, 2021)
- Modifications can involve making considerable compromises in other areas of the house in order to balance disability needs and the wider family needs (Donald Beasley Institute, 2020).

The above reinforces the importance of embedding accessibility considerations into design from the outset, reducing reliance on expensive after-market modifications.

1.4.4 Conclusion

The original *Life in Medium Density Housing in Tāmaki Makaurau / Auckland* study[31] investigated how well these new housing typologies are meeting the day-to-day needs of Auckland households. Given the growing disabled population, changing housing typologies, and additional complexity faced by disabled people with housing, this specialised study was undertaken to evidence the day-to-day experiences of disabled Aucklanders living in recently built MDH so that future MDH can better meet their and their households' housing needs.

The Human Rights Commission's Housing Inquiry (2023) strongly supports a shift toward embedding universal design principles into all new housing developments, ensuring that inclusive design becomes standard practice. By grounding future strategies in evidence and lived experience, there is an opportunity to ensure disabled Aucklanders are fully considered in the planning, design, and delivery of housing across the region.

1.5 Introduction to this study

The *Life in Medium Density Housing in Tāmaki Makaurau / Auckland* study (2023) aimed to explore how well recently built MDH is meeting the day-to-day needs of households. It considered what is working well and what could be improved, how people use the available space and rooms in their homes, and how they experienced aspects such as temperature, storage, and privacy. Detailed results of the original study can be found in the reports titled *Life in Medium Density Housing in Tāmaki Makaurau / Auckland*[32] and *Life in Medium Density Housing in Tāmaki Makaurau / Auckland: Making it work*[33].

This specialised report *Experience of disabled Aucklanders in Medium Density Housing* focuses on the disabled Aucklanders and their households, evidencing how well recently built MDH is meeting their day-to-day needs. This report seeks to address the following questions: 'How do disabled

[31] Available at: https://knowledgeauckland.org.nz/publications/life-in-medium-density-housing-in-tamaki-makaurau-auckland-summary/
[32] Available at: https://knowledgeauckland.org.nz/publications/life-in-medium-density-housing-in-tamaki-makaurau-auckland-summary/
[33] Available at: https://knowledgeauckland.org.nz/publications/medium-density-housing-in-tamaki-makaurau-auckland-making-it-work/

residents and their whānau experience living in their medium density homes? What are positive and negative attributes of living in this housing typology?'

The objectives of this study include:

- Exploring how well MDH design accommodates the needs of disabled Aucklanders
- Recording modifications to homes and the functionality of spaces following modification
- Recording the impacts of completed modifications on participants and their whānau
- Including participants with of a diverse range of disabilities and long-term conditions: physical (e.g. stroke, multiple sclerosis, cerebral palsy), sensory (e.g. blind/low vision, deaf/hard of hearing), intellectual/cognitive (e.g. Down syndrome), neurodiversity (e.g. autism), and mental health (e.g. depression, anxiety).

This report presents the findings of the '*Experience of Disabled Aucklanders in Medium Density Housing'* study. The structure of this report is as follows.

Section 1 provides the context by introducing the conceptualisation of disability, describing the disabled population in New Zealand, the legislative context, and relevant literature. Section 2 describes the research methodology and provides an overview of the participants.

Sections 3 to 6 comprise the study findings. Section 3 focuses on the experience of choosing a medium density house. Section 4 explores the everyday lived experiences of MDH. Section 5 describes the modifications participants made to their homes and the impact these have had on their lived experiences. Section 6 explores the future housing needs of participants and their whānau.

Finally, Section 7 provides recommendations for Auckland Council to consider.

2 Method

This research used qualitative methodology by undertaking 'in-home immersions' in 10 MDH households with a disabled person or people living in each. An 'in-home immersion' is a research method designed to deeply understand the everyday lived experiences of participants. This approach draws from techniques in ethnography, including interviewing, active participant observation, and document analysis. Researchers spent time in participants' homes talking with, listening to, and observing them. As the researchers were shown around the homes, they developed an understanding of how the participants experienced living in and using different spaces.

The following section describes how participants were recruited into the study and the methods used. This study was reviewed by the Aotearoa Research Ethics Committee (reference: 23_57).

2.1 Recruitment of participants

The survey part of the original *Life in Medium Density Housing in Tāmaki Makaurau / Auckland* study asked households about their interest in participating in future research, and whether they or someone in their household had 'a disability, long-term condition or mental health condition that impacted their ability to undertake everyday tasks'. A selection of participants who responded 'yes' to both questions were invited to participate in this study.

Participants were selected through a recruitment screener questionnaire (see Appendix 9.1) and phone calls to ensure a mix of disabilities, housing typologies, geographical areas, household composition, and ethnicities. Unlike the in-home immersions with non-disabled households, this study did not exclude participants who were renting their home, as a smaller proportion of disabled people are owner-occupiers compared with non-disabled people (see Section 1.2).

The research aimed to include at least 10 disabled Aucklanders representing a range of impairments and long-term conditions. This number was based on the statistic that around 14 per cent of Aucklanders identify as disabled[34]. The intention was not to be representative of all disabled people in Auckland, but to capture a diversity of experiences illustrating life in MDH. Once 10 participants were recruited, the group reflected a broad range of disabilities. To include participants with visual impairment, supplementary recruitment of participants outside the survey was undertaken through known contacts and disability organisations.

[34] Source: https://www.stats.govt.nz/information-releases/disability-statistics-2023/

Table 1 shows the characteristics of households that participated and their homes. Of the 10 participants, including household members (+7 family members/partners):

- Of the disabled people: 5 have mobility impairment, 2 are neurodivergent, 1 is deaf, 1 is blind and 1 has agility impairment as their primary disability;
- 7 households own their home, with or without a mortgage, 2 MDH are owned by disabled participants' family members that do not live at the home, and 1 household is renting;
- 3 live in an apartment, 6 in a terraced house and 1 in a duplex;
- 4 are couples, 3 are adults living alone, and 2 households have one or two children under the age of 18 and 1 household was 2 adults who were parent and child over the age of 18.
- Participating households lived across the Auckland region with 3 in north Auckland, 3 in west Auckland, 2 in central Auckland, and 2 in south Auckland.
- Different ethnic groups were represented including New Zealand European, Brazilian, Cook Island Māori, Pacific and Filipino.

All members of the participating household who wished to participate were able to do so. In some cases, every household member took part, while in others, a single person represented the household.

Table 1: Characteristics of properties and households of participants

Household #	Typology	Type of primary disability	Type of secondary disability	No. of bedrooms	No. of bathrooms	Carparking	Household composition	Modification (Y/N)	Tenure
P1 AP	Ground floor apartment	Deaf	Mental health	1 bedroom 1 hobby room	1 (shower and toilet)	1 allocated underground car park	1 adult	No	Owned by family
P2 TH	2-storey terraced house	Mobility impairment		2 bedrooms 1 office/hobby room	2 (shower and toilet in each)	1 Garage 1 outdoor car park	Couple and baby	Yes (safety gates x4)	Owner
P3 TH	3-storey terraced house	Neurodivergent	Mental health	2 bedrooms 1 storage room	3 (shower and toilet in each)	1 Garage	Mother and adult child	Yes (free-standing kitchen pantry)	Rental
P4 TH	2-storey terraced house	Neurodivergent	Mental health	2 bedrooms 1 office/hobby room	2 (1 shower, bath and toilet, 1 toilet only)	1 Garage	Couple and two young children	Yes (high fencing and external deck)	Owner
P5 AP	3rd floor apartment	Mobility impairment	Visual impairment	1 bedroom 1 guest bedroom	2 (shower and toilet in each)	1 allocated underground car park	Couple	Yes (adjustable louvres and additional electrical outlet)	Owner

Household #	Typology	Type of primary disability	Type of secondary disability	No. of bedrooms	No. of bathrooms	Carparking	Household composition	Modification (Y/N)	Tenure
P6 ST DU	Single storey duplex (ST DU)	Mobility impairment	Mental health	1 bedroom 1 hobby room 1 exercise room	1 (shower, bath and toilet)	1 Garage	1 adult	No	Owned by family
P7 TH	3-storey terraced house	Mobility impairment	Auditory impairment	1 bedroom 2 guest bedrooms	3 (1 shower, bath and toilet, 2 shower and toilet)	1 Double garage	Couple	Yes (stair lift, shower over bath, grabrails)	Owner
P8 AP	3rd floor apartment	Mobility impairment	Agility impairment	1 bedroom 1 guest bedroom	2 (shower and toilet in each)	1 allocated underground car park	Couple	Yes (shower grabrails, St Johns alarm system, external lock box)	Owner
P9 TH	2-storey terraced house	Agility impairment	Mental health	1 bedroom 1 office/hobby room	2 (shower and toilet in each)	1 allocated outdoor car park	Couple	Yes (floor coverings, customised storage, heat pump, light switches)	Owner
P10 TH	3-storey terraced house	Blind		1 bedroom 1 storage room/office	2 (shower and toilet in each)	No parking	1 adult	Yes (moveable ramp)	Owner

2.2 In-home immersions

In-home immersions were undertaken between April and August 2024. Prior to the immersion, architectural and landscape plans of participants' homes were analysed to understand the neighbourhood, proximity to amenities, and the accessibility of the home. This analysis informed specific questions and provided insight into how each home was intended to function. During immersions, the plans were also used for notetaking and to verify their accuracy with participants.

In-home immersions were conducted by pairs of researchers; the first three authors of this technical report. An interview guide and observation schedule (Appendix 9.2) was developed and used to structure the conversation. The schedule was a checklist of key home features, such as entrances, kitchens, bathrooms, and circulation areas, that researchers focused on during the interview. This ensured consistency in the discussions and photo documentation. Immersions took place in participants' homes for approximately 2 hours to understand the physical context of their homes. Immersions included a set of core questions and a home tour so participants could demonstrate their use of space, modifications, and other important aspects of home life.

Data were collected through voice recordings, handwritten notes, and photography. Photographs were taken with participants' explicit consent. Consent was obtained from all household members prior to data collection, using participant information sheets (Appendix 9.3) and consent or assent forms (Appendix 9.4). For the two households with children under 16, parental consent was obtained. Researchers emphasised voluntary participation and ensured household members who did not wish to participate did not need to.

Although the nature of this research was not particularly sensitive, questions around self-care or personal hygiene were handled with care to maintain participants' dignity. Photographs were only taken where permission was granted. At the end of each in-home immersion, households were offered koha in the form of a $150 Countdown voucher in appreciation of their time and contributions.

2.3 Data analysis

The recordings of the in-home immersions were transcribed verbatim, though group in-home immersion dynamics occasionally encountered challenges with overlapping dialogue. Transcriptions were completed by both the research team using the assistance of Otter.ai and an external transcriber, who signed a confidentiality agreement (refer to Appendix 9.5).

Data analysis was conducted through two group workshops. The first workshop was held following the first five in-home immersions, and the second workshop was held after the tenth in-home immersion. These workshops served as collaborative spaces for analytical synthesis, where the research team explored emerging insights and refined themes.

The first workshop included a critical thinker, someone external to the core research team with relevant specialist knowledge, who helped prompt discussion and reflection. This session resulted in two types of thematic groupings. One based on overarching topics such as priorities in MDH, connections between disability and MDH, practicalities for choosing MDH, and challenges of proximity. The other followed a chronological structure based on participants' journeys, including themes like render vs reality, choice of MDH, everyday living, and long-term benefits and challenges. The project team reviewed transcripts from the first five in-home immersions to familiarise these themes.

In the second workshop, which included two critical thinkers, themes were further refined and consolidated. The team chose to structure the analysis narratively, following the stages of participants' experiences of choosing, acquiring, and living in their dwellings. Each stage was explored in relation to the unique opportunities, constraints, and expectations of MDH for disabled people and their whānau. All themes were visually mapped using a Miro board which helped to shape the structure and content of this report.

2.4 Presentation of results

Throughout this report, and as shown in Table 1, participants are identified by a unique code (e.g. P1) and an abbreviation of their housing typology (e.g. AP for apartments, TH for terraces and DU for duplexes). Including the typology provides additional context for participants' quotes and supports interpretation of accompanying photographs. Verbatim quotes and photographs of participants' homes are used. All photographs have been reviewed by participants and edited to protect participant confidentiality (e.g. pixilating license plates, photos on walls; see consent form, Appendix 9.4). Floor plans accompany quotes and/or photographs to provide additional context (see floor plans, Appendix 9.6).

3 Choice of medium density housing

This section of the report describes the housing choices participants made. The research found three aspects to these housing choices. The first section 3.1 focuses on housing choices pertaining to characteristics of the household, including their life stage and financial situation. The next section (3.2) explores how participants developed expectations of their new life in MDH taking into consideration previous housing experiences, marketing of MDH, and how design features were perceived to meet the household's needs. Section 3.3 discusses housing choice in relation to the neighbourhood.

Across these aspects, participants who were disabled prior to choosing their new home were considering the nature of their disability and how MDH could meet their current and future needs. Some participants moved into their new home prior to becoming disabled, preventing their disability from factoring into their housing choice. Section 3.4 describes the changing nature of disability experienced by participants and the implications of this on the relationship with their home.

Eight participants were disabled before moving into their MDH, and two households became disabled after moving in – one having a disabled child and the other having received a diagnosis.

3.1 Household circumstances

This section describes how participants' life stage was often tied to their financial situation, and how these interrelated aspects impacted their housing choices. Participants appeared to fall into one of two groups – those purchasing a first home who were facing financial constraints, and those who were downsizing in later life. Four participating households were first home buyers, and 2 households had downsized from standalone dwellings to a medium density home.

First home buyers mentioned the need to buy a home within their financial means. They stated that living in MDH was their only affordable option, particularly if they wanted to live within a specific suburb or area of Auckland. For first home buyers, MDH was seen as a stepping stone in their home ownership journey.

> *"At the time we thought this is going to be our first house, so we could do [it] sooner [as an] investment and not keep waiting longer and longer and we will transition at some point." (P9 TH)*

> *"It was just actually an opportunity to be a property owner and I've been renting for so long and yeah, we thought we should grab it because it was within our reach financially." (P10 TH)*

For participants who chose to live in 2- and 3-storey terraced houses, MDH seemed to be the only option within their budget.

"So, we know that this isn't our forever home, we always said that when we bought it. Ideally, we didn't want a townhouse. But again, our budget sort of only allowed us to get that." (P2 2 storey TH)

"We better spend this [income from previous house sale] wisely because we've got to find somewhere else to live and what happened was the cost of houses was just going up and up, day by day…It's not exactly what we wanted. We would rather had a split-level house, maybe two levels, would have been fine" (P7 3 storey TH)

"We have house preferences but due to income and bank approval, [and] because I don't have work but now I'm looking for work, it's only my husband's [income] and it's hard to buy a house with [a] single earner at the house." (P4 3 storey TH)

The one participating household who was renting shared that the rental market was very competitive. Their experience demonstrates how limited rental options and personal circumstances – that is familiarity/attachment to the suburb they grew up in can lead to MDH being the only option rather than a deliberate choice.

"[The previous landlords] felt really bad that they were selling [our previous home]… because [we were] a single mom and her sick child… But it was really nice that they never ever put my rent up… But I was so stressed. Because the way we had to apply [to rent a new home], you basically had to apply and sell yourself online… it was just so hard to get a place." (P3 TH)

"I grew up I grew up on the street down the next street. And most of my life I've lived in the peninsula… I like it…" (P3 TH)

For other participants, housing choice was less driven by financial constraints and instead seen as a longer-term option for retirement or downsizing. Participants spoke of the need for downsizing the size and number of bedrooms as well as their possessions.

"I have a lot of stuff. It's a little bit of downsizing; we've still chucked out quite a bit. It holds less than the three-bedroom home we were in." (P3 TH)

"The house price rises were getting to an impossible stage and there weren't properties available, so you had to jump in quick when you got one [property] and make that extra effort, whether it be with extra money or downsizing further." (P7 TH)

"We talked about what would be okay for me, in terms of, part of my health and disability affected my work and my income capacity. So this was bought so that I had a secure home. So I would not have said, Oh, I want to live in an apartment, just that that's what turned up as appropriate at the time." (P1 AP)

Thus, MDH was seen as a suitable option offering compact dwelling space to suit smaller households' needs.

3.2 Expectations of life in a medium density home

Participants had expectations of their daily life in their new medium density home in the while making housing choices. Their expectations were formed based on their prior housing experiences. Participants who had prior experience of living in medium or high density homes expressed confidence in considering features when choosing their homes:

> *"We'd been apartment livers on several occasions in several different cities previously, so we knew all about apartment living and what to look for, having good light, sun, a warm unit, well insulated, plenty of storage space and the layout of the home with bedrooms separate from one another, well-constructed so you don't hear the neighbours and a relatively tranquil, peaceful setting, was a bonus." (P5 AP)*

Whereas participants who had previously only lived in low density homes expressed more uncertainty:

> *"I thought when we first moved in, I thought things were going to feel small, but they feel bigger than I thought they would and generally we've had enough space to do everything" (P9 TH)*

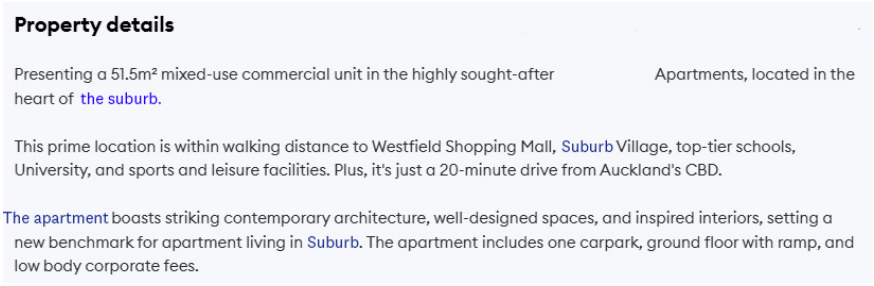
> *"I think when we were buying the house, one of the things we made sure… we looked up [the specific soundproofing requirements] to see if it seemed reasonable." (P9 TH)*

> *"So we didn't really know what we were going to get from the plans." (P8 AP)*

Marketing materials contributed to participants' expectations. These materials portrayed MDH as enabling a modern, manageable and aspirational lifestyle (for example see Figure 4). Common features included flourishing landscaping, tidy garages with small vehicles, bright open-plan layouts, and the promise of low maintenance and enhanced safety. One participant noted that their choice in MDH was influenced by how it was marketed, aligning with the advertised access to amenities and design features.

Figure 4: Billboard advertising with the first descriptor being “spacious” (P8 AP)

Figure 5: Online advertisement stating, "well-designed spaces" and "prime location" for walking to amenities (P1 AP)



Property details

Presenting a 51.5m² mixed-use commercial unit in the highly sought-after Apartments, located in the heart of the suburb.

This prime location is within walking distance to Westfield Shopping Mall, Suburb Village, top-tier schools, University, and sports and leisure facilities. Plus, it's just a 20-minute drive from Auckland's CBD.

The apartment boasts striking contemporary architecture, well-designed spaces, and inspired interiors, setting a new benchmark for apartment living in Suburb. The apartment includes one carpark, ground floor with ramp, and low body corporate fees.

“I liked the design and the courtyard... And, obviously, the location in terms of community services, and shopping and motorway, all those things they put in the real estate ads.” (P1 AP)

For many participants, the new home offered solutions to issues faced in their previous homes. Participants transitioning from unstable or poor-quality rental housing described their MDH as a step toward greater stability and improved quality of life. For example, one participant recalled their excitement about moving into a newly built home after years of difficult rental experiences. Their comments reflected a common theme: that the new MDH offers relief from longstanding housing precarity and promises a fresh start with fewer barriers.

> *“We were renting that, it was a two bedroom home. Probably more of a one and a half bedroom. And the lounge was so small that our couch blocked the front door. So we couldn't use the front door at all. So was super tiny. When we came here, it was kind of like wow.” (P2 TH)*

Participants considered how different features of their new home could accommodate the household’s disability as well as non-disability-related needs, including storage, outlook, spare bedrooms, level access, outdoor spaces, double glazing, warmth and dryness. For many, these features offered a strong possibility – particularly around the idea of minimising the everyday impacts of disability. Participants perceived the new MDH to offer several desirable features associated with

an improved quality of life and wellbeing. Section 3.2.1 considers features characteristic of new builds and section 3.2.2 describes features related to (in)accessibility.

3.2.1 New builds are warm, dry, and low maintenance

For all participants, a considerable factor in choosing their home was the fact that it was brand new[35]. For most, it was their first time experiencing living in a new home, and for some they were living in the home while other parts of the same development were under construction. There were factors centred around the environment (e.g. warm, dry, well ventilated) and security features that participants saw as being desirable and associated with new housing.

Many participants mentioned that brand new homes were not perceived to have issues with mould. This is important for the disability community due to the health effects associated with mould compounding their disability, with potential difficulty in maintaining a mould-free environment. Many participants who had been renters reported that mould was a very significant and ongoing issue within their rental accommodation, a situation they were very keen to avoid.

> *"It's hard to find rentals and then cleaning and I'm so happy because it's new, so I will never expect mould." (P4 TH))*

Another participant described the impacts of moving into the home while being unwell, but acknowledged the benefits of the new home being mould free.

> *"Actually, I was really ill when I moved here. So quite ill when I when I had to move, but we just thought [it] was all the stress. But it was actually, that's when I got my diagnosis. And actually being here was actually better than if I hadn't been here. Because it's a better house and a better home. And in that way is you know, not like not mouldy." (P3 TH)*

In the context of lack of mould, the new MDH was seen as warm and dry. The belief that homes would be warm was based on several factors including that the MDH provided heat pumps, double glazing, and were anticipated to be built to higher weathertightness standards than older dwellings.

> *"The housing, it's brand new, so it's warm, which is great." (P9 TH)*

> *"I think we're so excited because it's new. When we were renting it was hard for us to get new houses and we're excited because it's not cold, it would become warmer. And as we, my husband checked, it's double glazed already… So, we're comfortable, it's warm…my kids kept [getting] sick when it's winter." (P4 TH)*

> *"These are double glazed…that stops condensation. I mean our house in [previous suburb] was very bad in winter and I notice that we don't have condensation here." (P7 TH)*

Also in relation to warmth and dryness, the perception of many participants was that the large number of windows (as compared to older homes) within MDH would enable good light and airflow to assist with ventilation. Natural ventilation was therefore reported as preference by several

[35] Note: this study included only MDH constructed post-2016.

participants, with a decreased reliance on heat pumps (due to both cost and personal choice) as well as being seen as a healthy way to maintain good air quality within the home.

> *"The top floor has got a lot of sun coming in in the afternoon. Even in the morning it starts coming in. It makes it fairly warm in the summertime but still again with the cross ventilation. I don't use the heat pumps and so I keep opening the cupboards and expecting to smell mildew or mould or that sense of dampness and I'm just not, it's not there at all." (P10 TH)*

> *"It's got really good ventilation, cross ventilation. I thought that being closed in on both sides would make me feel restricted but the air flow's really, actually really good." (P10 TH)*

> *"Yes, well, being a sort of a corner as well, you've got, you know, if the wind's from one side, you've got protection from the other… it was particularly bad with our previous house, because it got pretty hot in the afternoons or evenings. So during the summer, we don't have that problem here." (P8 AP)*

> *"The doors are a ranch slider at that end, which is open, so during the summer there's a cross flow of air, again we don't need to use the heat pump during the summer…" (P5 AP)*

New MDH were also perceived to have low-maintenance requirements. This was considered important both for disabled participants and for family members as they got older.

> *"I guess when we decided to buy this place, we were looking for something that was low maintenance, like both of us [aren't] spring chickens anymore… We're just very fortunate to find this one. It was brand new. So, we wanted that sort of low-maintenance community feel." (P5 AP)*

> *"I've said it to him quite a lot, we would never have coped if we had stayed at [previous suburb]. This is so much lower maintenance." (P5 AP)*

3.2.2 (In)accessibility features

Participants who were disabled prior to moving into their MDH considered the accessibility features of homes. Apartments were generally perceived to be more accessible than townhouses as they included lifts, stair-free routes, and access to outdoors either at ground level or step-free balconies.

> *"Well, our previous house had a staircase going to the basement, garage, internal access, yeah, so that was getting a bit problematic. I've got a lot worse since, I might add. So we knew our days were numbered there, so we knew we had to move from there. But of course, what we were going to move to, was the issue. But as I said, I wanted a [high] outlook, and an outlook [from] apartments is about the only thing that can do that." (P8 AP)*

> *"(When asked about what attracted the participant to the apartment) Well, it had to have a lift." (P8 AP)*

"I do at times find the stairs challenging but... it doesn't matter that we've got stairs because we've got a lift as well." (P5 AP)

Within the apartments visited in this study there were no internal steps. Lifts were available to access different floors and were reported to be of adequate size for transporting mobility equipment such as a wheelchair.

Figure 6: Exterior and interior of life in an apartment building (P1 AP)

In contrast, all but one terraced house in this study had steps to the main entrance, and all terraced houses had a stair-only option to access upper floors.

One participant described difficulties in finding a home with a bathroom on every level:

"And [no bathroom on the ground floor] was a thing that I wanted to avoid but at the time that we were looking, it was almost impossible for like new developments. Everything is just bathrooms upstairs and I'm from [overseas] and I grew up in an apartment that had two levels and my mother would always tell me, 'never buy an apartment that doesn't have bathrooms on both levels and at least one bedroom', cause my mother broke her leg when she was pregnant and then she couldn't go up the stairs. And she was like, 'so you need to have a way to sleep in every level and use the bathroom in every level'. So I was kind of already looking for that, but it wasn't an option for this type of housing." (P9 TH)

3.3 Features of the neighbourhood

Participants also considered the location when choosing their home. Easy access to healthcare professionals, friends and family, specialist schools, as well as access to active transport, all influenced participants' choices of where to live. Access to amenities is reported to be a critical enabler to community inclusion in medium and high density housing (Reid et al., 2021).

Participants often spoke of the need and desire to be close to specialists, general practitioners, and other health and wellbeing providers including, occupational therapists and naturopathy/holistic medicine practitioners. Other health and wellbeing services that participants sought to be close to included fitness and yoga studios as well as therapy pools. Overall, the participants placed emphasis on the importance of being well and being near professions and services that promoted wellness.

> *"We do appreciate living in Auckland and having access to [name of specialist], four or five specialists, having them available." (P5 AP)*
>
> *"I need to be where I know I can get to the doctors." (P5 AP)*
>
> *"There's a lot of really good wellness people up here and they call it the wellness hub. So there's a whole lot of practitioners that meet up together…I started off with my counsellor…she's also into intuitive work and spiritual healing, which works so good for me. She has helped me; I'm a different person now to what I was a couple of months ago." (P6 ST DU)*
>
> *"I'm getting used to living here. The worst part [of living in my previous home] was, you know, I had to drive down because I have arthritis, I had to go for regular checkups. I have to go for blood tests every three months. And I had to make my rheumatologist on a regular basis. And I kept having to drive down there all the time…the hospital…at Northshore I mean that's a long way." (P6 ST DU)*

Some participants reported the need to be in the Auckland region to be close to friends or family members who may provide physical, social and emotional support.

> *"It's a community…That's the first choice we have, oh we are [of the same ethnic community], it's a good neighbourhood" (P4 TH)*

Those households with children reported choosing their suburb based on daycare and schools in the nearby vicinity. One household with a disabled child specifically mentioned the difficulty in accessing a special school and hoped that by living closer to a specialist school that this would remove barriers to educational opportunities.

> *"My kid, he's going to primary, so he [would] fit in and for [his] special needs, we wait listed, but not too long, there's a special school… we've been referred to the zoned area for special schools here". (P4 TH)*

Nearly all participants reported that being near public transport was a benefit of MDH. For most participants public transport meant being close to bus stops; and two participants specifically reported advantages of being a short distance from a train station.

> *"We like the location, we like the parks and getting to public transport." (P9 TH)*

> *"When I can, I will use the bus because I don't like being in the traffic or parking. And I find it less stressful." (P1 AP)*

> *"In terms of location, we're good in it....it's accessible for trains and bus, it's a good location, there's trains there. It's walking distance." (P4 TH)*

> *"At the time [of moving to the MDH] my wife was working at a school, and it's on a bus route." (P8 AP)*

For one participant who does not drive due to their disability, proximity to good public transport options was important.

> *"So we've got [name] Train Station, which is about six or seven minutes' walk from here into the city or into Britomart and Newmarket where I go regularly and then there's the bus that comes from, it's the Outer Link bus that comes from the city that drops off at the letterboxes out the front. That's a quick trip." (P10 TH)*

This participant also commented on being able to walk to local supermarkets from their home:

> *"The footpaths are adequate. I mean I walk down to... Countdown [that is] in one direction and Pak 'n Save in the other direction and there's one part of the footpath where the tree roots have grown up but [my guide dog] takes me around that." (P10 TH)*

3.4 Changing nature of disability in a household

Some participants anticipated how their needs will change in the future and took it into account when choosing MDH. However, for other participants the changing nature of their disability was unpredictable, so MDH presented unexpected challenges once they moved in. Such anticipated and unanticipated needs are described in the following section.

Disability is neither homogeneous nor static. Two individuals with similar diagnoses may experience significantly different challenges, functional capacities and support needs (Alexiou, 2022). A major part of the participants' and their whānau's lives was the changing nature of their disability, requiring continuous adaptations within the homes to suit their changing needs. For some households, the positive expectations of living in MDH prior to moving in largely turned into a reality.

> *"Depending on how I'm feeling, like if I've got, on a higher energy day, I'll walk down the stairs to the car, but we can use the lift if I'm not feeling good." (P5 AP)*

> *"The illness that I have got that makes me disabled, I wasn't diagnosed with that before we came here. But I guess when we decided to buy this place, we were looking for something that was low maintenance." (P5 AP)*

Some participants noted that co-occurring conditions meant that disability could not be reduced to a single diagnosis or need. In several cases, the disability was not limited to a single household member. Some households included multiple disabled members, such as a child with high physical needs and a parent with mental health challenges, or a couple where one partner was neurodivergent and the other had a chronic illness. This highlights the importance of seeing disability not only as an individual issue but as something connected with the entire whānau.

> *"I don't know how incapacitated I'm going to be. I could be fine. But not only that but, my wife, she has survived cancer during this time [that we have lived here]. Two weeks after we moved in, unfortunately, she was diagnosed with cancer." (P7 TH)*

It became evident during the course of our interviews that disability can be unpredictable, and household circumstances can change rapidly. In addition to new diagnoses or having children with disabilities, changes in circumstances can include anticipated progression of conditions, as well as unforeseen complications such as reduced energy, declining mobility, or loss of sensory functions. Participants shared how disability and health within their whānau had changed since they moved in and, for some, how this change impacted their expectations of a 'good life' in their new home.

> *"I could walk pretty much unaided, and I use the stick occasionally for outside bits, and any any longer, longer walks, I used the walker, and that carried on. And then, yes, then we sort of moved in here....my mobility has severely suffered, and I ended up I couldn't walk at all unaided. So I've been having to use walker ever since." (P8 AP)*

> *"We always say that he's just embraced it better than I have. Yeah. But he could relapse at any moment. And they genuinely say sort of between the age of two to five years old is where they relapse the most. Because that's where the bone or the that's where they go through the growth spurt...And now he's in the boots and bar, til at least five years old, provided no relapse." (P2 TH)*

> *"It took seven years [for a diagnosis] and you know the changing of emotion and we're just a family of four here, no other families, and back and forth I'm going to work not, when I see his improvement, yeah ... It changes, environment and another stage and then I try to oh maybe it's time and it would come time that I can work." (P4 TH)*

Becoming the primary caregiver led one participant to move in with a disabled family member who subsequently moved into a care facility. The disabled person moving into a care facility was an unexpected change, associated with significant stress on all parties, and significantly changed the participant's expectations and experience of living in MDH.

"I don't know how long I'm gonna be able to stay here... [I don't have] Power of Attorney....and so, you know, I can't sell the house... I don't know what's going to happen. I don't know what's going on...[I was] so stressed." (P6 ST DU)

A participant who was initially very happy with their new home described how the arrival of their child who was subsequently diagnosed with a disability transformed their relationship with the home:

Figure 7: Orthotic worn by a disabled child (P2 TH)

"He can't get upstairs unless we carry him. That's our issue. Probably, if I'd known I was going to have a son with a disability, I wouldn't have bought a two-storey house. We had this house before we had my son. So, it is what it is." (P2 TH)

These examples highlight how quickly a home that once seemed ideal can become a source of difficulty when accessibility needs emerge. While the house itself did not change, the household's experience of it did, shifting from a symbol of comfort to a daily logistical challenge.

Parents of disabled children spoke about how their children's needs are changing as they grow, and how this is changing the way spaces in their homes are being used. One participant with a disabled child expressed concern that their child's growing needs may impact the current arrangement of a shared bedroom between their children. Currently the elder brother acts as a support person, mentoring his disabled sibling. The spare bedroom may become the elder brother's bedroom in the future:

"For now, it's an extra room when my other kid wants to move out from his room because my other [disabled] son is too noisy sometimes, so I asked him if you could still manage your brother, yeah, and I want him to be together so that his autistic brother could have somebody to look up what to do, what to do at bedtime, so they talk too." (P4 TH)

3.5 Conclusion

Disabled people and their whānau in this study shared the aspects they considered when choosing to live in MDH. These occurred at three 'levels' – that of household circumstances, dwelling features that built participants' expectations of daily life in their new homes, and characteristics of the neighbourhood. Participants seemed to be trading-off features of their home and neighbourhood, in

consideration of, the household circumstances while choosing their homes. Some participants who were disabled prior to choosing their new home, were in a better position to consider how MDH could meet their current and future needs, based on the nature of their disability. This was however, not the case for all participants. Some participants moved into their new home prior to becoming disabled, preventing them from factoring in their disability, while making housing choices. For these participants, MDH was often unable to meet the expectations of daily life due to change in their circumstances. The next sections on everyday living (Section 4) and making modifications (Section 5) discuss to what extent were the housing choices able to meet the participants' everyday needs, and the nature of modifications undertaken to meet those needs.

4 Everyday living

This section describes participants' experiences of everyday life in their homes. Some aspects of daily life, such as accommodating caregivers, places to rest, or space to store mobility equipment, are unique to disabled people and their whānau. Other aspects of daily life are shared with non-disabled people and reflect the experiences described in the original *Life in Medium Density Housing in Tāmaki Makaurau / Auckland* report (e.g. storage of household items, laundry and carparking).

This section of the report is structured around the three occupations (self-care, productivity, and leisure) and the physical environment component of the Canadian Model of Occupational Therapy and Engagement (CMOP-E) (Townsend& Polatajko, 2007) a long-standing occupational therapy model of understanding interactions of people in their environment. Self-care is inclusive of aspects such as personal hygiene, cooking and eating, cleaning and home maintenance. Productivity describes work, including working and studying at home, as well as play for children. Leisure activities include hobbies, exercising, socialising and connecting to nature. According to CMOP-E, when these three core occupations are enabled, people's wellbeing is enhanced. In this section, environment refers to participants' experiences of both the built and social aspects of MDH, including factors such as safety, temperature, and interactions with neighbours.

4.1 Self-care

Self-care activities include taking care of oneself as well as taking care of household needs. Essential everyday needs, such as bathing and toileting, are first discussed. This is followed by a discussion of household needs such as cooking, storage, cleaning and home maintenance and supportive overnight stays. Some disabled people employ a variety of strategies and assistive equipment to be independent with self-care. Other disabled people have assistance from family members or caregivers, either paid or unpaid. The design, location and layouts of bathrooms and the home in general can either facilitate or hinder disabled people's ability to complete self-care activities.

4.1.1 Bathing

Bathing for participants took place in baths or showers, or showers over the bath, with or without assistive equipment. Participants shared how they use their bathrooms, some of which were modified to include grabrails and other assistive equipment (see Section 5.3.3 for more details).

Many of the MDH bathrooms in this study were noted to have limited circulation space[36]. Table 2 below shows a comparison of participants' bathroom areas in MDH, with the Auckland Design Manual and international guidance. Most participants' bathroom areas were smaller than international guidance. These smaller dimensions decreased disabled participants' access to and ability to manoeuvre safely within their bathroom.

Figure 8: Example of a 3m² floor area bathroom

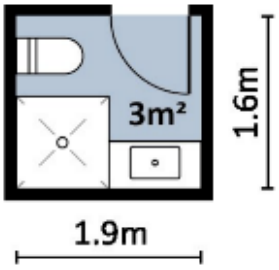


Table 2: Participant bathroom dimensions compared with recommended minimums from the Auckland Design Manual and Universal Design Guidelines for Homes in Ireland (CEUD)

	Participant's bathroom area	ADM	CEUD
P1 (1BD)	4.9m²	3m²	5.3m² (2.1m×2.5m) for showers 6.6m² (2.5m×2.65m) for baths
P2 (3BD)	4.2m², 4m²	3m² x 2	
P3 (3BD)	2.4m², 4.8m², 2.7m²	3m² x 2	
P4 (3BD)	1.8m², 6.8m²	3m² x 2	
P5 (2BD)	4.2m², 4.2m²	3m²	
P6 (3BD)	5.2m²	3m² x 2	
P7 (3BD)	3.9m², 3.8m², 6.3m²	3m² x 2	
P8 (2BD)	3.7m², 4.6m²	3m²	
P9 (2BD)	3.4m², 3.3m²	3m²	
P10 (2BD)	4.3m², 6m²	3m²	

One participant, who primarily used a 4 wheeled stroller indoors, was observed to transfer to a narrower wooden trolley in their bedroom due to limited circulation space. Access was further restricted when approaching the ensuite, as described below by the participant:

[36] A circulation space is an area within a building that are used for pedestrian travel, that is, a passage way, corridor, hallway, stairway, lobby, atrium…areas in a room that provides an exit path from another room…and other paths of travel to exits. Source: https://firewize.com.au/definition/circulation-space

Figure 9: Image illustrating participant switching from a 4 wheeled stroller to a smaller wooden trolley at position 1 and leaving the wooden trolley at position 2 to use the bathroom (P8 AP)

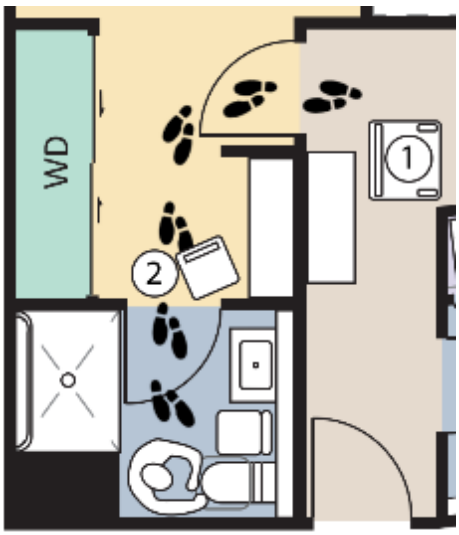
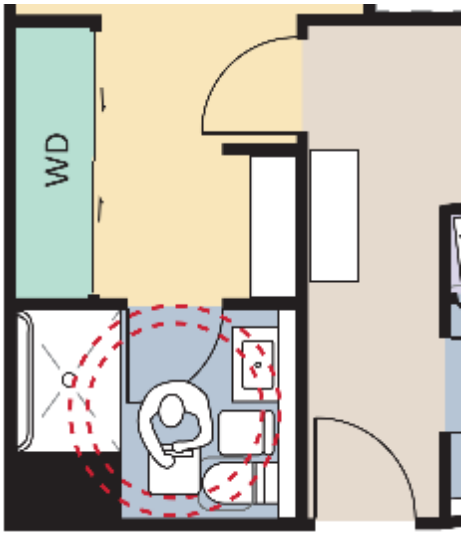


Figure 10: Turning circles of 1.5m and 1.8m diameters overlaid within the participant's bathroom, illustrating the space is too small to manoeuvre with wheeled assistive devices. The space is further restricted by the inward-opening door.



"The ensuite, yep. What I do is I park this [trolley] here [outside of the ensuite]. And then I can walk in here [into the ensuite]. Obviously, you don't want to put any weight on this [the bathroom vanity] so says the occupational therapist. Because you can't put bars there. It's not the right distance." (P8 AP)

So, if the participant were to take the trolley into the bathroom, there was insufficient space to turn it around to access the toilet or close the door behind themselves.

Another participant reported using only one bathroom within the home as the remaining felt confining:

> *"I thought I'd get claustrophobic in the small [bathrooms]. They're too small for me. So yeah, so everyone uses this one [bathroom]. We basically use this one." (P3 TH)*

"Weirdly, like I would think that ensuite would be the main bathroom for this type of house but the one over there [next to the office] that has a shower that's bigger than the one here [next to their bedroom] and we only use this one." (P9 TH)

Showers, and in particular level access ones are considered by occupational therapists to be the most accessible form of bathing for people with mobility or agility impairment long-term[37] . One participant described how they do not use the bath and rely on a shower:

"[I] don't use the bath, I can't get out." (P6 ST DU)

However, some participants expressed a desire for a bathtub due to disability-related needs. They described how having a bath can help manage pain associated with health conditions such as arthritis. They noted that their MDH lacked a bathtub, even when there were multiple bathrooms in the home.

"If I had the room, I wouldn't mind a bath. I don't use it very often, but I get a lot of pain and sometimes you just feel like if you could actually soak in some heat, that would make a big difference." (P5 AP)

Baths can be particularly important for disabled children and their caregivers. Soaking in warm water has a range of tangible benefits, such as decreasing spasticity[38] and improving joint movement (Special Needs Guide, 2017). However, in one participating household with a child experiencing mobility impairment and joint stiffness, a bath was not available. It was noted that the home had been purchased prior to the child's birth.

"We don't have a bath in this house. So, my son he showers…Yeah, we make it work." (P2 TH)

While bathing can cause sensory overwhelm for some neurodiverse children (Peske, 2024), one participating household reported that baths had a calming effect on their neurodiverse child.

"It's good for them…They really enjoy the bathtub…we're happy with the bathtub." (P4 TH)

The above underscores the idea that if multiple bathrooms are provided, giving a choice between a bath and a shower, it would meet a greater variety of needs.

4.1.2 Toileting

Some participants shared that the location of the toilet on an upper level of their terraced house was causing access challenges:

"Just the first house and the end house are the two bigger houses. So they got the toilet under the stairs…I did complain about that a lot [not having a toilet downstairs when pregnant]. And

[37] Agility is the ability to move joints. Agility impairment in adults is when individuals have difficulty with or cannot do one or more of the following: dress and undress independently, cut their own toe- or fingernails, use fingers to grasp or handle things like scissors or pliers, use arms to reach in any direction, or cut their own food. (Stats NZ, 2014)
[38] Spasticity is when muscles become tight or stiff and hard to move caused by/characteristic of certain neurological conditions.

my dad's got bad knees, he's ex-army. So he's got terrible knees and he's always moaning about having to go toilet upstairs." (P2 TH)

People need to access a toilet every 2-3 hours during the day, or more frequently for some health conditions. For one participant with mobility impairment, only having a toilet upstairs and not at ground level presented a fall risk as it required them to go up and down the stairs every 2-3 hours. The risk of falls is compounded by the design of the steep wooden stairs (see Figure 11:).

Figure 11: Steep wooden stairs (P9 TH)

A participant with a disabled child had to carry their child upstairs to toilet as they lived in a home without a toilet on the ground floor near the living area. They described how their child wears special boots that prevents them climbing stairs independently. The participant explained that, as the child is growing, it is becoming more challenging to safely carry them upstairs to a toilet. Their difficulty in carrying the child is heightened by the angled nature of the stairs (see Figure 12).

Figure 12: Angled stairs (P2 TH)

"He has to wear a special pair of boots with a bar in the middle, so he can't get upstairs unless we carry him…So we sang Twinkle Twinkle Little Star when we bring him to bed, and I'm puffing. By the time I get to the top of the stairs I'm like twinkle (puff) twinkle (puff) and you know as he's just so heavy." (P2 TH)

Falls account for 46% of injury hospitalisations in Auckland (Auckland Safety Collective, 2020) and falls on stairs are a leading cause of injury within the home of all ages, particularly for older adults. The design of internal stairs has a significant effect on safe movement within the home.

Other participants shared the benefits of having a toilet on the bottom floor. For one participant with renal failure, a toilet on the ground floor was seen as particularly important.

> *"It's helpful for him. As soon as he gets home, 'I've got to go to the toilet'. Even visitors, 'I've got to go toilet'. (P7 TH)*

Whereas for other participants having a toilet on the ground floor was seen as convenient and less disruptive to daily occupations.

> *"Yeah and when we're here like watching TV, you don't need to go [upstairs] for toilet and it's good to have toilets* downstairs*." (P4 TH)*

For some participants having a downstairs toilet is a matter of convenience, whilst for others, having a downstairs toilet is a necessity. It is vital for designers to consider provision of toilets in the downstairs or entrance level of MDH.

4.1.3 Cooking and eating

Exploring the activities of cooking and eating in MDH considered accessible storage solutions, circulation in kitchen and dining areas, and space for a dining table.

Several households had disability specific storage requirements. For example, one household had an additional refrigerator for food storage in case they were unable to grocery shop for an extended

period of time, during sickness. Due to their disability, they had an increased risk of prolonged illness or complications and therefore needed to stay at home to avoid catching widely circulating viruses such as Covid or the flu.

Figure 13: Extra refrigerator stored in second floor circulation space unplugged for emergencies (P10 TH)

"That [refrigerator] came from when I was at the other unit. I didn't want to get rid of it. Just in case... cause I was in lockdown or I needed it as an extra freezer actually." (P10 TH)

Reaching for day-to-day items is an essential task in cooking and meal preparation, few kitchen layouts provided full-height pantries. Sinks and stovetops took up most of the available bench space, leaving little room for food preparation. As a result, few pantry items could be stored at the accessible height between knee and shoulder. The knee to shoulder range is further decreased for people of shorter stature, and by disability, which may impact reach, bending and agility.

A number of participants reported that many of the kitchen cupboards were too high and thereby less usable. One participant demonstrated decreased shoulder range of motion with their right dominant arm. They could only raise their right arm to just below shoulder level due to their disability. Due to minimal shelving available between knee and shoulder height, this participant would need assistance to complete most cooking tasks.

Figure 14: Overhead shelf, 2nd from top shelf above shoulder height for the participant, researcher photographed to maintain participant confidentiality (P8 AP)

"Well, if we wanted to use anything, but my wife would need to use the step ladder. Yes, I do have a bit of an issue with getting the stuff out of the top shelf…That which is sugar when it is full it is quite heavy. Yeah, so generally, I get my wife to do it." (P8 AP)

One participant demonstrated retrieving items from overhead cupboards by climbing onto the kitchen counter (Figure 15); interviewers requested that they stop due to safety concerns, however, it appeared to be a routine manoeuvre for the participant. For another participant, it was not only the height of the shelving that was problematic, but due to the location of the shelving above the benchtop, it required additional reach over the depth of the bench and then up to the shelves to access pantry items (Figure 16).

Figure 15: Overhead cupboard above shoulder height accessed through climbing on top of kitchen bench (P10 TH)

Figure 16: In-built kitchen storage cabinet with top shelf not being able to be used as much as the others (P6 ST DU)

Several other participants discussed the height of the overhead cupboards and how this affected it's overall use.

> *"The overhead cupboards, of course, being a short person, most of the top shelf is not super safe to access... I don't really trust stepstools a lot. You know, I'm conscious that if I live on my own, and I fell off it, what the hell, so I just don't really use...I either have stuff that I don't use at all." (P1 AP)*
>
> *"[My husband] gets stuff down and sometimes I'll use the steps but he doesn't like me using the steps unless he's here.*
>
> *Participant's husband: I can reach up high and lift heavy things. That's my role. (Laughter)" (P5 AP)*

One home, however, had increased access to lower kitchen cupboards through the provision of a Lazy Susan. Another home had a pull-out pantry, which was reported to be helpful.

Figure 17: Lazy Susan (P8 AP)

A number of participants had purchased step stools to enable access to kitchen cupboards. However, for disabled people, the use of step stools can increase the risk of falls.

Figure 18: Step stool located near kitchen (P2 TH)

Figure 19: High shelving in kitchen accessed by step ladder (P2 TH)

One participant stored their step ladder in the garage due to its size and lack of suitable space to store it within the kitchen.

> *"I do use a step ladder though. I keep it in the garage…I do get the step ladder if I need I can reach those ones [shelves], but the pantry sometimes I have to [use the step ladder]." (P2 TH)*

Another participant who is blind reported, the older style stove top and controls which came with her townhouse was easier for her to manage than the newer style controls.

> *"The stove and the oven are really good. They're actually the old fashioned dials. They're not flat screen, which has been in other properties. So that works well. So it's pretty simple, I think simple and, dials are better for people who can't see the screens." (P 10 TH)*

The kitchen and dining areas of the homes were all open plan. For circulation, people with assistive mobility equipment were observed to move through these open plan spaces more easily, as they had space to turn themselves and their mobility equipment around.

Figure 20: Open plan kitchen, dining and living area. The plan allows for flexibility in furniture arrangement to provide space for circulation with mobility equipment. (P8 AP)

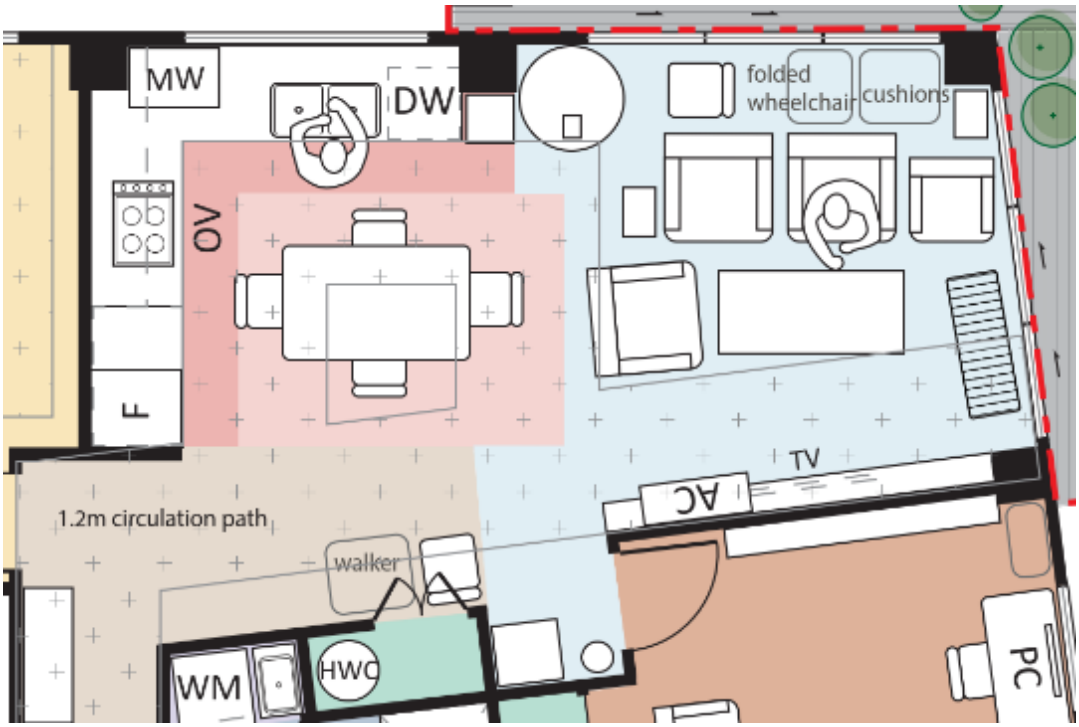
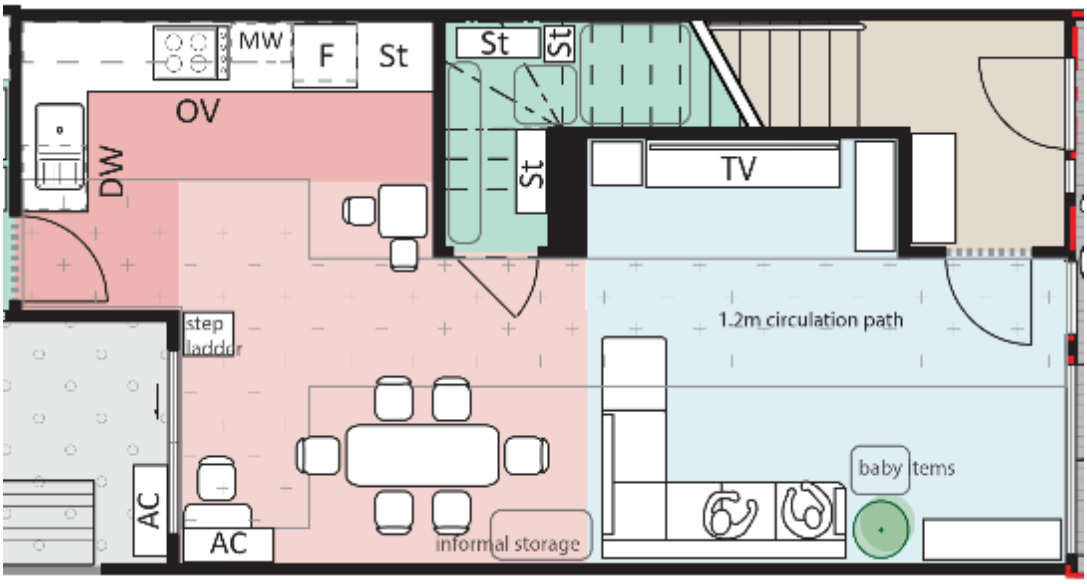


Figure 21: Open plan kitchen, dining and living area (P2 TH)

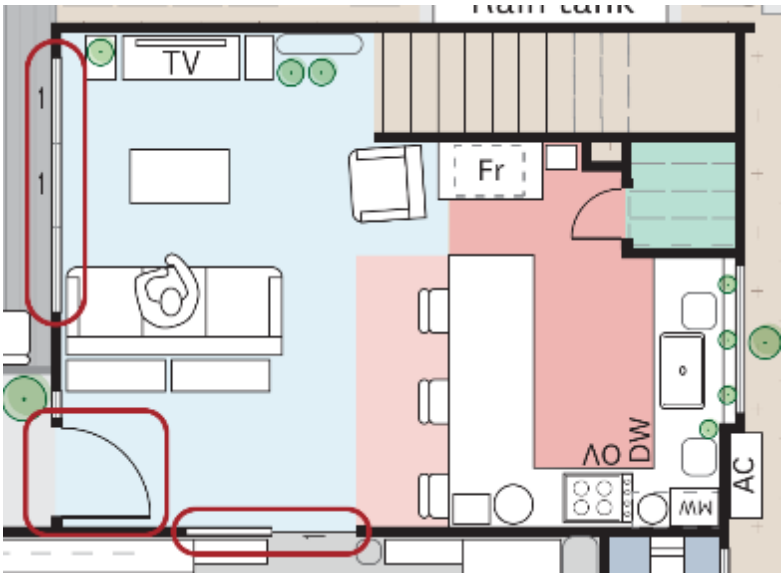


One participant who is blind, reported that open plan or sliding doors are important for safety when walking around.

> *"This door here, I also would, if I had it my way, I would probably make it into a sliding door. It's safer because doors left halfway open, they're a hazard." (P10 TH)*

Another participant noted that the layout of the kitchen and living room did not enable a dining table. This was due to three different doorways within the space. Sitting and eating together was important for this family, and due to the child's neurodivergence, distractions may need to be minimised while eating.

Figure 22: Having three openings in the living room restricted the participant from having a dining table (P4 TH)



"We have to compromise our dining. So, I tell the boys we need to eat here [points to kitchen bench] ...if they could only maximise the space like put some dining, just a dining. We're missing a dining here. I think it's a good house for us, for the family of four but we're missing some dining." (P4 TH)

4.1.4 Storage needs

Nearly all households added storage to their home. This ranged from additional shelving both store-bought and custom built, storage containers, wardrobe and cupboard shelves, to drawers and railings. The cost and need to add storage systems was a frequent area of dissatisfaction.

Several households in this study had disability specific storage requirements. For example, one household had a range of assistive equipment including essential mobility equipment, and limited space available to store it when not in use. Another participant was observed to have consumables, which are single use medical items such as masks, needles and continence supplies. Consumables can require a significant amount of storage space. Not having enough storage space meant that assistive equipment occupied circulation space within the home, which impacts on family members and visitors' ability to move about, access to cupboards or shelving, as well as decreasing the amount of space available for seating or other furniture. For example, the home pictured in Figure 23 shows a 4-wheeled stroller stored in front of a built-in cupboard, blocking access to the cupboard, and a wheelchair stored behind armchairs in the living space limiting circulation.

Figure 23: Assistive equipment inside an apartment: Perching stool, 4 wheeled stroller, folded self-propelling wheelchair (P8 AP)

This participant's mobility scooter was parked within the underground carpark of their apartment building (see Figure 26). They had to store it here due to a lack of storage space within their apartment. This results in the participant needing to negotiate a circuitous route to leave the building. The participant is required to use their 4 wheeled stroller to travel from their apartment along the corridor to the lift and down to the underground carpark. Accessing it requires using their mobility scooter through the carpark exit, as shown in figure 25. The journey continues up a steep hill to arrive at the public footpath by the front entrance to the apartment building, as evident from fig 26. The overall distance from where the mobility scooter is stored to the front of the building is approximately 150m. This distance and circuitous route is a significant inconvenience to leave the building using wheeled mobility equipment.

Figure 24: Circuitous step-free route needed to be taken by participant when using mobility asssitive devices from their unit entrance to apartment entrance (P8 AP)

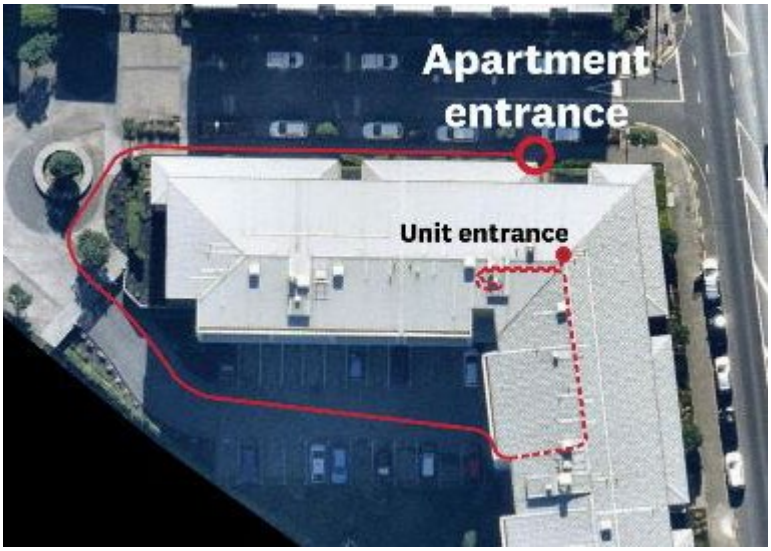


Figure 25: Steep hill participant needs to overcome to get to the public footpath (P8 AP)

Figure 26: Mobility scooters stored in underground carpark (P8 AP)

One household had an additional refrigerator for storing essential medicines. Whilst this household was able to find a location for an extra refrigerator with access to power, this was not often the case in MDH visited within this study.

Figure 27: Additional storage locker spacious enough to fit separate medical fridge (P5 AP)

"And see, I've got a fridge here. We have a freezer, some extra storage there, and that's my medication: it gets injected into my tummy, three of those a month, and this is two every week...[Name of family member] comes down and does it." (P5 AP)

One household with a guide dog, utilises a spare bathroom for storing supplies for their assistance animal. Items for the guide dog need to be stored in specific spaces and out of the way of circulation routes to minimise the risk of the blind participant from tripping and falling on these supplies.

Figure 28: The spare bathroom on the 2nd floor being used as storage space (P10 TH)

"At the moment, we're using the spare bathroom for cleaning stuff and dog stuff." (P10 TH)

Some MDH were able to accommodate the additional storage needs of participants, such as the medical storage fridge and spare bathroom for dog items. For another participant, their home was lacking storage space for their mobility assistive equipment which was impacting their ability to safely move around their home.

4.1.5 Cleaning and home maintenance

Having smaller rooms and spaces were reported by the participants to take less time and energy to clean, which is particularly important for disabled people, who may be operating on an energy budget (Stats NZ, 2023)[39].

> *"When my hip was really sore I couldn't do a lot. But now, you know everything. Everything tires you out 24/7 pain, you might know a little bit. It just absolutely wears you out. So I struggle with cleaning." (P6 ST DU)*

> *"It's new, I don't have stuff to maintain and then, and it's small…so it's fine, easy to clean." (P4 TH)*

Figure 29: Bin storage area, to minimise movement of bins for collection (P4 TH)

"We leave that space [by the front fence] just for the rubbish bin so that it easier for going out." (P4 TH)

For some participants, family members were considered key to keeping homes in a clean condition:

> *"Yeah, I avoid spills, my wife will clean it up." (P8 AP)*

> *"I do struggle with cleaning. When my daughter was here she got the carpet cleaned. So that was the beginning of March she got that cleaned and now I've got a cat that I look after…I*

[39] An energy budget (National Health Service, 2023 606f1053ec5307.76284415.pdf) is the amount of energy that a person can expend daily before needing to rest. For many disabled people, self-care activities such as washing, dressing and meal preparation require a high level of energy expenditure. So, when energy can be saved doing household cleaning or maintenance tasks, this enables disabled people to have additional energy to expend on things that they want and need to do. This is particularly relevant for conditions such as multiple sclerosis and arthritis.

struggle, I mean I can do it with one hand [vacuuming] because it just slides along. But sweeping. I have trouble sweeping the kitchen and washing the floor you know the kitchen, the bathroom. Those are the hardest things." (P6 ST DU)

For one participant, the laundry machine was less accessible due to the style and not being able to see the controls. The participant is considering strategies and modifications to make it more accessible.

"The laundry is under the kitchen bench. It's a dryer and washing machine, a combination. Which is not really accessible to me. Well, on one setting, it's one setting I can turn it on. We haven't really made it that I can reset the programme. I'm not sure how to do that. I haven't put in any particular bumps or stickers or anything like that." (P 10 TH)

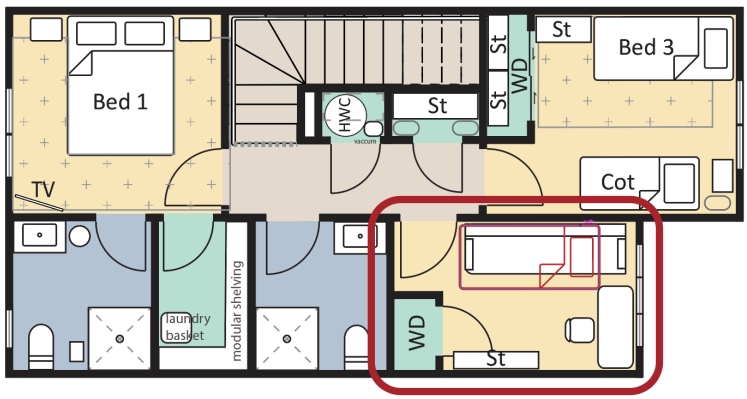
4.1.6 Overnight supportive stays

Many participants reported the benefits of having close family come to stay, whether it was for physical assistance (e.g. gardening, accessing items in storage), emotional support (e.g. during times of being unwell, accompanying to medical appointments), or social interactions (e.g. going on outings, enjoying amenities in the area).

"Our daughter mainly [comes and stays over] ... [the spare] room doubles as a study and a bedroom... if anyone comes to stay, having to share a bathroom with someone else is just [not great]... Probably the thing I don't do as much as I probably could is empty [the bottom kitchen cupboards] out and clean but my daughter does that sort of thing for me when she comes down." (P5 AP)

One participant shared the experience of their mother staying to help when their son was born and the challenge faced in accommodating her in a spare bedroom:

Figure 30: Participant's first floor bedroom of 6.6m² with width of 2.1m (P2 TH)



"I'm kind of thinking if a single bed was in here. You're either blocking the access to the door or you're blocking access to the closet. The single bed was here actually. And I remember my mom. My son was just born so my mum was staying here to help me out. And I remember she sort of squeezed between the office desk and the bed." (P2 TH)

Another participant discussed her daughter coming out to provide assistance following surgery:

> *"When I had my hip operation...my daughter, she came out my young one came out they're both doing so good you know, my young one came out the social worker one came out and so she could do stuff for me." (P6 AT DU)*

Paid overnight carers expect a dedicated guest bedroom, whereas unpaid family carers could be accommodated in a multipurpose bedroom. None of the participants currently had paid carers staying overnight, although some were anticipating this requirement in their future.

4.1.7 Self-care summary

Overall, this study finds that some aspects of MDH, such as being low maintenance and having spaces for overnight stays, are working well to enable self-care for disabled people. Other aspects, such as toilet access involving stairs, not including a bath, inaccessible built-in kitchen storage, lack of dining spaces and a lack of storage spaces for mobility assistive equipment, are not working well for participants. Participants shared how these constraints in the design of their homes make them reliant on other household members to support their access to kitchen items and food preparation. The design and layout also make it difficult for the household and visitors to move around in homes due to mobility equipment infringing on the circulation space.

4.2 Productivity

Productivity includes paid and unpaid work, studying, volunteering and play (for children). Feeling productive is associated with improved wellbeing. For disabled people, having productive occupations can enable a sense of purpose, a sense of belonging, and gain and use their skills and abilities (Moore, 2023). For many disabled people, their home environment can be adapted or modified to enable independence in productive occupations. Engaged in meaningful productive occupations from home also lessens the need for travel, which can take a significant amount of time, energy and finances.

4.2.1 Work from home

Many households used a bedroom as a work from home space for either one or two adults. Some disabled participants chose an MDH with an additional room specifically as a home office. For others, the work from home room also doubled as a bedroom or additional storage space.

> *"Yeah, it's just that when we bought this place was before we knew that we would need a full on everyday home office. So we thought we're gonna have our main bedroom, we can have a guest bedroom and maybe on the corner I can there a table and if, when, I need to work from home, I can work there. And then things changed so our second bedroom had to become a full on office. There's no space to put a bed there. So we don't have a space for guests, which is also the things we've been thinking about." (P9 TH)*

> *"The top room for my bedroom and the middle room is for my work room and office." (P10 TH)*

Figure 31: Home office – accommodating two computers and desks (P9 TH)

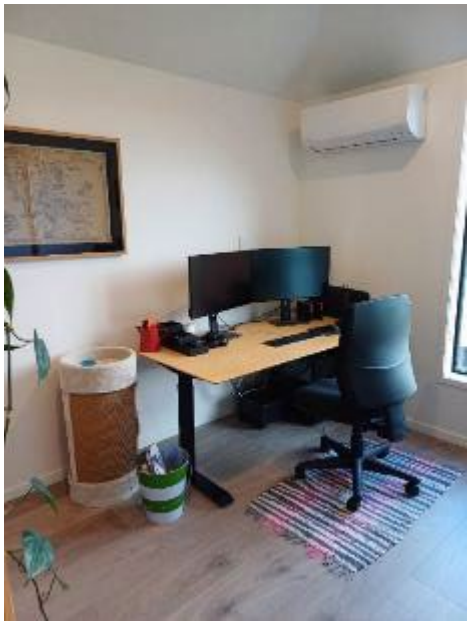


Figure 32: Home office (P10 TH)

Working from home is seen as particularly advantageous for disabled people. It as it enables disabled people to set up their home office in a way that meets their needs, enables them to take micro breaks as needed or potentially split a working day in two halves. It can also mean that they don't need to spend the time and associated energy expenditure on transportation to and from work (Multiple Sclerosis New Zealand, 2024).

A participant, who worked solely from home, had their work equipment and office set up to enable this.

> *"The middle room is for my work room and office. I'd like to use it [specific work equipment] quite a lot but I'm just trying to get some clients together." (P10 TH)*

One household spoke about home office equipment that supported disability needs.

“I already try to exercise every day but I have to work on the computer and that work I didn't have a standing desk and at home was like yep, that's exactly what I'm getting. And it changed my life.” (P9 TH)

“We've put standing desks as well, which is really nice, like in the office, he had it because the doctor makes it a thing for him…[to go] to his boss and say, ‘I must have a standing desk’.” (P9 TH)

The participant also spoke of a decreasing need to travel due to working from home. For this disabled participant, travelling by public transport could elicit pain and discomfort.

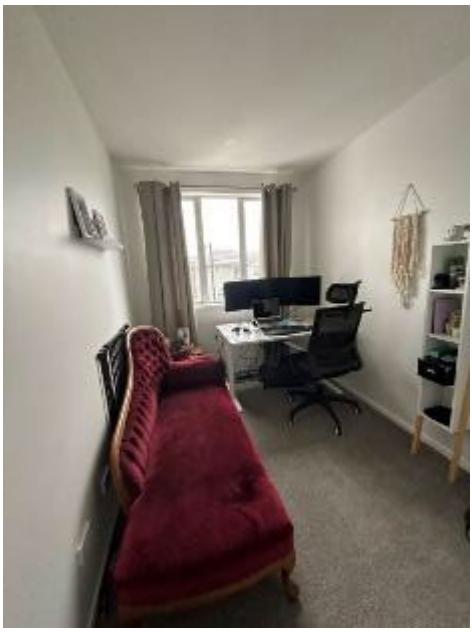
“I haven't ended up going back to the office like I thought I would. I've been working from home the entire time and that's meant that I haven't had to use public transport.” (P9 TH)

On the other hand, for one participant who lived in MDH in a semi-rural environment, reported that the lack of public transport nearby to travel to work was a significant issue.

“I get that council was sort of trying to say that homes only need one parking space, but it's very hard when we are kind of considered semi rural. So we've got no local bus stop. You know, train station is…not close by. There was a point where my husband had no vehicle for work. And he was told by his boss to take public transport. And I was like, well how? We don't have it in our area. And it would mean me waking up at four-thirty five o'clock in the morning to drop him to the train station, which wasn't doable with our son.” (P2 TH)

They balanced working from home and caring for a disabled child, utilising a spare bedroom as their home office.

Figure 33: Home office (P2 TH)

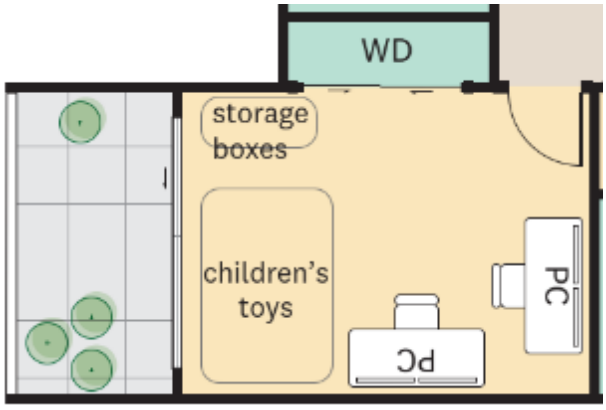


“I guess it works well, in terms of I've got that office. Yeah. Probably not a lot to this room, in all honesty. Just works as an office.” (P2 TH)

4.2.2 Study from home

One participant used a third bedroom as a room to study from home. They were studying whilst being a full-time caregiver for their disabled child. They hoped that the study would assist with returning to the workforce.

Figure 34: Study room (P4 TH)



"I'm studying online because it's been a long time since I've been at work because I don't know. My son … Back then I was in accounting department. I continue here study, it's hard for me to go back again for a long time and no experience here and different country. So I back in studying." (P4 TH)

4.2.3 Play

Play is considered a core occupation for children as play helps children to develop essential skills and improve their wellbeing (The Education Hub, 2019). Playing in a safe and supportive environment is particularly important for disabled children. Both households with disabled children in this study reported the need for places in home for their children to play.

> *"That's one of concern and then we fight for the deck because we want outdoor. I have two boys and one is autism… so he's not good closed within the house." (P4 TH)*

> *"We have swimming, the inflatable one and then just to feel for them that it's summer." (P4 TH)*

> *"We've carpeted [the garage] … so that he can come in here and play on his bike and stuff." (P2 TH)*

One participant expressed safety concerns regarding the outside fenced area, which had been intended as a play space, that her child with autism could climb the fence.

> *"First two years [in the house], my son is not so big that time, he grows big now, but he was not so big. He's a total climber. He climbs a lot. He climbs on that fence." (P4 TH)*

In both households with disabled children, they used their garages as a safe play space.

> *"My son's got the extra room to ride around on his bike and I guess working well for us too as the carpet makes a big difference having this carpeted." (P2 TH)*

“Because in winter they don't have access for outdoor. My kids play here. They have mini hoops for basketball, so they can roam around, be active, and my other autistic kid just scooter there, turn and turn and turn over here, just to make him active.” (P4 TH)

However, garages being used for play, was considered a compromise between safety and comfort. Garages are not required to meet the standards for a “habitable space” meaning that they do not have the same requirements for ventilation (G4), heating (G5), lighting (G7) and insulation (H1) that habitable spaces within a home require. The carpeting of garages, which appears to be common in terraced MDH, may give the impression that the space can be utilised as additional living space. Therefore, there appears to be a misalignment between the design intention and actual use, which raises concerns for children’s wellbeing, especially with prolonged use of the space.

4.2.4 Productivity summary

The MDH included in this study was generally found to support productivity for the adult household members. The homes had space for working from home and studying. However, play, the primary productive occupation for children, was not equally well accommodated.

4.3 Leisure

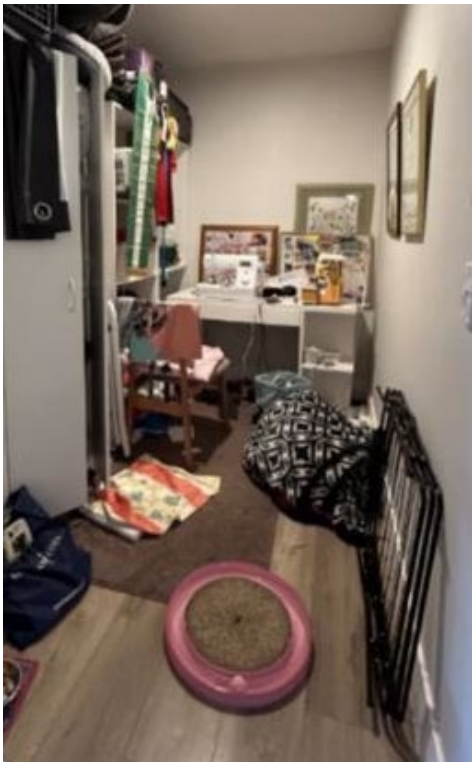
Leisure occupations are vital to health and wellbeing (Chen, 2018). In general, disabled people and their whānau spend proportionally more time at home and engage in leisure activities from home. Also, this study finds that there are additional barriers to participation for disabled people due to reasons such as, limited inclusive recreation places and challenges with transport, both to and from leisure activities.

4.3.1 Hobbies and exercise

Disabled people faced challenges accessing dedicated exercise areas, such as a gym within MDH, therefore a spare bedroom gained importance. Several of the households utilised a spare bedroom as a room for hobbies or for exercising at home, for example a sewing area and a treadmill.

“That's a study. Many of the units use it as a second bedroom. Obviously, I use it for storage and sewing. And the cats use it as like a quiet space to go to. What I like about it is that it exists and it's big enough for me to have the sewing machine and the overlocker.” (P1 AP)

Figure 35: Hobby room (P1 AP)



One household commented that whilst a gym was available within the development, it was located upstairs and that there was no lift to access it. This design and location made it difficult for older adults and people with mobility difficulties to use the gym.

> *“I mean the other thing is for a master planned community, they’ve got an upstairs gym and no lift…I mean obviously that's the developer that did that but, yeah. You would have known when they did this what type of demographic it was going to attract.” (P5 AP)*

One household used their extra room for a variety of leisure activities. It is beneficial for the son with autism to have a quiet place that is separate to engage at times in leisure activities. He was reported to have sound sensitivity.

> *“We put this as an extra room for them to draw, to play, my kids for his online activities and me and my husband play the computer, just extra room for us.” (P4 TH)*

Whilst other participants appeared to appreciate the open plan nature of their homes and being able to differentiate spaces in ways that worked for them. For one household, in the image below, the open plan area served both as a kitchen/food preparation area and was also referred to as a music space. As the participant had mobility and agility impairment, it was beneficial to engage in leisure activities on the ground floor without the need to climb the stairs.

Figure 36: Kitchen on the left, music space on the right (P9 TH)

They also used this open plan space for exercise, reporting to spend a lot of time at home. For this participant and their progressive condition, exercise was very important for maintaining joint mobility for as long as possible.

> *"I already try to exercise every day... We have a bunch of exercise stuff. We do like yoga, Pilates, yeah. We exercise at home. We pretty much live at home." (P9 TH)*

Another participant, who had a treadmill for exercise and a piano for music, remarked similarly:

> *"I guess because of my sight, I tend to have stuff at home, maybe I would anyway but I mean just for convenience." (P10 TH)*

One household discussed difficulties in attending martial arts classes away from home, due to short daylight hours in the evening. This disabled participant, whose disability meant they had additional difficulty learning new routines, reported not feeling safe walking to the classes.

> *"I don't want to walk there in the night because I don't feel safe. I just I just finally picked up on having to do the [steps] because it was like It's like a puzzle in the head of my brain doesn't like certain things like it's hard to know. Yeah, through the steps. This guy showed me in a way that I understood and I was able to do it...*
>
> *[Participants' mother]: "Normally he walks but I'll drive him because it's going to be dark...You don't walk through the alleyway at night I just get worried." (P3 TH)*

4.3.2 Overnight social stays

For one household, the ability to accommodate many family members overnight was seen as a cultural expectation. For this household, additional beds, mattresses and bedrooms were available to accommodate immediate and extended family staying overnight.

"We've got family we've got to think about and they do come and visit us here cause we do have space, we can make space to have them stay over…This is [name of suburb] motel. (Laughter)… Yes. We seem to be a halfway house for anybody who's going over to the Islands or back home here." (P7 TH)

Figure 37: Bedding and space to accommodate family overnight (P7 TH)

One family with friends located quite a distance away felt that their home didn't have sufficient space to have friends stay overnight. Maintaining social connections is very important for families with disabled children.

> *"We get here in [suburb] and closer to… my kid's sports activity, it's closer for trainings. {Suburb], good access, we have games there and tournaments. It's good. Good sports and area. We found at least we fit in, my kids fit in. So that's good." (P4 TH)*

> *"It's hard for us, our friends, going in and especially they are far, like from North Shore…adults [parents of the children's friends] are drinking, they would stay overnight, so can't accommodate all." (P4 TH)*

Research demonstrates that autistic people desire friendships and relationships much like non-autistic people, but face barriers in making and maintaining relationships due to difficulties with language and communication (Meyer, 2024). Therefore, it is important that once friendships are made, they can be maintained over time.

Most households reported that their home could not accommodate friends or distant family members as it lacked a dedicated guest bedroom or bathroom. When asked if their space works well with visitors, a participant responded:

"It is with family but when I have other friends staying over, I'm not comfortable with one bathroom or don't like the one bathroom [so close to my bedroom] … such a lovely house and only have one bathroom and makes no sense to me." (P6 ST DU)

Another household considered a wall-mounted bed as a way of adding additional use to their office room but couldn't make it work with the size of their standing desk otherwise required for disability related needs.

"We considered for a time having like you know those ones [beds] they're up on the wall and then you pull down… because of the size of my desk, it doesn't fit in any direction. So we couldn't do that." (P9 TH)

4.3.3 Social gatherings

Hosting social gatherings at home can be important for some disabled people, as the energy expenditure to socialise in the community may be too much. Others have their homes set up well for independence (such as personal hygiene) or as safety (such as high fencing), which means that there is a preference to entertain at home. One household specifically commented that neighbours were much safer to host, versus engaging in social gatherings in the public realm.

"I've had COVID twice and both times I got pneumonia, attended big gatherings but spent time in hospital. So to me, avoiding that is really a top priority. So, we don't go to any big gatherings, but we will invite our neighbours. We love our neighbours. We absolutely love our neighbours and they're all so considerate and none of them would ever do a thing that they thought would bring any danger to me. So I know that, I can't live without taking a risk, but I know that these people minimise that risk for me." (P5 AP)

Some households reported that culturally they were expected to host large family gatherings and found that the space available in MDH was not adequate for this purpose. This included a lack of a dining area and insufficient outdoor spaces. When asked about their open plan lounge, which one household referred to as their entertaining area, the participant responded:

"We can hang around the four of us but when we have guests it's really hard because when [people of our ethnicity]-celebrate there's lots of food, there are lots of people…It's hard for us to celebrate on their birthdays, they are in winter, and it's supposed to be inside. It's okay for a summer [birthday] because we can put tables and chairs [outside], we can accommodate lots of people in summer, but winter, for celebrations, our house can't accommodate too much." (P4 TH)

Another participant remarked that the area provided for the dining room did not encourage large social groups for meals.

Figure 38: Dining table positioned in a tight corner due to limited space (P9 TH)

"I think if we entertained people more, it would be nice to have a little bit more room around the dining table instead of having it shoved away in the corner." (P9 TH)

One household that had an end unit in a terraced house development used additional space outside for car parking.

Figure 39: Additional guest parking space outside garage (P7 TH)

"Well this is why we bought at the end of the [development]. Yeah, if we have a guest and they can [park on the empty space]." (P7 TH)

Another participant, who didn't have a garage, reported there was limited parking available for guests.

> *"There's no parking onsite, that's a real leveller as well. If you don't have a garage, which I don't have a garage, then, or even if you do have a garage, your guests are asked to park on the road." (P10 TH)*

4.3.4 Outdoor spaces

Participants spoke about their desire to connect with nature, both visually and physically. Connecting with nature is recognised as an important amenity for people and is known to have benefits for health and wellbeing (Auckland Council, 2025b; Auckland Council, n.d.a.; Mental Health Foundation of New Zealand, 2025). Some participants were able to achieve this at ground level, having a vegetable or planted garden, while for other participants this was via a balcony. Three participants talked about how community gardens could benefit residents and create social opportunities.

"We have a community garden out the back there... they started growing vegetables and herbs and things too, so for the residents' benefit... the wife collects some of the vegetables and herbs now and again when they're in season...in the summer, we have had a neighbour's day [in the garden]." (P8 AP)

Figure 40: Vegetables grown on community garden near basement carpark entrance (P8 AP)

"There are vegetable boxes as part of the complex as well. Some new ones have just gone in...now we're getting our new little plot [vegetable box]. It's a small one and I'm doing, I'm going to do herbs and lettuce... I think it would be good for me to walk down there every day and look at it." (P5 AP)

Figure 41: Vegetable boxes near apartment (P5 AP)

"I would have liked a community garden space, because I know that some of my neighbours like to grow their Chinese vegetables and will also be a way of people to come together". (P1 AP)

Some participants described the importance of having a dedicated space to rest, recharge, and find relief from symptoms. In practical terms, this often meant access to a quiet, sunlit area within or near to the home, such as a balcony or courtyard.

> *"For enjoyment of the outdoors, having this [balcony] space means that we can feel as if we're experiencing the outdoors without having to leave home... We call it another room... It is our main living space...It's really important to us. The ranch slider opens right up. It opens right up so it's almost like you're out there when it's summer." (P5 AP)*

> *"I can have lots of pots. And you know, I can try growing my own food...And, you know, it's just a nice space to either use actively or just passively." (P1 AP)*

Figure 42: Courtyard of apartment complex (P1 AP)

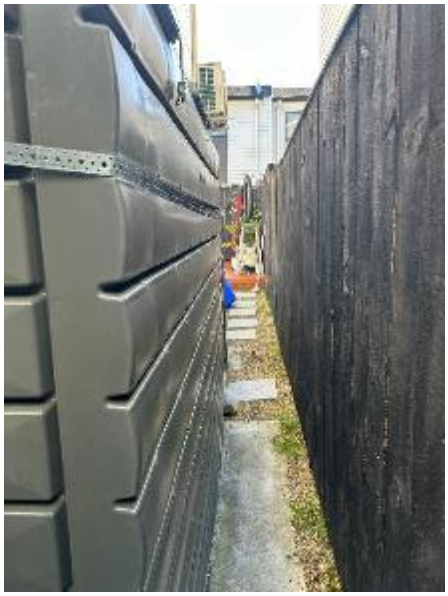
"I liked the design and the courtyard... Personally, I feel that if you have a facility like this, which has clearly been designed by an architect that's thinking about how people live together and how they use space, like having that courtyard really, and having these planter boxes, they've really thought about it." (P1 AP)

Figure 43: View from corner apartment balcony (P8 AP)

"I wanted an outlook. An outlook in apartments [were] the only thing that can do that...Being a sort of a corner as well, you've got, you know, if the winds from one side, you've got protection from the other. And I guess your north facing was quite good." (P8 AP)

However, some participants reported that their homes had very small outdoors areas. One participant described fighting for a smaller dimensioned rain tank just to be able to access their backyard. The smaller rain tank enabled the participant to squeeze through a 468mm gap to maintain the area at the back, for example, pick up toys or rubbish that have ended up in the yard either from the disabled son's window, or from the neighbour's balcony.

Figure 44: Narrow path (468mm) to access back yard (P4 TH)



"It's a big adjustment for us with smaller outdoor... if you notice the other houses has a big tank...I request to make it slimmer because I think we have a different design of all the houses. I don't have an exit door in my garage, I don't have exit door on the sides and like other houses when they see oh they have exit there, this is their garage, they have exit door... How can I go at the back if you block this [access to the back yard]. So I fight for that, that's why we have a smaller [rain tank]." (P4 TH)

Figure 45: Participant's ground floor plan indicating side and rear yards (P4 TH)

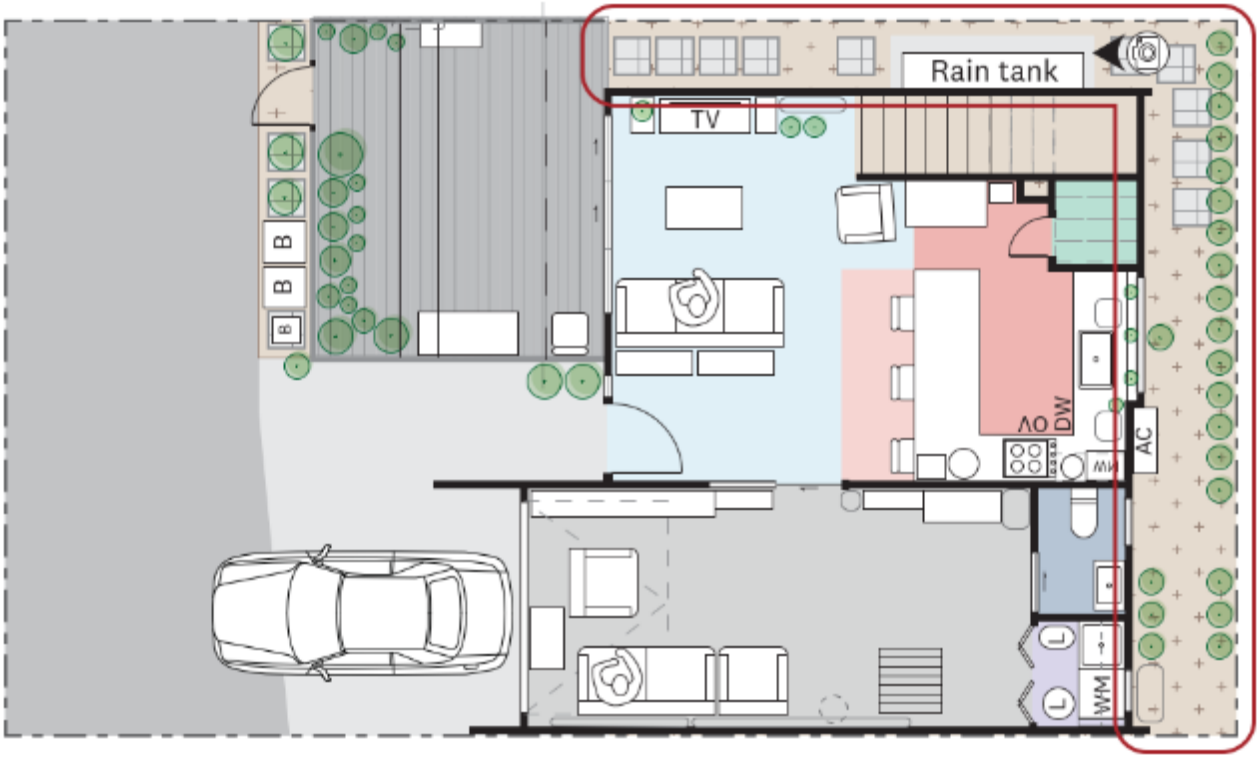


Figure 46: Back outdoor living space (P9 TH)

"We don't really use the back [outdoor living space]...It's quite small and there's like the air conditioning outside units, which is not... great. It's just quite small and contained... I think it's more for the cat than for us because she likes going there." (P9 TH)

Figure 47: Participant's ground floor plan with outdoor spaces at both front and back (P9 TH)

For two participants with disabled children, having an accessible nearby park was important. Having smaller yards/outdoor spaces within their MDH meant that having green accessible spaces nearby gained importance.

> *"Just putting a nice new park up the road which is pretty cool. So we go there quite often." (P2 TH)*

> *"And then there's a park here... we probably go to the park and going for walks... we like to go for a walk we meet people we used to know." (P3 TH)*

Outdoor spaces need to be well designed and adequately maintained over time. In one household, participants had heard of neighbours being seriously injured from falls in communal areas.

> *"The footpaths... are actually quite dangerous and our neighbour just down the hall here has fallen over on the footpath recently because it's done in those tile things and they get uneven... I don't walk anywhere without just looking at the ground now because of that, and she fell over and broke her wrist and her arm... she's over 80. And another resident who doesn't live here*

now... has gone into care because he broke his femur. Never came right... They're not the only ones." (P5 AP)

Figure 48: Lifted footpath pavers causing trips and falls (P5 AP)

4.3.5 Leisure summary

Participants' homes were able to accommodate a range of leisure activities. Spare bedrooms and open plan living spaces provided room for hobbies and exercise. Some participants found their homes lacking space to comfortably accommodate overnight visitors and host social gatherings. Participants in apartments with balconies and communal outdoor living spaces, such as vegetable gardens and courtyards, reported that these spaces worked well for them. Those living in terraced houses with private ground level outdoor living spaces were dissatisfied with the size and access of these spaces. The importance of design and maintenance of outdoors spaces was emphasised.

4.4 Environmental aspects of everyday living

Participants shared several environmental issues related to their homes, including noise disturbances, thermal discomfort, privacy and safety concerns. While these issues may not be major in isolation, participants described their cumulative effect on their wellbeing. Sensory and emotional impact, such as fatigue from noise or anxiety around safety were mentioned. These environmental aspects affected participants' ability to stay well, demonstrating that housing design extends beyond physical accessibility – it must also support emotional and sensory wellbeing.

4.4.1 Safety and privacy

Across the in-home immersions, the concept of safety and the ability to be in a secure, supportive home environment was raised repeatedly. Safety and privacy are particularly important for disabled

people, who may feel more vulnerable in their home environment. Some disabled people do not want to advertise their disability to the wider community. For example, a ramp at the front of the house signifies to the public that the house belongs to a disabled person, which makes them feel vulnerable to theft or abuse. Disabled participants in this study saw their safety as being partly dependent on their homes providing sufficient privacy so that they, or identifiers of their disability (e.g. ramps), were not visible from public spaces.

Figure 49: Pedestrian entranceway (P10 TH)

"I just feel so much happier and more sort of safe and dignified really to not have an entrance way where everybody's like watching you from the street, coming in or who's coming in." (P10 TH)

Regarding MDH design, several households reported greater sense of safety with the living areas and bedrooms being located upstairs.

> *"I like, out of these sort of places. I like the kitchen and living in the middle [storey] because it feels safer."* (*P3 TH)*

However, they wondered how they and their disabled adult child would escape from the third story bedrooms storey of their terraced house in the event of a fire.

One household reported having a St John medical alert alarm. The purpose of these alarms is to ring for assistance in the event of a medical event or fall (Hato Hone St John, 2025).

> *"You may have noticed that there is actually a lockbox attached to the railing out there. well, there's two. One of them, I think, is the real estate agents using it for one of the apartments that's for sale, and the other lock box is for me... I think that it's solely for St John's." (P8 AP)*

However, in order to gain access to the apartment building, the participant needed to arrange for a secured key stored outside of the building's entrance.

Figure 50: Secured key stored on handrail for St John's to access the apartment (P8 AP)

Another participant with hearing impairment stated that they now have difficulty using the buzzer system that was installed after they had moved in. They reported concern about emergency services gaining access.

> *"Now they [visitors] have to work out the buzzer, was like a four digit code, which isn't the same as the apartment number or they have to get buzzed in. So if you're having an emergency, you might not be in a position to [let someone in], especially if I was on my own. So hate those gates." (P1 AP)*

Several participants also discussed the amount of glazing. Whilst this was seen as an attractive feature by many participants prior to moving in, with letting in of natural light into the MDH, it was subsequently identified as a privacy issue, once they moved in.

> *"I don't know if I'd like to be looking into everybody's [homes], when you see them sometimes, oh they can see in...I don't know why they filled them with like all glass. No thank you very much." (P3 TH)*

> *"At first we got intimidated because there's no privacy, even though I get higher fence. They have windows there [points next door]. And we didn't feel, at first we didn't feel a homey style because the buildings [windows], so that's why we put some greenery just to feel the vibes." (P4 TH)*

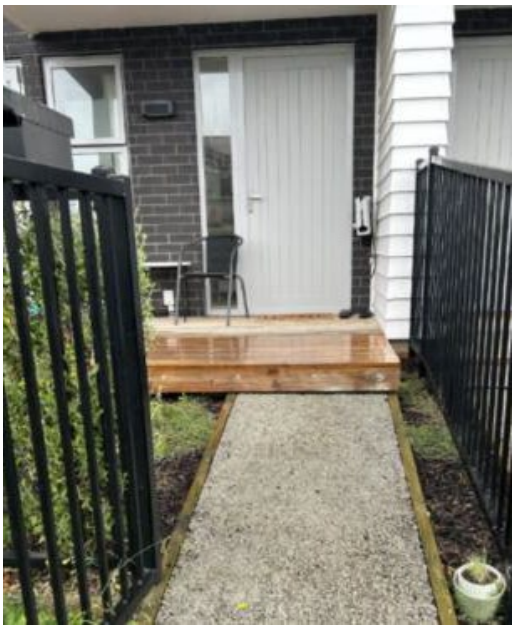
> *"[There is] no privacy when we open our [window]... it's too big. The whole window is the whole wall. All the houses here, one wall, the glass, so it's so hard." (P4 TH)*

Some participants reported privacy concerns about the clear glass panel being located directly beside the main entry door. Whilst this glazing was provided for households for added safety, the participants reported that the people outside could see in, thereby reducing their privacy.

Figure 51: Glass panel to the right of the front door (P3 TH)

"I don't very much like this (glass panel next to front door). People could just smash that and come in … it does bring in light. I guess it is necessary to see people." (P3 TH)

Figure 52: Front door (P2 TH)



"We have thought about blocking that window [by the front door] by tinting it…The only good thing I do like about it is that you can see people when they come to the front door. Yeah, we've tried to, we couldn't find a blind. That small. So tinting yeah…We tinted that ourselves just to give us that privacy." (P2 TH)

Several participants remarked that they preferred the peephole on the door to see who was at the door before opening it.

> *"I wonder why they've gone away with the little peephole. It just seemed like such an old school thing that worked. (Laughter)" (P7 TH)*

One participant, who was having increasing difficulty using stairs, reported that the intercom system had not been well designed. They could see and speak to someone at the front door, but did not have the ability to let them in.

> *"It's the bell. Just the bell. You can't open the door from up here. Isn't it stupid?...So we have to walk downstairs to open the door." (P7 TH)*

Also, for another participant with hearing impairment, the fact that the hedges around their deck had grown quite tall, it impeded her ability to easily interact with her neighbours. She reported that the body corporate mandated the new height of hedges. People with significant hearing impairment are reliant on visual cues to enable interaction.

> *"I used to see people walking past (before the hedge grew taller) and if I wanted to say hello, I'd give a wave, so I really liked that... So I don't know how high they're meant to grow...Because when you go out there you can see, maybe like, a super tall person. You can't see who it is anymore." (P1 TH)*

4.4.2 Noise from neighbours and the neighbourhood

Participants reported issues with sound from their neighbours and the neighbourhood (e.g. traffic and construction) entering their homes. For some participants, this was a small inconvenience, while for others it was an issue that exacerbated their disability. Several MDH features contributed to sound entering homes, including the proximity of neighbouring homes, double glazed windows, and soundproofing in intertenancy walls. The issue of noise from neighbours was more common amongst participants living in terraced houses.

A participant in a terraced house shared how they can hear their neighbours snoring, closing wardrobes and other sounds through the intertenancy wall[40]. They shared concerns about their disabled son's ability to sleep through the night due to the noise.

> *"I've told [the developers] that we can hear snoring. And he essentially told me it's in my head... I mean, we were told it was a fire rated wall... But I'm just not sure it's a fire rated wall, that you could still hear snoring through it. You can also hear...when they flip the charger [on the wall]." (P2 TH)*

> *"One thing I don't like, is the wardrobe slams. So I can hear next door's wardrobe slam. I can hear it from my office. So that was a big concern for us because the house next door was an Airbnb until about a couple of weeks ago, the owners moved back in. So we would constantly, we actually put off moving him [my son] into this room because of the noise from the Airbnb. And then we were like, you know, we're just gonna have to do it and just hope that he sleeps through the noises." (P2 TH)*

[40] The ITW between one unit and another is a legal boundary. An **intertenancy wall** is a legal boundary wall that provides vertical separation between separate units in multi-residential buildings, such as apartments and townhouses. Source: https://www.buildmagazine.org.nz/assets/PDF/Build-192-40-Design-Right-Inter-tenancy-Walls-In-MDH.pdf

Another participant talked about hearing their neighbours at night and how it impacted their disabled son's sleep, who has associated sound sensitivity due to autism. The neighbouring balcony overlooked the windows of their son's bedroom.

"We get the neighbour here…because it's too close, you can hear them. Their balcony is in our, and their window. So when they're talking till midnight…my son said, 'oh Ma, it's getting harder to sleep'. They don't sleep…because it's too close. We didn't notice that structure of the house. It's the neighbourhood. We didn't expect that. It's facing on us…It's three storeys so it really blocks our house. We never expect that…it's too close." (P4 TH)

Figure 53: Proximity of neighbour's balcony to children's bedroom (P4 TH)

This household was unable to use either of the other two bedrooms for the children due to the presence of balconies posing risk of the child with autism climbing the balcony on the second floor.

> *"I can't put them here because it's a big sliding [door] and there's a balcony and I'm so scared with the balcony, that's why I put some plants there because he climbs. He might, I don't know what he's thinking about there." (P4 TH)*

Another participant shared how the sound of neighbouring children playing with balls was negatively impacting their mental health.

> *"I actually didn't want to live in a development that had areas, an area for kids to play in front of my house. I have a lot of anxiety, I have a lot of panic attacks… And kids is a thing that I struggle with. I struggle with the noise, I really struggle with balls flying around. So once they started that, I started having panic attacks and I started to hate summer because summer's when they go out the most and summer comes and I get really anxious and yeah, it's like it really deteriorated my mental health since we moved here I think." (P9 TH)*

Construction and traffic noise was also reported. One participant discussed the noise and disruption to their children's bedroom due to construction at the back of their home. One son has noise sensitivity associated with neurodivergence.

> *"I think they were just removing the house there and then lots of constructions over there. It's a mess out the back because of construction, lots of sand bits. It takes a year and a half I think they built that. Yeah, it's hard because that's their room". (P4 TH)*

4.4.3 Temperature and ventilation

Nearly all households reported that their disability and health were impacted by being too warm or too cold. Upstairs bedrooms in particular were reported to be too hot in summer. Several participants reported that large amounts of glazing contributed to higher and lower temperatures within their homes. Being able to open windows and ranch sliders was seen as a good way to increase ventilation; however, there were barriers such as high window latches and noise from neighbours, which meant that this was not always feasible.

Disabled participants reported that when their home was either too hot or too cold, their disability related symptoms increased.

> *"Particularly the heat actually does affect me." (P8 AP)*

Another participant reported her arthritis pain increased when it was raining or cold. She stated that whilst she had a heat pump, it was too expensive to use, so she employed alternatives to stay warm in winter.

> *"It's so expensive. I mean that the winter payments have come in now but the power companies... put the [price of] power up every April and it's just not fair. I mean it's so expensive now... I've got my rug and sit here with a hottie. I'm actually going to buy an electric blanket this year...before when my hip was really sore I couldn't do a lot." (P6 ST DU)*

Other participants echoed the cost implications of using heat pumps. One reported using the fan setting rather than the air conditioning setting on the heat pump. Another stated that rising electricity prices and fixed incomes were significant barriers to regular use of the heat pump.

> *"We haven't [used the heat pump] we just use the fan heaps more." (P3 TH)*

> *"Well the cost of electricity now is a burden for people on pensions and we're on a pension." (P7 TH)*

All participants living in terraced houses reported that upstairs rooms, including bedrooms, were subject to overheating in the summer months, which mirrors findings from the earlier MDH study (Ovenden & McKelvie, 2024). The Ministry for Social Development recommends between 18 and 21 degrees as an optimum indoor temperature for people with illnesses or older adults (MSD, n.d.) "High indoor temperatures can cause heat-related illnesses and increase cardiovascular mortality" (WHO, 2018, p. xv)

Figure 54: Sun coming through the north facing third floor bathroom window (P3 TH)

"You'll notice this upstairs and my bathroom. The way that the glass is, is it amplifies the sun. So you come in here and it's just like cooks you." (P3 TH)

> *"Summer is more of a challenge, especially the bedroom. We weren't able to get AC installed in the bedroom. So, in summer it's just hot, hot at night. Yeah, in the bedroom, cause our main bedroom's up here so it's north facing, so it gets really warm during the day and in the evening it doesn't cool enough... So, during summer, we sleep with all the curtains open and I'm like, I don't care if people are watching me, I don't care. So that we can open the window all the way and let the air through. Because yeah, we tried to put the air conditioner but that didn't work." (P9 TH)*

Another participant expressed concerns that the south facing side of their home was too cold, where her disabled child slept, fearing it could have an impact on the child's sleep quality and overall health.

> *"What I notice with this house, the whole other side [south facing]. It's colder. It's colder sometimes because it's glass. Even though it's double glazed but the thing that the whole wall of this side of the room is glass, so it's cold." (P4 TH)*

Several participants discussed strategies of maintaining a good indoor temperature and ventilation, and barriers to achieving this. One participant reported that whilst they had a large sliding door to the 2nd storey deck, which could have been used to increase ventilation, they weren't able to keep it open due to smoke from a neighbour's home. This was reported to negatively impact their asthma.

> *"If someone's smoking on their decks, we have to close [the ranch slider]. We did that because of the neighbour that when they had the elderly people come over here to smoke a lot so we just have to close [it]. I have asthma so it's no good." (P3 TH)*

Windows, one way of increasing ventilation and moderating temperature, were often observed to be in high and inaccessible locations in a number of MDH. This particularly affects people with agility impairments who have additional restrictions with respect to reach.

Figure 55: High latch to open window in a bedroom (P8 AP)

Figure 56: High latch, above the kitchen bench, to open the window (P7 TH)

One participant, who is blind, reported using a chair to be able to open a window. This poses additional risk for falls.

> *There's a little chair near the landing - that's what I use to climb up and open that window up there." (P10 TH)*

4.5 Conclusion

These findings highlight the importance of considering the whole whānau, not just the disabled individual, in housing design and layout. Achieving the occupations of self-care, productivity and leisure in a manner that promotes wellbeing requires homes to support disabled people to be independent as well as accommodate appropriate levels of family support and/or caregiving. Well-designed homes facilitate this balance by including the space to accommodate people (e.g. overnight support) and necessary objects (e.g. mobility equipment, medical fridges), as well as being designed in ways that enable independence (e.g. free of steps, accessible kitchen cupboards). Housing supports physical, emotional, mental, and social wellbeing, and therefore needs to accommodate the dynamic nature of disability and its impact across the household.

Participants' day-to-day living experiences suggest that housing design should account for:

- Enabling independence to complete self-care, productivity and leisure occupations in and around the home

- The evolving nature of disability over time and the need for accessible layouts that can adapt to new or changing conditions
- The presence of multiple impairments or household members with differing needs
- The cumulative impact of sensory and environmental factors on wellbeing
- The need for restorative and quiet spaces
- The need to feel safe and secure within the home
- The ability to modulate internal temperature in a cost-effective way

These considerations are especially relevant for MDH, where the balance between space, proximity, and adaptability is particularly delicate. Creating supportive, inclusive homes requires not only physical access but attention to how disability changes over time – and how homes must remain supportive across those changes.

5 Making modifications

Many participants chose to make modifications to suit their disability related needs. Some participants attempted to make, or made, changes to their home prior to moving in through negotiation with developers and real estate agents. Others undertook modifications after living in their home for a while. For some, this meant that the modifications were occurring whilst they were living in the home, presenting its own challenges. Many participants demonstrated creativity in making MDH spaces work well for them and their whānau.

This section describes participants' experiences of making home modifications. The first part of this section explores the concept of agency and how participants experienced agency, or lack thereof, when making modifications. The second part is focused on participants' experiences of negotiating with developers and real estate agents to make modifications prior to moving in. The final part of this section illustrates the modifications and 'workarounds' participants made to their homes, including storage solutions, installation of stair lifts and grab rails, and changes to improve temperature and privacy.

5.1 Agency to make change

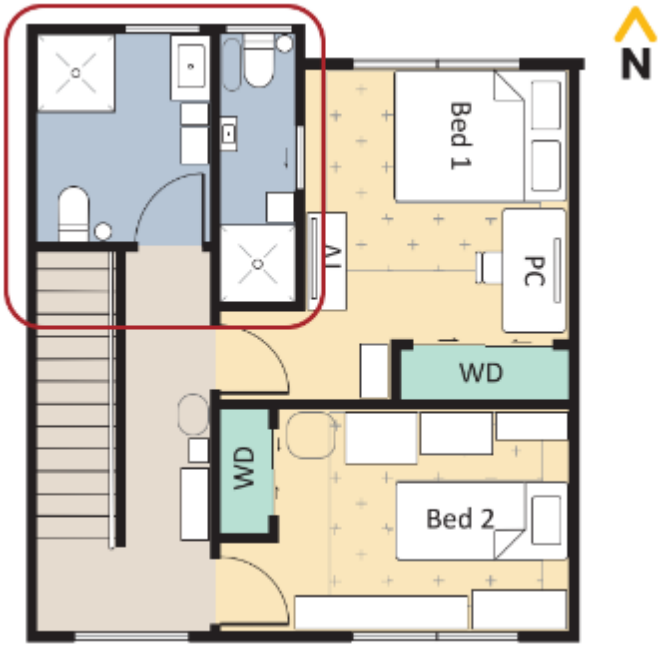
Agency refers to a person's sense of control in life – the capacity to influence one's own thoughts and actions, to shape decisions, and to trust in one's ability to manage a wide range of situations. In the context of MDHs, participants reflected on how their agency was enabled or constrained by both external systems and internal capabilities.

Across the study, participants described barriers that limited their ability to make changes to their homes. These included tenancy restrictions that required landlord permission, and body corporate or residents' association bylaws that prohibited everyday practices such as drying laundry in front of windows, storing potting mix or rubbish on balconies, or keeping pets on shared lawns. These rules, although seemingly minor, often carried significant consequences for disabled people who needed to adapt their space for comfort, safety, or accessibility.

Other research has identified renters' limited agency as a barrier to housing modifications for disabled people (NZDSN, 2022). Tenants must have a rental agreement of more than 2 years to be eligible for MoH funding and landlords may decline property modifications for a range of reasons, which they do not have to disclose to the tenant. One participant reported that landlord permission was a limiting factor to making alterations to their home.

Figure 57: North-facing windows of participant's second floor bathrooms (P3 TH)

"The main part bathroom, it gets so hot. It's so hot in there. But we don't own the place. So, we can't, you know, put anything up." (P3 TH)



Government funding mechanisms also played a major role in shaping participants' agency. For example, Ministry of Health housing modification funding required that any approved change meet a person's disability-related needs for at least two to three years, as assessed by a health professional (MoH, 2014). This policy meant some participants were denied support despite clear and immediate needs. One participant reported being denied funding for a stairlift after moving into their new three-storey terraced house. Despite being mobile with a walking stick at the time of the request, they reported that their funding application was declined. The participant ultimately self-funded the installation of a stairlift for thousands of dollars[41].

> *"We were knocked back by the occupational therapist that came to see us from, was it Auckland Health Board? We wanted to see if we could get assistance [funding], well we had to pay for this [stairlift] ourselves, they wouldn't give any assistance for that, and we thought well maybe a second one they might chip in but no... They said you shouldn't have bought a house with stairs." (P7 TH)*

Governance structures were another system that affected agency. Body corporate and residents' association rules shaped participants' sense of control. Several reported encountering strict or inflexible policies that limited home adaptation or their use of space. In some developments, signs displaying rules were prominently displayed which some participants saw as creating a sense of restriction as in some cases they could not easily comply with the rules exactly as they as written, for example, needing more time or a different place. (Figure 58 to Figure 60).

[41] Stairlifts in Auckland are reported to cost from $8500 for a straight stairlift up to $24,500 for a curved stairlift to go up one storey of a house (Stannah, personal communication 230725).

Figure 58 Photo of signage (P1 AP)

Figure 59 Signage next to exit gate (P1 AP)

Figure 60 Photo of signage next to one of the apartment's entrances (P1 AP)

Participants expressed frustration as they shared some of their experiences complying with body corporate rules. One participant who had difficulty lifting heavy items shared that they were 'told off' for not complying with rules for storing gardening rubbish and potting mix:

> *"If I left rubbish from my gardening I would get told [off]... Oh my god, it's so exhausting just talking about it. We got told there was a specific sized fr*** outdoor box that you can get... If I got my potting mix, and it's delivered because it's too heavy. And if I had it on the deck here,*

where [the body corporate Chair] could see it, [the Chair] would say that I had to move it in…The stress of that was incredible. Like I really wanted to move but you know, I couldn't." (P1 AP)

Another participant described rules about drying laundry in front of windows:

"You're not supposed to put them [laundry] in front of windows according to the rules but no one can see in there anyway. And you're not allowed to have them on the deck but if I wanted to, I can just close those shutters and who the hell is going to see it." (P5 AP)

Despite these barriers, participants found ways to exercise agency. Some took on leadership roles within governance structures to advocate for accessibility and maintenance needs. Three of the ten households included someone in a leadership role within their local residents' association or body corporate. For some, this was empowering and improved responsiveness to access needs. For others, it introduced new stress, requiring ongoing advocacy and responsibility for ensuring equitable participation.

One participant whose spouse became chair of the body corporate discussed the challenges of the role, including the need to maintain a functioning lift – an essential feature of accessibility.

"So, [my spouse] bears the brunt of it. He looks after this building… the Body Corporate wasn't really functioning at all when we came here and some of the things that happen are just unbelievable, like the lift people were sending us bills but not actually coming out to do the checks they're supposed to, that sort of thing." (P5 AP)

"…there are more building remediation issues that the developer still needs to address, and [my spouse who's chair] has to be on their backs [regarding] some building remediation issues that the developer still having to do and [my spouse] has to be on their back the whole time." (P5 AP)

Another participant, who became Chair of their body corporate, enacted a rule with the intent of improving the outdoor communal area. However, the rule could have an unintended consequence of prohibiting assistance animals from entering the space. This demonstrates that even those who live with disability are not always cognisant of others' specific challenges.

"Before I came to become the chair… we have a community garden out the back there. It's just a lawn and a couple of shrubs and things… this is a pet friendly environment. However… the lawn… didn't look the best, you know, weeds and things… the gardener suggested, well, when you've got dogs that are here constantly peeing on the lawn, it's not going to help much. So, we decided to actually ban pets or dogs from being on the lawn.[42]" (P8 AP)

Lastly, one participant reflected on different experiences with Body Corporates and residents' associations in making changes and responding to maintenance issues.

[42] There is no legal requirement to provide toileting facilities for assistance or support animals in private residential communal spaces (Guide Dogs New Zealand, personal communication 230725).

> *"I wasn't [the chair] for the last two years and then I was getting really annoyed with things not happening because [the] Residents Association [isn't] that onto doing things like a Body Corporate is. And I do miss a Body Corporate in that regard." (P9 TH)*

Participants demonstrated their abilities to advocate for their needs through participation in governance structures and used those roles to find resolutions to issues in their homes.

Other participants developed creative workarounds to adapt their homes. Examples included installing stairlifts and grab rails, using shutters to dry laundry discreetly, or making changes to improve temperature control and privacy. In several cases, modifications were only possible because participants or their families self-funded the work, drawing on internal resources where external systems fell short.

Taken together, these experiences illustrate the complex interplay of structural constraints and individual strategies. While agency was often constrained by funding rules, tenancy laws, and governance structures, participants continued to advocate for themselves and to employ practical mechanisms to shape their living environments.

5.2 Negotiating modifications with developers and real estate agents prior to moving in

Prior to moving into their home, some participants negotiated with developers and real estate agents to make changes to their home. Some participants phrased this experience as a 'fight', illustrating the degree of self-advocacy required to modify houses to meet their household's needs.

One participant with an autistic son described 'fighting' for a deck and fence to help meet their son's needs. Children with autism are at higher risk of wandering from their home and have decreased safety awareness, for example from vehicular traffic (Acraman, 2020).

Figure 61: Fencing added at front of property (P4 TH)

"We fight for the deck because we want outdoor [space]. I have two boys and one has autism…so he's not good enclosed within house…So it's a big adjustment for us with a smaller outdoor [area]. Because it's here [out front of the house], it's not part of the plan the deck, it's just an open [area] and it's hard for me to have autistic kid with open [area], no gates. So we fight for the fence and the gate…We move in, it's like a month after they finished." (P4 TH)

Figure 62: Aerial image of participant's house within the development (P4 TH)

If other households in the development also fenced their outdoor living space, then this could cause access issues for the development as a whole. Continuous row of fenced areas along a narrow lot would obscure sightline for both vehicles and pedestrians, increasing the risk of conflicts. Moreover, fencing would visually and physically constrict the space of the driveway.

The same participant also described fighting for additional storage for their kitchen.

Figure 63: Space next to refrigerator modified for storage (P4 TH)

"We fight for that, pantry…We fight for that. The builder, they just closed that [space next to the refrigerator] and we said the space inside is so vacant, so why we'll use it. So that's why we fight for it [the pantry]." (P4 TH)

Not all participants reported fighting with their developer as achieving the outcome they wanted. One participant described how details in the plans for their home were not delivered and how they continue to argue with the developer over the installation of a gate and the provision of two car parks.

Figure 64: Rear outdoor living space being fenced off by participant for safety (P2 TH)

"My other issue with the developer at the minute is the plans also have a gate [behind the laundry area before the parking bay] that we were never given … he's told us, we're more than welcome to install ourselves. But I told him that this is a safety thing for our son, because this is a thoroughfare for two houses. My husband [has] had to go outside before and tell someone to slow down. So that's a big concern for us, I guess. But we were actually given a gate from a friend. So we're going to put that in ourselves because developers not coming to the party." (P2 TH)

Figure 65: White box indicating the location of the non-functional second car park. (P2 TH)

"We were sold this place on two parking spaces and we never got it. I'm actually having a bit of an email argument with the developer at the minute, because it's on the plan and he's denying it."

"... We used to park our car in [the garage], it was a nightmare. I've hit the wall...We also can't open our car doors with a kid." (P2 TH)

Because the child in this household has a physical mobility impairment, it is important that car doors can open fully to safely transfer them in and out of the vehicle. When car doors cannot be fully opened, caregivers may have to twist while lifting the child, which increases the risk of injury (Turanga, 2024).

Another participant reported that their real estate agent informed them that they were unable to change anything when purchasing their home off the plans:

> *"We bought it off [the plans and the] real estate agent said, 'you can't change anything, absolutely not'. And there was only [one] thing that we managed to ask them, which was to install a conduit to our carpark because we wanted to eventually have an electric car. The real estate agent said that we couldn't change anything." (P9 TH)*

The sense of frustration and upset was exacerbated when seeing other new owners in the development successfully negotiating modifications.

> *"After we moved in, what got me really [upset] is that I found out that a bunch of the people who actually had bought from the developer, changed everything, because the developer was super flexible, and let them change everything, even gave them a list of things of like you can tick what you want and it's going to increase on the price but you can add to your house. So that got me really [upset]." (P9 TH)*

Not being able to make changes prior to moving in also meant discomfort for the couple; they had to live in the home as modifications were undertaken, as discussed in Section 5.3.

One household however, reported having a license to occupy, which meant that they were able to complete many home modifications prior to moving in.

"Everything else we had done before we moved in. Yeah. Well one of the good things you can do about here, is you can get this, if it's a new place, from the developer, you can get what they call a license to occupy. It doesn't mean you can move in and live here but for a few weeks before you settle, you can actually pick up the keys each morning and drop them back at night." (P5 AP)

5.3 Modifications and its impact

Households made a range of housing modifications so that their homes better suited their needs. Eight out of ten households made disability related modifications to their homes. For the two households that did not make modifications, neither owned the property they were living in; one participant was renting, whilst the other was living in a property owned by their relative[43]. While some participants anticipated making modifications soon after moving into their homes, for others this was unplanned due to changes in their existing condition, new diagnoses or having children with disabilities. The following section describes the modifications undertaken by the participants and its subsequent impacts on their daily lives.

5.3.1 Fixture and furnishings

One participant who reported being unsuccessful in negotiating modifications to their new home prior to moving in, spoke about their experience in changing the floor coverings to better cater to their asthma. They described living on the bottom level of their home for three months while the upstairs flooring was changed. The bottom level of their home does not have a bedroom or bathroom which meant they had to go upstairs to use the bathroom while the flooring was being changed.

"The bottom floor came with this flooring and the upstairs would be... carpet. I have asthma, I have a cat that has bronchitis, cleaning cat hair out of [carpet] is a nightmare ... So, after we moved in, we had the floor replaced, but it was very difficult. Like we had to live here, in the bottom level, while they were replacing the top level, because it took three months for the floor to arrive in New Zealand... I think because we were living here, and it was such a stressful situation... It was like a nightmare situation." (P9 TH)

Another participant installed two power outlets within a built-in living room storage closet. The outlets were positioned at approximately chest height and were being used regularly as a household charging station, with cords neatly concealed behind sliding doors. This location aligns with several accessibility and universal design guidelines recommending outlets between 600-1000 mm above floor level to improve usability for people with limited mobility (Refer to Section 8.8).

[43] See Table 1 in Section 2.1 for details on which participating households made modifications.

Figure 66: Power outlets added into the apartment (P5 AP)

"We set up some charging stations there... We had them put those plugs in... slide the doors so it's out of sight." (P5 AP)

One household reported replacing all light fixtures within their home with ones that were easier and less painful to turn on and off.

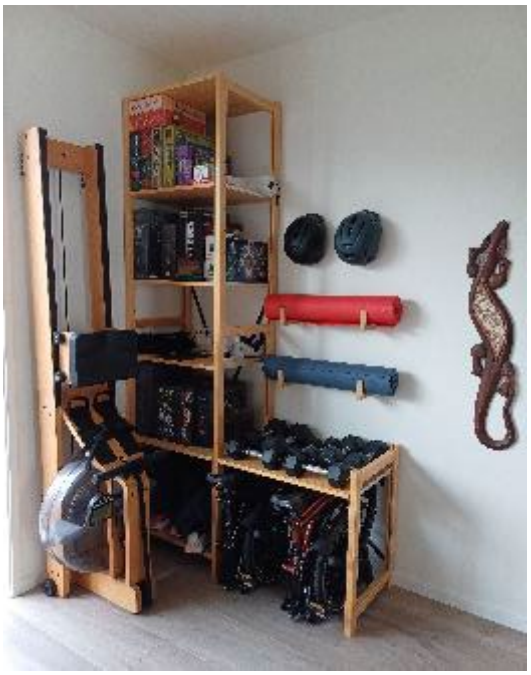
> *"Like we even replaced all of the light switches in the house. And that was like a thousand dollars... So I paid to replace with nice ones. They were really hard and sometimes I have pain on my wrist... Like for me to turn it on, I would get a sharp pain on my wrist." (P9 TH)*

5.3.2 Fitting a smaller space

Many participants purchased furniture to work specifically for smaller spaces. Some participants reported needing to buy smaller couches and dining tables, and selling their previously owned furniture as it did not fit within the available space.

A participant with a progressive mobility and agility impairment found an innovative solution to store their exercise equipment, such as yoga mats, weights and a rowing machine, essential for him to maintain strength and flexibility (see Figure 66). They also deliberately purchased folding bicycles to securely store within their home, as no garage or storage unit was available with the terraced house.

Figure 67: Foldable exercise equipment to occupy less storage space (P9 TH)



“For shelving we have probably exercise equipment, it took us a long time to find shelves that would fit this place and we ended up going with something modular so we could measure it to fit the space exactly.” (P9 TH)

“I think we have adapted a lot. For instance, we bought bikes that fold down so that we could keep them in the house because we don't have any external storage space.” (P9 TH)

As discussed in Section 4.1.3, a number of households encountered barriers to performing kitchen tasks and employed various strategies, such as step stools to access pantry items. In one household, the person who was neurodivergent needed to see all their pantry items at once, otherwise, they were unlikely to eat the items before the expiry date. As this kitchen did not have any cupboards with glazing to see items, nor were permanent modifications allowed due to being a rental home, the family purchased additional open shelving to accommodate this disability related need.

Figure 68: One of the open pantries near to the kitchen, open shelving chosen on purpose to suit disability related needs (P3 TH)

"[He] needs to see what he has. Otherwise, he doesn't see it. So if he doesn't see it, he doesn't use it. And then it goes out of date." (P3 TH)

For another participant with agility impairment, they added additional storage to have shelving available at an accessible height. This required removal of a dishwasher, necessitating a trade-off.

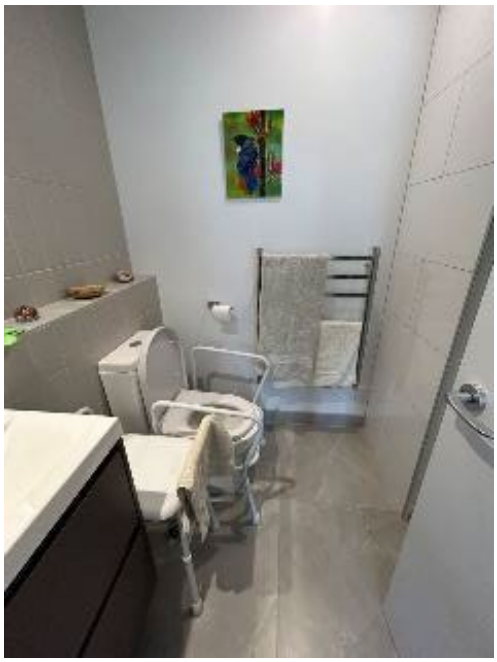
Figure 69: Overhead cupboards requiring a stepstool for access (P9 TH)

"I think they were just like when you make the shelves all the way to the ceiling it makes the impression of the room seem taller, like interior design wise, and they were like just put a shelf and people can use it for things you don't use very often. But since it's not a very big kitchen, it turns out that we actually have to use them a lot. We even removed the dishwasher that was there to make extra room for shelving." (P9 TH)

5.3.3 Bathrooms

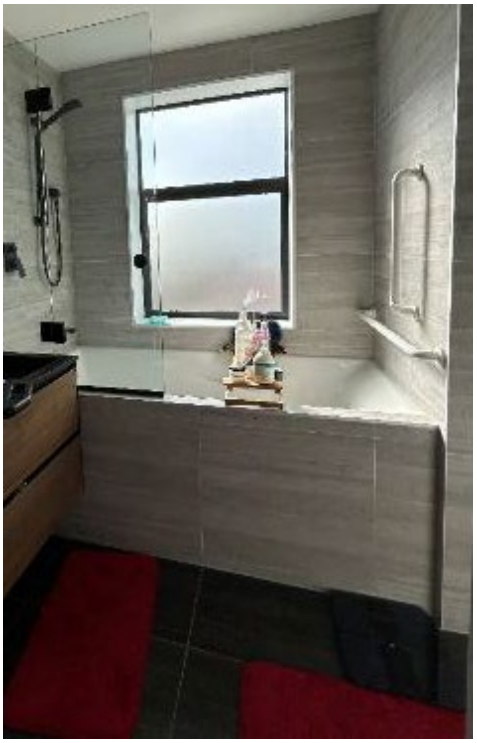
Participants shared modifications they made to their bathrooms, such as the installation of grabrails and addition of assistive equipment such as shower stools and toilet frames.

Figure 70: Over toilet frame (left) and grab rail in shower (right) (P8 AP)



However, as previously described in Section 4.1.1 and pictured above, due to insufficient space in this bathroom mobility equipment could not be brought into the bathroom and grab rails could not be added to assist with balance and transfers to get to the toilet.

Figure 71: Grab rails added by shower over the bath (P7 TH)



Another participant mentioned very high side to their bath, pictured above (approximately 750mm). The participant reported being tall they were able to get into the shower over the bath with the support of the grab rails, however, getting in and out of the deep bath was problematic.

> *"Maybe with my knees and my hips and what not, it's very hard to get up, out of it... I have a shower here cause the bathroom's, the bath's too high." (P7 TH)*

These examples demonstrate that modifications such as grab rails and assistive equipment were helpful, but due to the bathrooms' design and layout, participants' access and safety needs could not be fully resolved.

5.3.4 Negotiating stairs

One household (discussed in Section 5.1) self-funded a stairlift between ground and the middle levels of a 3-storey terraced house.

Figure 72: Ground, first and second floor of P7's terraced house.

In this home, the living room, dining room and kitchen were located on the middle level. The participant also reported that they spent most of their day in the middle level.

When asked how things had changed for them since purchasing the house, the participant responded:

> *"Well, kidney failure, tiredness is the worst. Your body works hard to keep doing what it's doing...plus I've got hips are gone and my left knee's arthritic...but they won't operate [on] me while I've got kidney [failure], because they say it's too dangerous...I'm at Stage 5, which means I'm about to go on dialysis and what I've done is put that chair [stairlift] in and use that room downstairs, initially for me to be able to have home dialysis. So that room down there is a utility room. It normally doesn't have a bed in it but it's gonna have a bed in it plus me." (P7 TH)*

Figure 73: Stairlift (P7 TH)

Another participant constructed a movable ramp at their front entrance to negotiate a significant threshold, despite not currently requiring it themselves as a blind person. It suggests a deliberate effort to accommodate visitors with mobility impairments. Such modifications highlight how accessibility considerations often extend beyond the immediate needs of the household and may also point to the participant's social networks, including others with disabilities. This finding aligns with similar research indicating that disabled people often build their community with others who share similar experiences or overlapping access needs (Silverman et al., 2017).

Figure 74: Participant's entrance modified with a ramp to accommodate visitors using mobility assistive devices (P10 TH)

5.3.5 Thermal comfort

Several households added heat pumps for both heating and cooling., as well as thermal curtains to assist with temperature management. As discussed previously, some disabled people and older adults are not able to adequately maintain their body temperature (thermoregulation.) Therefore, the design of MDH to manage extreme temperatures, is paramount.

A participant with arthritis reported adding a heat pump to their office as their symptoms exacerbated in cold temperatures.

> *"None of the upstairs has decent ventilation. We had a heat pump, additional heat pump installed in the office so that we could use it as an AC during summer." (P9 TH)*

Whilst heat pumps were provided in living areas, in many MDH homes, no heat pumps had been provided in bedrooms. Bedrooms were often located upstairs in terraced houses and reported to fluctuate greatly in temperature. One household was told that they could not retrofit air conditioning into the master bedroom due to a lack of space in the ceiling cavity.

> *"Our main bedroom's up here so it's north facing, so it gets really warm during the day and in the evening it doesn't cool enough. We tried to get AC installed, cause there's like a manhole in the hallway upstairs and once the guy came to install it, he opened the manhole and no one can get up there. You can't get under the roof. There's so much wood that no one can get through. So he couldn't install the air conditioning in the bedroom." (P9 TH)*

Another household modified the existing balcony louvres to make the fins adjustable (refer to Figure 76), allowing greater control over sunlight, ventilation, and rain. To be able to treat the balcony as an extension of the living area for comfort and usability, the household needed greater control over environmental exposure.

Figure 75: Participant's balcony (P5 AP)

Figure 76: Louvre fins being adjustable (P5 AP)

5.4 Conclusions

Participants in this study completed a wide range of modifications to their homes. Modifications completed prior to moving in were preferred, as compared to completing the modifications while living in the home.

Modifications included grab rails and a stairlift for safer movement and transfers. Participants added a range of storage solutions to enable meaningful occupations in their home, and to make smaller spaces work better for them. Participants with children added fencing and decking to provide safe play spaces and additional space to socialise with friends and family members. Participants also made changes to the environment, including flooring and thermal comfort, thus enabling them to manage their health conditions better.

Modifications were either funded by the Ministry of Health or self-funded. Whilst one participant received Accident Compensation Corporation caregiving assistance, ACC was not reported to fund any modifications to their MDH.

While home modifications created a sense of control and safety, it also underscored a broader challenge: most MDH is not designed with long-term accessibility in mind. As a result, households are often required to retrofit or adapt spaces over time, navigating a disconnect between the original vision of the home and its evolving function in daily life.

6 Looking to the future

All participants in this study were anticipating and actively planning, or beginning to plan, for future changes. This included changes in personal life, such as changes in their health and disability needs, as well as changes in the requirements and responsibilities as a caregiver.

The presence of a caregiver within the home, be it a spouse or parent, played a significant role in how participants perceived the suitability of MDH. For these participants, caregiving and support from their whānau were central to achieving a sense of safety and stability – whether that meant assistance with day-to-day routines and activities or enabling greater independence. Caregiving, both by those who live with someone with a disability or those who live apart and support someone with a disability, is a multifaceted role that involves planning, physical effort, and emotional labour to support another's wellbeing (NZ Seniors, 2023). Recent research in New Zealand also found that 54 per cent of carers surveyed had a disability or chronic condition themselves (Carers, 2020). The demands on caregivers and whānau can be magnified in MDH, where space can constrain their ability to provide support.

Participants' perceptions of whether their current MDH was a long-term home or a temporary solution varied, due to both disability-related and non-disability-related reasons. As Chapter 3 explained, for some participants, MDH was their first home, a step on the property ladder, while for others, it was downsizing from a larger standalone home. Some participants knew about their disability prior to moving into their home, while others received a diagnosis after moving in. These factors influenced whether participants saw their MDH as a long-term or temporary home.

The first section considers how participants were preparing for changing needs. The following two parts of this chapter summarise the design features of MDH that either contributed to it being experienced as a temporary home (by creating barriers to living well) or as a long-term residence (by supporting wellbeing and daily life).

6.1 Preparing for change

All households described plans around future disability and caregiving needs. For some, this planning was detailed and included contingencies for declining health or loss of independence. For others, the plans were more informal, focused on likely support arrangements or practical adjustments to living spaces.

In households where the disabled person had a known progressive condition, there was often greater clarity around future needs. It allowed such households to make early housing decisions that balanced independence with anticipated supports. Others worked to preserve current levels of function for as long as possible, using design features-such as single-level layouts to delay or reduce

reliance on caregivers. Participants described adapting their expectations rearranging rooms, choosing specific furniture, or drawing on past experiences such as apartment living.

Paid carers believed to require a dedicated guest bedroom, whereas unpaid family carers could be accommodated in a multipurpose bedroom. None of the participants currently had paid carers staying overnight, although some were anticipating this requirement in their future.

> *"We'd like to think that if we do need some care as we age, we'll be able to hire people to come in here … Rather than go to a retirement village…We really want to avoid that scenario if we can" (P5 AP)*

Regardless of approach, participants actively considered how their needs and the needs of their whānau might change over time. A participant with a mobility impairment spoke about the uncertainty of their future abilities and the needs of their wife who was diagnosed with cancer:

> *"I don't know how incapacitated I'm going to be. I could be fine. But not only that but my wife, she has survived cancer during this time. Two weeks after we moved in, unfortunately, she was diagnosed with cancer. So we've had to keep an eye on her and we still keep an eye on looking after her." (P7 TH)*

In some households, the uncertainty of fluctuating or episodic conditions – such as illnesses with remissions, surgical recovery periods, or age-related decline, made specific planning more difficult. Even so, participants acknowledged that caregiving needs would likely evolve and were already considering how these changes might be supported.

Two households were preparing for intergenerational transitions of care. One older parent expressed concern about how their disabled adult child would manage in the future, especially when family support was no longer available.

> "We're downsizing *yeah, because I can't leave when I pass away. We can't leave [Participant's adult child] with everything." (P3 TH)*

6.2 Design features that indicated MDH as temporary

This section examines features of participants' homes that contributed to their perception of MDH as a temporary rather than a long-term home, including a range of design factors. As covered in the previous section on modifications, where possible, participants modified their homes to better suit their needs. The design features of MDH described in this section cover factors that prohibited modifications due to time or cost issues.

Whilst for most households the decision to move, or to plan to move after a short period of living in their home was due to a combination of factors. Difficulty with stairs and accessing toilets upstairs appeared to provide the most significant impetus to move.

> *"We're only really looking to be here for another couple of years…We'll probably try and find a smaller, a single level or maybe two level home." (P7, 3-storey TH)*

6.2.1 Stairs

Most participants in terraced houses reported difficulty with stairs. As was discussed in section 4.1.2 and section 5.3.4, stairs posed issues for many participants, with one participant privately paying for and installing a stairlift. When asked if there was anything they would change about their home, one household responded:

> *"Well it's just more the fact that it is a third level whereas maybe a single or a double may have been easier, or in the future…Yes, definitely. Single or double, not three [storeys]." (P7 TH)*

This household residing in a 3-storey terraced house considered not using the top floor of their home. This illustrates the degree of compromise households make to accommodate their disabilities within their homes.

> *"I mean we could live in just the bottom floor here and the second floor and close the top off, don't use it…. But then again, there's some nice rooms up there, it's comfortable, the sun shines there when you want it." (P7 TH)*

For another participant, a future home was desirable if it was on a single level, or at least allowed day-to-day activities to be completed on one level.

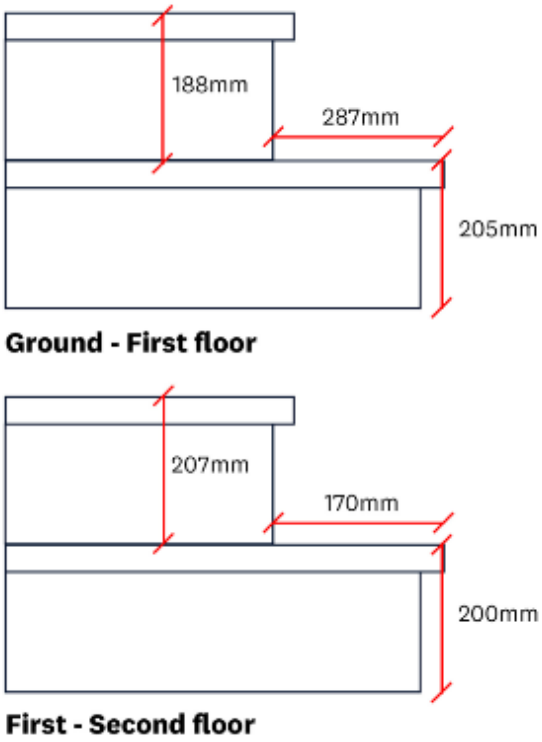
> *"I think if we do manage to find another place, it would be, we would be looking for a single level or one where you could comfortably live on a single level, even if there's another level." (P9 TH)*

One participant liked the kitchen and living being located on the 2nd level, though reported challenges in bringing shopping and groceries upstairs.

> *"I like the kitchen and living in the middle [level]…but it is hard to get up things up." (P3 TH)*

Another participant reported falling on their internal stairs and needing to be very careful at all times. They also reported that one flights of stairs was steeper than the other. This highlights, when providing more than one flight of stairs, it is essential for the stairs to have the same dimensions. When walking up or down stairs people develop a stepping rhythm; a change to that rhythm can put people at higher risk of falls (Auckland Council, n.d.).

Figure 77: On-site measurements of P3's stairs



"I did fall down the stairs. I hurt my foot when I did that too.... Some of them [stairs] are steeper than others, steeper than those ones" (P3 TH)

This participant also conveyed difficulty using the handrail by the stairs at times due to muscle spasm associated with their disability. Not having handrails on both sides of the internal stairs does not give the participant the option to use their other arm for support when needed.

6.2.2 Toilets

Several households reported significant difficulties with no toilet facilities on the middle storey of a 3-storey terraced house, or on the ground level of a 2-storey terraced house. Participants remarked that this was becoming increasingly difficult to manage as they got older, whilst another, with a progressive condition, believed it would become an issue in the future.

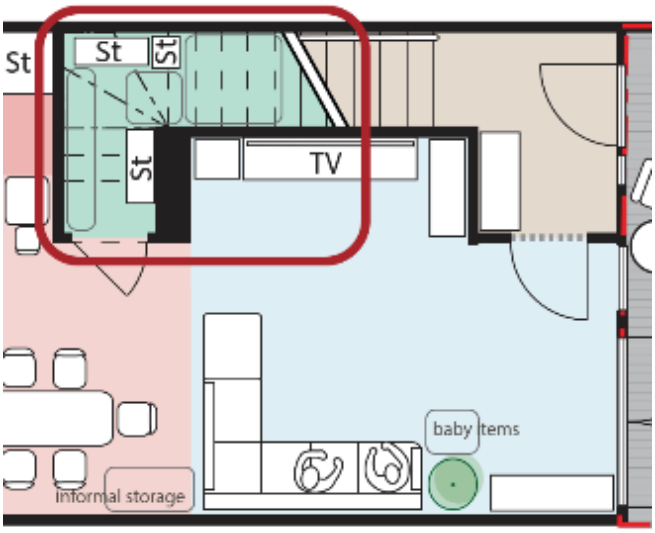
> *"We don't have a toilet on this floor... So, the main reason for moving up or down is because you want to go to the loo... Well for me at my age..." (P7 TH)*

> *"I don't think we could live here long term just because it's two level and there's no bathroom downstairs. Like I don't want to age in a house that has stairs, hopefully, like I wouldn't want to. I think, with time, it's going to become an issue." (P9 TH)*

Those in 3-storey terraced houses did not see this as something that could be changed or modified, whilst the participant in a 2-storey terraced house wondered whether the downstairs storage under the stairs could be modified into a small toilet.

Figure 78: Understairs storage (P2 TH)

Figure 79: Location of understairs storage on ground floor (P2 TH)

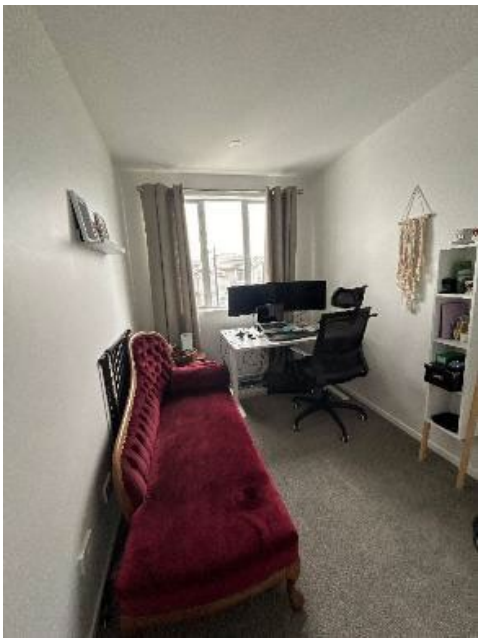


"I didn't show you under the stairs too... [For] the first house and the last house, this is a toilet for them... Sometimes it would be nice to have a toilet downstairs." (P2 TH)

6.2.3 Space

For some participants, the short-term nature of their tenure was driven by the needs of a growing family. Here a participant discusses the smallest bedroom in their three-bedroom terraced house:

Figure 80: Third bedroom being used as a study due to its small size (P2 TH)



"I think if we were to have a second child, we probably wouldn't stay. I don't think you can make this a room; I wouldn't put my son in here. Like even nowadays in a cot, I still wouldn't. I still wouldn't put him in this room." (P2 TH)

One household wanted to move to have extra space indoors for cooking and for accommodating visitors and family, as well as a better working from home space.

> *"I'd make it slightly wider. Yeah, I mean the kitchen we would prefer to have more like a corner kitchen with an island and a bit more space" (P9 TH)*

> *"It's like a bit small. We would like to have an extra room, so we will probably move out of here in the next year or two, hopefully." (P9 TH)*

> *"My family wants to come to visit me from [another country] and my mother's like, where am I going to sleep. (Laughter) So I said, well I'll put you on my bed and we will sleep on the floor somewhere, which is not great for his, like I think about putting him and his [health condition] on like an air mattress thing, which is not great." (P9 TH)*

Their home was unable to be modified as desired for extra space.

6.3 MDH as a long-term home

Disabled people have a widespread preference to remain at home for as long as possible – or to "age in place" (Plouin et al., 2021). For some participants, MDH was chosen to meet their disability and long-term daily needs. These households generally chose apartments and believed that these homes would meet their future needs. For households that were previously living in standalone housing, their new home was often a downsize in terms of overall space with lower maintenance requirements.

The following section examines features of participants' homes that contributed to their perception of MDH as a long-term solution, including step-free, offering accessible carparking, and providing access to outdoor spaces and support services.

6.3.1 Step-free

Participants believed designs which eliminated or minimised steps – including step-free routes and entrances into the home, promoted their ability to remain in the home long term.

> *"I'm gonna stay here till I cannot do anything because everything is one level. You know, it's safe." (P1 AP)*

For one participant with a progressive condition, the lift was an essential parameter of their decision to move into their apartment.

> *"Well, it had to have a lift…Our previous house had a staircase going to the basement, garage, internal access, yeah, so that was getting a bit problematical. It wasn't, yes, I've got a lot worse since, I might add, but at the time. So we knew our days were numbered there, so we knew we had to move from there." (P8 AP)*

For a participant with hearing impairment, the fact that the apartment was all on one level meant that communication was easier.

> *"One level too, you know? So you're not chatting [or shouting] up the stairs." (P1 AP)*

Level access showers or showers with a small threshold lip were also reported to be beneficial for ageing or when their health or disability changes over time. One participant whose shower had a small lip stated that:

> *"Everything's easy to get in and out of, the shower has only got a little lip on it. And I am actually pretty good when I like when I had my knees [operated on]." (P6 ST DU)*

Figure 81: Shower with a small lip (P6 ST DU)

For a participant with a progressive condition their home ticked all the boxes; single-level living was particularly important to them and their spouse.

> *"Single level living was important to us...If I won 30 million in the Lotto, I might find something I like better than this. (Laughter) But given our current, given our whole situation, we couldn't do better than this." (P5 AP)*

They also commented that the design of their apartment was age-friendly, which was reflective of the demographic of the area in which they live.

> *"These places are designed for largely people our age or older to live in, so there's plenty of space ... And then more people with mobility issues would live in this area." (P5 AP)*

6.3.2 Carparking

Some apartments provided accessible parking in a dedicated visitor parking area. For those participants, it meant host visitors with accessibility needs or use the carpark themselves for pick up/drop off purposes now or in the future.

Figure 82: Unallocated accessible parking at apartment building (P8 AP)

Figure 83: Unallocated accessible parking at apartment building (P1 AP)

A participant with an accessible parking permit parked their vehicle in the allocated underground parking. Whilst not marked as an accessible carpark, it was level, slip-resistant and had sufficient manoeuvring space to enable the car doors to open fully.[44]

One household, which had two carparks, but no accessible carpark, used both for one car to enable car doors to open fully. Opening car doors fully enables easier transfers in and out of a car as well as easier placement and use of mobility equipment.

Figure 84: Two allocated underground parking spaces used to park one car (P5 AP)

"This is our carpark. We park over the two." (P5 AP)

[44] Photo of car with parking permit not shared for privacy reasons.

6.3.3 Outdoor spaces

Connectivity to nature is seen as a key element of liveability in medium and high-density housing (Reid et al., 2021). Accessible outdoor areas were provided in all three apartments in this study with decks or balconies. Communal outdoor living spaces were also provided in the apartment complexes, but not in the terraced housing for participants in this study. As discussed in Section 4.3.4, access to the outdoors was considered important for all of the participants.

Figure 85: Accessible communal outdoor living space. (P1 AP)

Conversely, for the majority of participants living in townhouses, the lack of safe and accessible outdoor areas was an area of discontent, to which several participants made extensive modifications, to better suit their and their whānau needs.

6.3.4 Support services

Participants who believed MDH would meet their long-term needs also reported the ability to access nearby social supports. They reported having good relationships with their neighbours and within the larger development, as well as having access to friends and/or family nearby.

> *"One thing that's improved with this area is the motorway. It's made a huge difference. Huge difference to people like me that just like to go out at night. I have my friends that I meet up with them." (P6 ST DU)*

Households' proximity to a range of amenities, including health care and services that promote wellbeing, was also linked to a positive mindset associated with staying in their home.

> *"There's a lot of really good wellness people up here." (P6 ST DU)*

"I think with my health, I can't, we couldn't go into the country [live rurally] again. Like I need to be where I know I can get to the doctors…We do appreciate living in Auckland and having access to four or five specialists, having them available." (P5 AP)

"And fortunately, [my paid caregiver] lives only a few houses away. It's ideal." (P10 TH)

For one participant, who balances school requirements of one child with autism with their sibling's, proximity of public transport to different schools was seen as beneficial for staying in their home long-term.

"I like this place for train and buses and the bus is just like here and there… We can access a means of transportation for future if they go to high school or [specialist school], for my other son." (P4 TH)

For another participant a paid carer was reported to be a good long term support.

"[Participant name] has a friend [carer] that comes out every fortnight now… So we've left the chair up here for his mate to be here. Yeah. Oh, he does the carer support with him…Thankfully, we're still allowed to claim that." (P3 TH)

Many households that indicated their home would meet their long-term needs had an additional room for a caregiver to stay over for several nights. For example, one participant who has had a hip operation for arthritis and may require the same operation for the other hip in the future, had her daughter stay in a spare bedroom post operation to provide support.

"When I had my hip operation… my daughter she came out… so she could do stuff for me". (P6 ST DU)

6.4 Conclusions

All households in this study were thinking and preparing for the future to some extent. For some, this meant considering who would care for their disabled family members when they were no longer around, for others it meant considering what their needs might be as their disability changed over time or with ageing. Generally, those participants living in apartments felt that their home would meet their disability related needs long term. However, for many participants in terraced houses, the length of tenure was shorter than they anticipated because the home failed to meet their long-term expectations or needs.

For some households living in MDH reprioritised what was important for them and their disability-related needs, and this knowledge formed the basis of what they would seek in their next home. For others, moving home was not a feasible option, so they would make compromises and use the resources that they had to make the home work for their household as best as they were able.

7 Recommendations

This report draws on existing literature and community perspectives to outline key factors that shape the experience of disabled individuals living in MDH. The following considerations emerged as critical areas for future development of housing and housing policies:

- Future-proofing housing developments – embedding adaptability and flexibility to accommodate changing accessibility needs over time.
- Understanding trade-offs and compromises that disabled people and their whānau make – the geographical and resource-limited nature of housing decisions.
- Incorporating disability and accessibility in urban planning – ensuring accessibility is integrated into decision-making processes and policies.

By incorporating these considerations at the master planning stage, Auckland's housing developments can move towards a more inclusive and sustainable model that meets the needs of all residents, including disabled individuals and their whānau.

Based on the findings and analysis this research offers a range of recommendations for Auckland Council. Implementation of the recommendations will also be beneficial for the housing sector in general (e.g. regulators and developers) to improve future quality and delivery of MDH in Auckland to meet the diverse needs of a growing population.

Recommend to:

- Consider the findings of this research in the upcoming Auckland Unitary Plan review and revisions to the Auckland Design Manual. The substantial findings hold a considerable impact on potential future planning decisions and subsequent changes to the Auckland Unitary Plan, even with the Resource Management Act reform currently under revision.
- Consider monitoring systems to ascertain whether MDH is meeting essential needs of the disabled population through dwelling design.
- Continue advocacy for inclusion of housing accessibility in the Building Act and Building Code to ensure New Zealand's regulatory system is safeguarding the needs of disabled people and the rapidly ageing population of Aotearoa. Clear and consistent standards and expectations for new housing design and construction are required.
- Develop a communications plan to share findings with Auckland Council staff and external stakeholders. It is vital that the Planning and Resource Consents department is aware of this research and potential impacts on planning and delivery of MDH. Internal stakeholders include the demographic advisory panels, specifically the Disability Advisory Panel and the

Seniors Advisory Panel. External stakeholders include the New Zealand Institute of Architects, Property Council and major housing developers.

- Support training initiatives in accessibility and universal design in housing for tertiary students in fields such as architecture, landscape architecture, occupational therapy, planning, urban design and related fields.
- Develop tools to support the greater application of universal and accessible design into MDH for Auckland Council staff and other design professionals. This includes input to MDH guidance, development of case studies, and development of design checklists to enable MDH to better meet the long-term needs of Auckland's diverse population.

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9 Appendices

9.1 Recruitment screener questionnaire

Kia ora

Thank you for your interest in participating in an interview about your home, we really appreciate it!

We are looking to invite a range of households to participate in interviews, so we will use the information you provide us with to invite participation from a diverse range of households. By completing this form, you are not committing to participate in an interview. If you have any questions or would prefer to complete this form over the phone, please get in touch at housingresearch@aucklandcouncil.govt.nz or call/text our researchers on [number].

Questions

What is your name?

First name	
Last name	

What is your home address?

What is your email address?

What is your phone number?

Who lives in your household? *Select all that apply*

I live on my own	
Partner	
Parent(s)	
Babies aged under 12 months	
Pre-school aged children	
Primary school-aged children	
Secondary school-aged children	
Adult children	
Other adult(s) e.g. flatmates, boarders, cousins, siblings, friends	
Someone else, please describe	

As you indicated on your online survey last year, that you and/or someone in your household had a disability or health condition affecting your/their day to day living.

Do you have a disability or long-term health condition that impacts your day to day living?

Yes ☐

No ☐

Does anyone else in your household have a disability or health condition that impacts their day to day living?

Yes ☐

No ☐

Please describe your relationship with the person/people in your household who has/have a disability or health condition that impacts their day to day living? For example, are you a parent, career, sibling, flatmate.

It is important for the researchers to gain an understanding of this disability or health condition for a range of experiences to be represented in the study. Please describe the long-term disability or health condition(s) (lasting 6 months or more) that you or one or more of the household members has?

How long have you lived in your home?

Participating in an interview involves two researchers coming to your home for about two hours. We will have a conversation about your home and how you live in it. We would like you to take us on a tour of your home, so you can explain to us what you like/don't like about your home. We are interested to learn about details of your home and would like you to show us all of your home including bathrooms, bedrooms, garages, inside cupboards, and outside areas.

Would you be comfortable participating in this interview?

Yes ☐

No ☐

As part of the tour of your home we would like to take some photographs. These photographs will document design features of your home and how these make living in your home easier or harder. These photos and the data that we would collect with them, would be used to discuss how people experience living in medium density housing. We will make sure the photos do not include you or other members of your household without your express permission or features that could identify you and where you live. Are you okay with photographs being taken inside and around your home?

Yes ☐

No ☐

We welcome all members of your household to participate in the interview, including any children who might like to show us around their rooms. Please describe which (if any) members of your household would like to participate:

Carers and support people who are not part of your household are also welcome to assist with participation. Would you like to have a carer or support person present?

Yes ☐

No ☐

Not sure ☐

Our researchers want to make sure we are respectful of you and any pets or service animals in your home. Are there any pets or service animals in your home?

Yes ☐

No ☐

Please provide details of any pets or service animals

Interviews will be happening in February and March 2023. When would you be

Interviews will be happening in March and April 2024. When would you be available to participate in an interview? *Please select all that apply*

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Morning (9am– 12pm)						
Afternoon (1pm – 5pm)						
Evening (5pm – 8pm)						

Is there anything else you would like to tell us about yourself or your household? (E.g. preferred pronouns, accessibility considerations, or different languages spoken in the household – for example New Zealand Sign Language, Te Reo Māori)

Thank you for completing this form! We will be in touch!

If you have any questions or would prefer to complete this form over the phone, please get in touch at housingresearch@aucklandcouncil.govt.nz or call our researchers on [number].

9.2 Discussion guide and observation schedule

The sequence of questions below is a guide for how discussions with interviewees will proceed. The order of questions and which questions asked will be dependent on the context and configuration of the household and structure of the house. Indications of the how we have linked the questions to the conceptualising of the data that we are interested in are included.

Introduction script at the beginning of the interview:

Thank you for your time today.

Introductions:

I'm [name of social science researcher] and this is [name of design researcher].

We are from Auckland Council, and we are doing the study to understand how Aucklanders experience living in their homes

Can you please introduce the household members that will be joining us today, as well as those that may be present in the house but not joining the conversation?

Overview:

Our thinking is that we will start sitting here having a conversation. I have some questions here to guide our conversation [introduce clipboard and DG], then I would like to ask you to take us on a tour of your home and we would like to go through room by room, led by you. If it is okay, I would like us to stop in each room/space and talk about what you do in that space/what it is used for, what is working well and not so well. I'd then like us to go outside to see where your rubbish bins are and where you store any vehicles and any spaces you share with your neighbours. We will come back here to wrap up our conversation.

We are really interested in understanding how you live here, what is working well and not so well. The purpose of our research is to understand how well homes are being designed and built for people to do the things they like or need to do. In our discussion with you we will explore how you go about, say doing laundry, to see how easy or difficult this might be and if you have any strategies or "hacks" to make this work better in your home.

Introducing consented plans:

From our council records we have a copy of the building consented plans of your building [show on tablet/print out]. We think this is your home here, does this look right to you? [position participant as the expert of their home]. We would like to make some notes on here about where you have furniture and what you have in cupboards, or where light switches are for example. If you have made any changes to the interior of your home, like the size of a kitchen bench or location of cupboards, we would like to note that as well and hear about how that came to be different, if you know. So this is not a 'check' in any way, we are just interested in any changes that have been made, and to get you to talk through why you did those so we can understand more about how you live here. We might eye-

ball some measurements as we go around the home tour too if something looks different to what is in these plans, how would you feel about that?

Introducing photos and consent for photos:

[Name of design researcher] would like to take photos of your home while we are here. We would like to photograph things like how you use the storage you have, how the lighting works in your home, or what your laundry and rubbish systems are, or how your car/bike storage works. Photographs are really useful records of design features in your home, so it would be great if you pointed out things that you think are relevant that we should record. You can also tell us not to take certain photos as well, that is not a problem. If we think it would be good to take a photo of you, we would do so in a way that ensures that you can't be identified, for example taking the photo from the back with anything identifying blurred. For example, it could be really beneficial to get a photo of you moving through a doorframe with your assistive equipment, to show that it is a tight squeeze. If you are not comfortable being in any of the photos, that is completely fine, and we will not take any photos with you in them. We won't take images of other things, such as family photographs, that could identify you. We will also share all the photos we take with you after the interview so you can review them and tell us to delete the ones you are not comfortable with or blur/crop photos if that is preferred by you, we would need you to do this within two weeks of us sending them to you.

Introducing what we do with the data:

After our session today we will combine your thoughts with others that we interview and write a report on our findings, and we might do presentations and write academic articles using the data as well. We will use some quotes in our report, but we will use a pseudonym or fake name of your choosing, so that you cannot be identified. This report will be published on the Knowledge Auckland website, which anyone can access. We hope the information from our study will help inform future housing developments and to improve the overall quality of medium density housing.

I'm turning on the voice recorder now and [name of design researcher] will start taking photos if that's ok by you.

One last thing before we get into the questions is the consent form(s) we would like you to sign. There is a possibility that another team in Council may want to create case studies for the Auckland Design Manual. If you want your home to be considered to be included in the Auckland Design Manual in this way, tick this box. If this use of your data becomes a possibility, we will come back to you and explain more about what that would look like and go through another consent process.

[Ask them to sign the consent form(s).]

Preliminary discussion about household and dwelling

Living arrangements

- Tell us a little bit about your household.
- From the survey you filled out you told us [x] number of people live here [to confirm this]
- From the survey, you told us that you own/rent, is that correct?
- From the screening questionnaire, you told us that household member(s) have (x) as a long term disability/health condition, is that correct? Can you briefly tell us about how this impacts on their day to day living for example, moving around within the home, preparing a meal, etc?
- How long have you lived in your home?
    - Brief history of living in this home
        - Where were you living before?
        - What made you decide to move?
        - Why did you decide to move here?
- Were your expectations for this home met once you had lived here for a while?
    - Prompting understanding of expectations aligning w/ needs;
    - Understanding any trade-offs about choice vs affordability.
- Tell us about the location of your home and how this affects your experience of living here.
    - Probe for role of bigger community in participants life and how this affects the experience piece.

Great! Now we would like you, [or someone in the household – if for some reason the main participant would prefer to not take part in the tour, for example if they have significant mobility difficulty/are in a hospital bed, etc] to take us on a tour of your home.

We will be guided by you. We would like to pause in each room or space to hear about how that space is used and ask some questions about different things like how you use that space, and what works or doesn't work about it. We would love for you to show us inside wardrobes or cupboards and hear about how the storage of spaces is working.

We would love for you to point out particular features of your home that you like or don't like and that we can photograph so we can record it.

- Car parking: if any provided/communal parking
- Front access: including access from footpath, presence of any stairs or ramps, handrails
- Main hallway: including circulation space, flooring, lighting, storage
- Living areas: including circulation space, furniture placement, lighting, flooring, fixtures
- Kitchen and dining: including circulation space, access to appliances and counters, storage
- Toilets and bathrooms: including any modifications completed/proposed, doorways, circulation space, lighting, tapware and fixtures, assistive equipment
- Bedrooms: including doorways, flooring, lights, fixtures, circulation space and storage
- Laundry: including access to appliances, storage
- Heating/cooling: what system in place, any changes introduced
- Internal stairs: if any present, handrails, lighting

- Other spaces: such as spare rooms/office/additional storage
- Outside spaces: including access to deck/clothesline/rubbish, etc.
- Communal spaces: including access, seating, etc.

Home tour general questions

Interior spaces

- Tell us about what this room/space is used for?
- What do you like about this space? Dislike about the space?
- What activities do you do in this space? What about the spaces makes that work well/not so well?
- Have you made any changes to this space?
- What could make this space better if time/convenience/money were not an issue?
- Do you have any strategies or "hacks" to make this work better (e.g. combining with other activities, doing at a particular time of day, groceries delivered)
- Tell us about having people/family over/ socialising in this dwelling?
- Can you show us how you organise the space to do this?

Exterior spaces

Let's go to the outside areas of your home now and the communal spaces of this building. Now, we might run into one of your neighbours while you are showing us these spaces, how would you like us to respond to them? We can simply say we are doing research on living in [terraced houses/duplexes/apartment] if that works for you?

Show us your outdoor space/s:

- What about your outdoor spaces works well? What would make it better?
- How do these spaces compare to other homes where you have lived previously?
- What activities are you able to do in this space?
    - Are there any activities you would like to do, but you are unable to?
- Show us how you make this patio area work for you
    - Probe for issues around part of space taken up by a garage shed, heat pump unit, clothesline, etc.)
- Do you find that your outdoor space receives enough sunlight at the right time of the day when you are wanting to use it?
- How easy is it to maintain your outdoor space?
- What features do you wish your outdoor space had (e.g. more planting/trees/grass; space for trampoline, shade etc)
- Tell us about privacy in this [specific outdoor space]
    - Have you done anything to make it more private? e.g. additional fencing / screening / planting).

- Any concerns with noise/privacy conflicts with neighbouring properties?

Show us the spaces in your home that you share with your neighbours – living spaces, carparking, driveways, garaging, storage, bin room, mailboxes, walkways/stairs, shared facilities like lighting:

- How often do you see your neighbours in these shared spaces?
- How often do you use shared spaces, what are they used for?
- What works well about sharing these spaces with other people? What, if any, challenges are there, and how could they be improved?
- How well are these spaces maintained? Is there a residents/incorporated society or body cooperate that manages the communal spaces? What financial contribution do you make to management of these spaces?

Show us where you store your car/bikes:

- What about this carparking/bike storage works well? What would make it better?
- How far is your on-street parking from your home?
- How much parking is available for people in your household? How much is available for visitors to your home? How well does this work?
    - Prompts: availability of on-street parking, safety, accessibility issues, carrying groceries/children, convenience, etc.
    - Drop a pin at parking spot and work out distance in metres would be useful.

For complex/apartment:

- How safe do you feel pedestrians are here? What about this space makes you feel that way?
- Have there been any instances of emergency services needing to visit your property or surrounding properties?
    - If yes – were they able to find you easily, how easily could they access your property/the area?
- Talk us through the mail and courier delivery systems. Do you find that couriers and other delivery services can find their way around the development easily and locate individual units or dwelling?
- Talk us through the way you would get a new bed/refrigerator into your home.
- Tell us about maintenance of your home and the building/complex you are in?

Wrap up

Thank you for showing us all of that! Let's head back inside for the wrap up.

- Is there anything that I haven't asked you about that you expected me to ask, or you haven't had the opportunity to tell me about?
- If you could wave a magic wand and end up having this home be absolutely perfect for you, what would be changed as you waved that magic wand around?

Ok, we have come to the end of the interview. Here is your Countdown Gift Card, thank you so much for your time and your insights, we really appreciate it!

[Turn recorder off]

2. OBSERVATION SCHEDULE

- The ways human and non-human inhabit the spaces in the dwelling
    - How people and pets use the spaces in the dwelling
    - The way the inhabitants of the dwelling sit/exist/live in relationship with each other within the various spaces the dwelling, as well as the adjacent outside spaces that are used in the process of living in the dwelling.
    - How relationships are facilitated/curtailed/inhibited by design features in the spaces of the dwelling
    - How the inhabitants of the dwelling exist in relationship to the adjacent dwellings and their neighbours
- Physical layout of the dwelling
    - Light/darkness in the house
    - Proximity of different types of spaces and how separations/integrations are achieved/not achieved.
- Physical layout of the furniture and the fixtures in the dwelling
    - Types of furnishings, furniture, and other objects
        - number of cupboards and drawers within kitchen
        - Number of wardrobes
        - Number of any additional storage cupboards
        - Architectural screening devices
        - Landscape treatment & fencing
    - How humans and non-humans interact with the furnishing, the furniture and other fixtures in the dwelling.
- Inside design features of dwelling and the way people/pets interact with these
    - The way inhabitants use specific design features.
    - Issues/challenges created by design features.
- Objects that make the dwelling 'home'.
    - How the inhabitants of the dwelling interact and perceive these
- Outside design features of dwelling and the way people/pets interact with these
    - The ways inhabitants use and exist in the entrance spaces, the auxiliary spaces like carparks and rubbish areas etc.

3. PHOTOGRAPH SCHEDULE (examples, not all types of photos may be taken)

- Photos of front and back of dwelling (e.g., from street or shared driveway and from private rear outdoor living court) showing all levels, also showing proximity to other dwellings
- Photos of landscape treatment/threshold at the entrance to the unit
- Photo taken from inside dwelling looking through main window that either faces the street or shared accessway (trying to get a sense of degree of overlooking provided to shared accessways – safety)

- Photos of each room in dwelling & storage provided in each (including any additional storage created) – ideally including a photo inside cupboards etc.
- Photos of any stairs or ramps inside or outside of the dwelling
- Photo of outdoor living space including any plants or trees and site facilities such as – hot water cylinder, storage shed, rainwater tank, rubbish bin storage, washing lines, heat pump units etc
- Photo of fencing / landscape treatment to outdoor living space and unit, and any modifications made (e.g., additional fencing / screening elements)
- Photos that demonstrate any privacy conflicts with overlooking of private outdoor space e.g., from / to neighbouring dwelling
- Photo of either individual or communal waste storage area
- Photo of key characteristics of shared accessway (vehicle and or pedestrian) including footpaths, parking, landscape treatment, lighting, wayfinding signage etc
- Photos of any shared facilities such as communal outdoor (or indoor) spaces and associated planting, gardens, swimming pool, community rooms, gyms, storage etc
- Photos of any modifications made to home (indoor or outdoor) including additional storage, conversion of garages, accessibility modifications
- Photos of assistive equipment (with explicit permission to photograph these)
- Photo of where car(s) are parked & any EV charging provided
- Photo of where bicycles are stored
- Photo of where any bulky items are stored – sporting equipment, suitcases, hobby gear, children's toys etc
- Photos of any grouped carparking areas / on street parking / disability parking
- Photos of any part of the dwelling where occupant identifies an issue with quality or functionality or solar orientation.

9.3 Participant information sheet

PARTICIPANT INFORMATION SHEET

Auckland Council

Auckland Council Housing Research

What's the research about?

This study is led by the Tamaki Makaurau Design Ope and is supported by RIMU (the Research and Evaluation Unit at Auckland Council). It explores the experiences of disabled Aucklanders and their whanau living in their homes.

This research has been assessed and approved by the Aotearoa Research Ethics Committee (AREC23_57).

Who's being invited to take part?

You are being invited because you completed the Auckland Housing survey, and you indicated you would like to participate in future research.

What are you asking me to do?

Two of our researchers would like to come to your home to interview you and other interested members of your household (this might include any children in your home). Everything that you share with us will be confidential.

We will ask you to take us on a tour of your home and show us how you use different rooms. We would also like to take some photos of different parts of your home and features that work well or don't work well for you. We won't take any photos that might show things that can identify you and your household.

What will you ask me?

We'll ask you about your experiences of living in your home, including what you like or dislike about it, the way you use different spaces, and about any changes you've made to your home to make things work better for you.

Before we talk, we ask all participants to sign a consent form. If you have children under 16 in your home and they would like to take part, we will ask their parent/caregiver to sign an assent form on their behalf. We do this to make sure everyone understands what it means to take part in this study. You can pause or withdraw from the interview at any time.

We will also ask if we can audio-record our interview.

How long will it take?

Our interview will take around 2 hours.

Where will we talk?

We'll talk to you (and other members of your household, if they are interested) in your home. That way you can show us around your home.

Do I have to answer all the questions?

No, just tell us if there are any questions you don't want to answer.

After our interview, if you and your household change your mind about being involved in this research, please let us know. Because of our schedule, if you want to withdraw, please do so within two weeks after we talk. We have a koha that we will give you at the end of the interview, if you then decide to withdraw from the project, you still get to keep the koha.

What will happen with the information I give you?

After we talk, we'll change the audio file to a typed document of our interview. We'll store and protect all your information safely so no one except our research team can access it. We will also send you copies of all the photographs we take, and you can tell us if there are any you would prefer are deleted or edited such as blurred/cropped and/or not used in the research report.

The information you give us, including photos, will be combined with others and used in research outputs – such as a research report or guidance document. You won't be identified in any of these outputs, and we'll change any details that could otherwise identify you.

The technical report we will write will be publicly available on www.knowledgeauckland.org.nz. The findings will be used by Auckland Council to provide guidance on how homes are designed. We will provide you with a research summary and a link to the technical report once it's published.

There is a possibility that the Auckland Design Manual (www.aucklanddesignmanual.co.nz) might like to use some of the information you gave us as a case study. If you are happy for your home to be considered for this, you can opt in by ticking the box on the Consent Form. Any use of your information in this way will require a separate consent process so the research team will come back to you for permission if this becomes a possibility.

What if I still have any questions?

Please ask us any questions you have.

For more information email Elise Copeland elise.copeland@aucklandcouncil.govt.nz or call **021894837**

If you have any questions or concerns about the conduct of this research, please contact the Manager of AREC, Dr Keely Blanch, on manager@aotearoaresearchethics.org

9.4 Consent and assent forms

CONSENT FORM

Auckland Council Housing Research

This study explores the experiences of disabled Aucklanders and their whanau living in their home.

I know that:

- I can ask questions about this study at any time.
- I can change my mind about taking part by telling my interviewer.
- I can take a break or choose not to answer any questions I don't want to.
- My participation in this study and everything I say will be kept private.
- I can ask the research team to delete any notes, recordings, and images from the interview, or I can withdraw completely from the study up to 2 weeks from today. I will keep the koha if this has been given to me at the end of the interview even if I withdraw.
- The research team will take some photos of my home, which might be used in their research outputs – such as a technical report or guidance.
- There is a possibility that the information from this project might be used in other ways, including case studies in the Auckland Design Manual. This is a separate consent process, so the research team will come back to me if I would like my home to be considered for this.
- Information will be stored securely for 5 years, after which it will be destroyed.
- My responses will be combined with the responses of others in research outputs. The technical report that we will write will be publicly available on www.knowledgeauckland.org.nz
- My name and any other identifying features of my home won't be used in the research outputs.

CONSENT FORM

Auckland Council Housing Research

- **Please tick if you agree:**

- ☐ I have read the Participant Information Sheet (or a researcher has explained it to me) and have had an opportunity to ask questions
- ☐ I agree to take part in this study
- ☐ I agree to having this interview audio-recorded
- ☐ I agree to the interviewers taking photos of my home
- ☐ I would like my home to be considered for inclusion in the Auckland Design Manual as a case study. I understand that if I agree, the research team can get in touch with me to talk about this more at a later date.

- Name:
- Signature:
- Date:

This research has been assessed and approved by the Aotearoa Research Ethics Committee (AREC23_57).

If you have any questions or concerns about the conduct of this research, please contact the Manager of AREC, Dr Keely Blanch, on manager@aotearoaresearchethics.org

ASSENT FORM

Auckland Council Housing Research

This study explores the experiences of disabled Aucklanders and whanau living in their homes.

I know that:

- I don't have to take part if I don't want to
- I can ask questions at any time
- I can take a break and I can stop whenever I want during the interview
- I don't have to answer any questions I don't want to
- Everything I say will be private, and my name won't be used anywhere
- I can say no if I don't want the interviewer to take photos of my room

Please tick if you agree:

- ☐ The interviewer has explained to me what this study is about
- ☐ I agree to take part in this study
- ☐ I agree to having this interview audio-recorded
- ☐ I agree to the interviewers taking photos of my home

Name:	
Signature:	
Parent/guardian name:	
Parent/guardian signature:	
Date:	

This research has been assessed and approved by the Aotearoa Research Ethics Committee (AREC23_57).

If you have any questions or concerns about the conduct of this research, please contact the Manager of AREC, Dr Keely Blanch, on manager@aotearoaresearchethics.org

9.5 Transcriber's confidentiality agreement

Transcriber's Confidentiality Agreement

Project name:

Principal researcher/s:

I _____ agree to maintain full confidentiality in regard to any and all audio recordings and documentation received from Auckland Council related to their study of **project description**. Furthermore, I agree:

1. To hold in strictest confidence the identification of any individuals or groups that may be inadvertently revealed during the transcription of recorded interviews, or in any associated documents;

2. To not make copies of any recordings or transcripts, unless specifically requested to do so by the principal researcher;

3. To store all project-related recordings and materials in a safe, secure location as long as they are in my possession;

4. To delete all electronic files containing recordings or transcripts from my computer hard drive and any backup devices once they have been provided to the principal researchers.

Transcriber's signature:

Date:

This research project (XXX-XXX) has received non-binding advice from the Auckland Council Research Ethics Advisory Group. If you have any concerns about the conduct of this research, please contact RIMU's manager Dr Jonathan Benge at jonathan.benge@aucklandcouncil.govt.nz.

9.6 Floor plans

#P1 AP Floor Plan

Lounge - 8.5m²

Kitchen - 4.7m²

Dining - 4.8m²

Bedroom 1 - 10.2m²

Flexi Room - 4.5m²

Wardrobe - 1.2m²

Laundry - 0.5m²

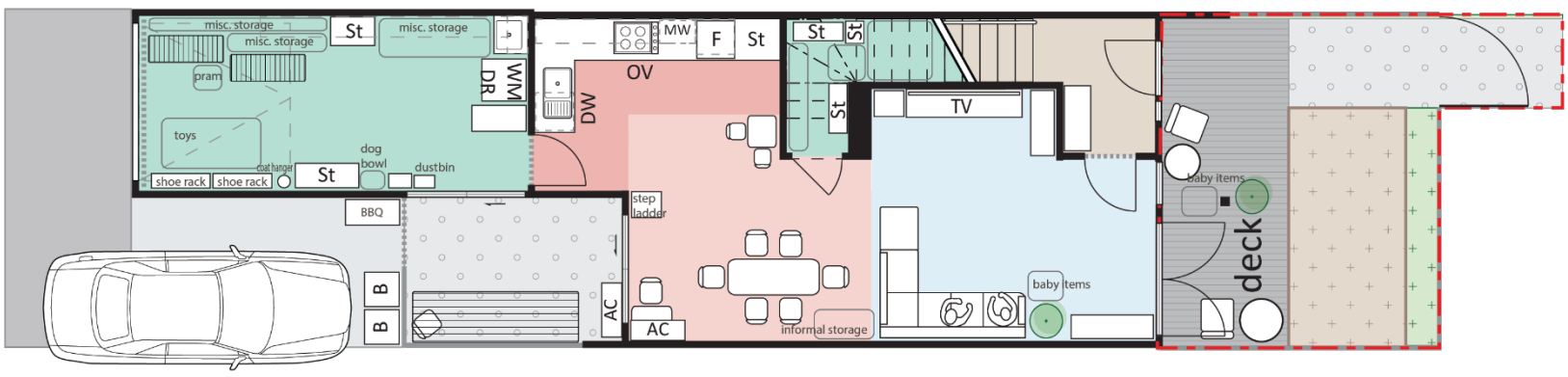
Bath - 5.1m²

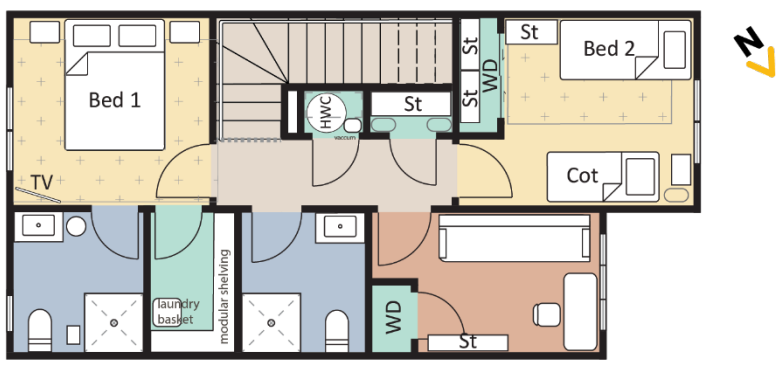
Circulation - 5.0m²

Total Floor Area - 44.5m²

Outdoor Living Space - 30.6m²

#P2 TH Floor Plan





Lounge - 16.4m²

Kitchen - 7.8m²

Dining - 12.7m²

Bedroom 1 - 8.7m²

Bedroom 2 - 9.2m²

Flexi Room - 6.7m²

Storage + HWC - 26.1m²

Wardrobes - 1.8m²

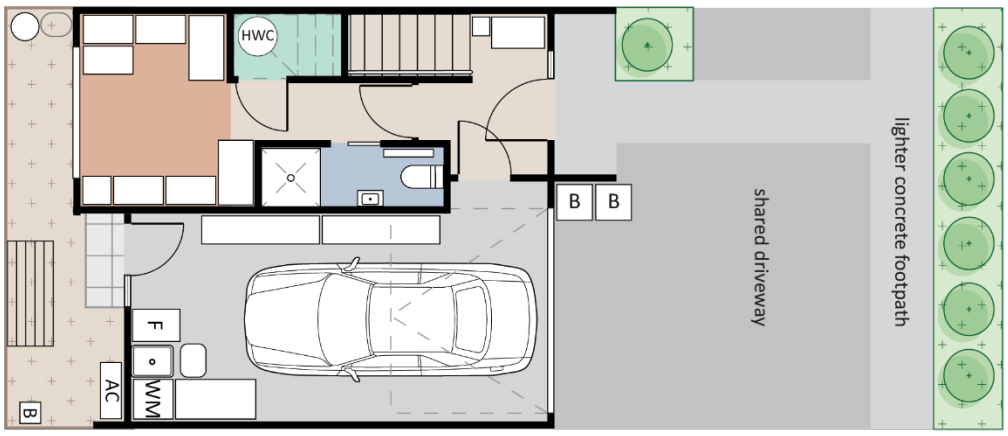
Bath - 8.0m²

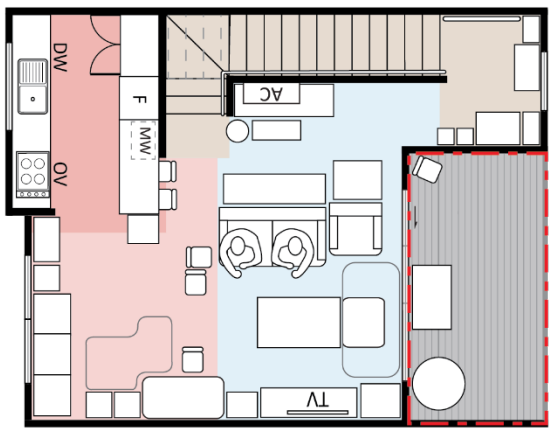
Circulation - 13.2m²

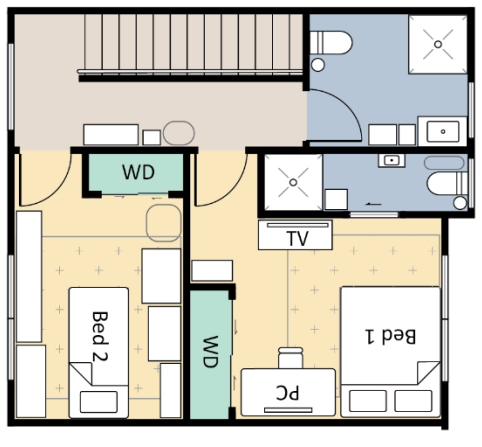
Total Net Floor Area - 110.6m²

Outdoor Living Space - 26m²

#P3 TH Floor Plan

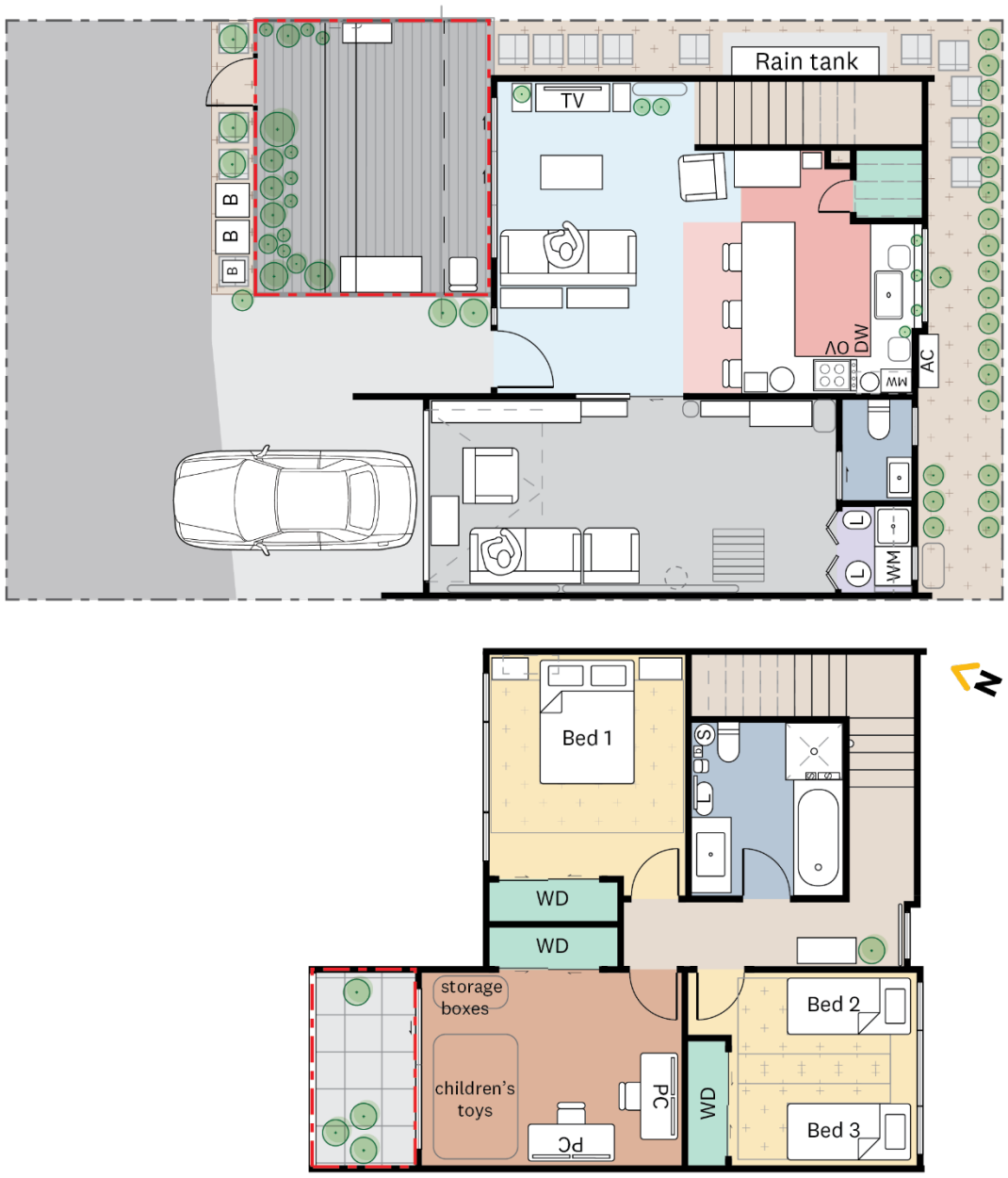






Lounge - 14.9m²	
Kitchen - 7.5m²	
Dining - 9.1m²	
Bedroom 1 - 11.5m²	
Bedroom 2 - 9.4m²	
Flexi Room - 7.2m²	
Storage + HWC - 1.7m²	
Wardrobes - 2.0m²	
Bath - 10.1m²	
Circulation - 25.4 m²	
Total Net Floor Area - 98.8m²	
Outdoor Living Space - 8.6m²	

#P4 TH Floor Plan



Lounge - 16.6m²

Kitchen - 9.0m²

Dining - 2.6m²

Bedroom 1 - 11.8m²

Bedroom 2 - 10.2m²

Study - 13.7m²

Storage + HWC - 1.1m²

Wardrobes - 4.1m²

Laundry - 1.7m²

Bath - 9.0m²

Circulation - 11.5m²

Total Net Floor Area - 68.2m²

Outdoor Living Space - 22.3m²

#P5 AP Floor Plan

Lounge - 19.4m²

Kitchen - 11.5m²

Dining - 10.2m²

Bedroom 1 - 15.6m²

Bedroom 2 - 10.4m²

Storage + HWC - 1.8m²

Wardrobes - 4.0m²

Laundry - 1.5m²

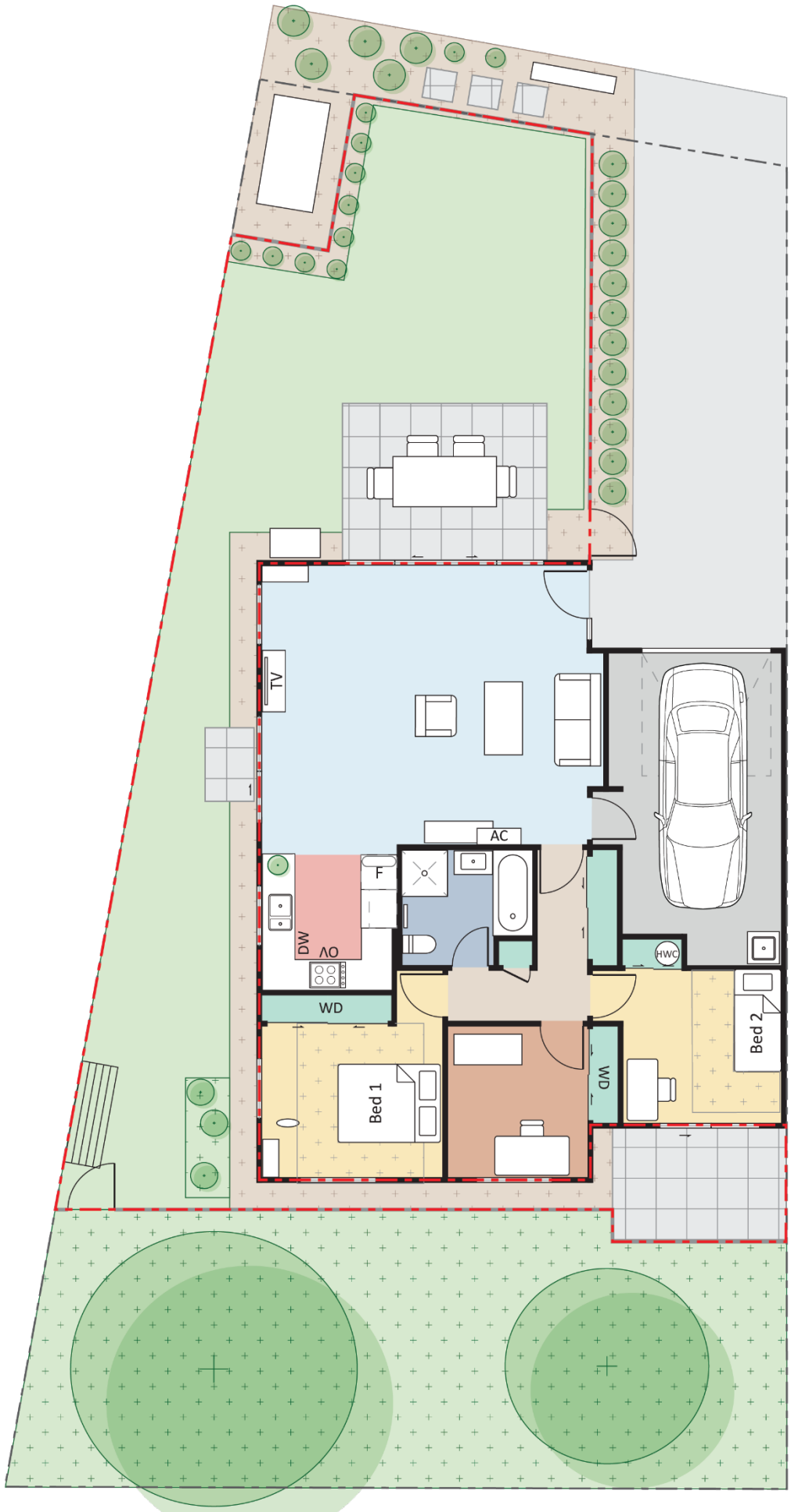
Bath - 8.5m²

Circulation - 11.1m²

Total Net Floor Area - 94.0m²

Outdoor Living Space - 15.7m²

#P6 DU Floor Plan



Lounge - 35.9m²

Kitchen - 2.6m²

Bedroom 1 - 11.4m²

Bedroom 2 - 9.9m²

Flexi Room - 8.1m²

Storage + HWC - 2.2m²

Wardrobes - 2.3m²

Bath - 5.3m²

Circulation - 5.2m²

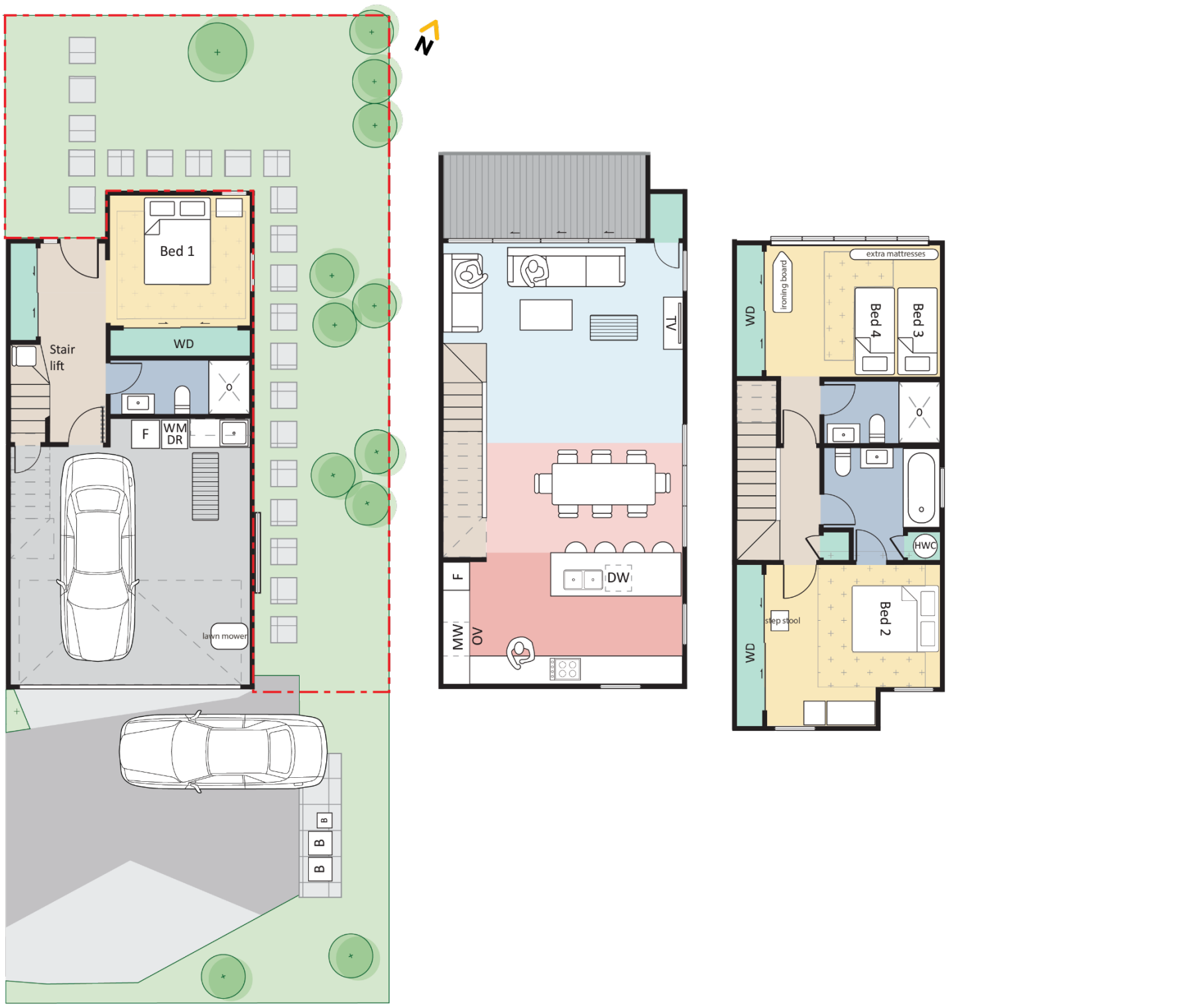
Garage - 19.5m²

Total Net Floor Area - 102.4m²

Outdoor Living Space - 106.0m²

0 2 4 6 8m

#P7 TH Floor Plan



Lounge - 23.1m²

Kitchen - 16.6m²

Dining - 11.5m²

Bedroom 1 - 9.6m²

Bedroom 2 - 13.8m²

Bedroom 3 - 12.1m²

Storage + HWC - 3.1m²

Wardrobes - 6.1m²

Bath - 13.7m²

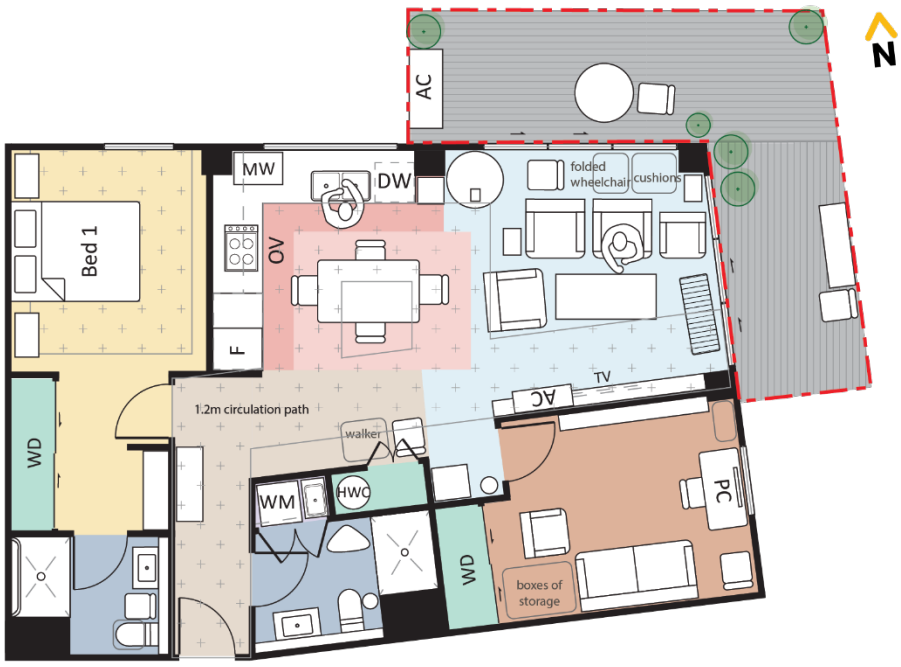
Circulation - 20.8m²

Garage - 32.3m²

Total Net Floor Area - 162.7m²

Outdoor Living Space - 74.3m²

#P8 AP Floor Plan



Lounge - 16.6m²

Kitchen - 6.7m²

Dining - 5.7m²

Bedroom 1 - 14.1m²

Flexi - 11.7m²

Storage + HWC - 0.9m²

Wardrobes - 2.9 m²

Laundry - 0.7m²

Bath - 8.5m²

Circulation - 8.8m²

Total Net Floor Area - 76.6m²

Outdoor Living Space - 20.9m²

#P9 TH Floor Plan

Lounge - 13.2m²

Kitchen - 7.6m²

Dining - 4.4m²

Bedroom 1 - 10.1m²

Flexi room - 8.9m²

Storage + HWC - 1.1m²

Wardrobes - 3.1m²

Laundry - 1.8m²

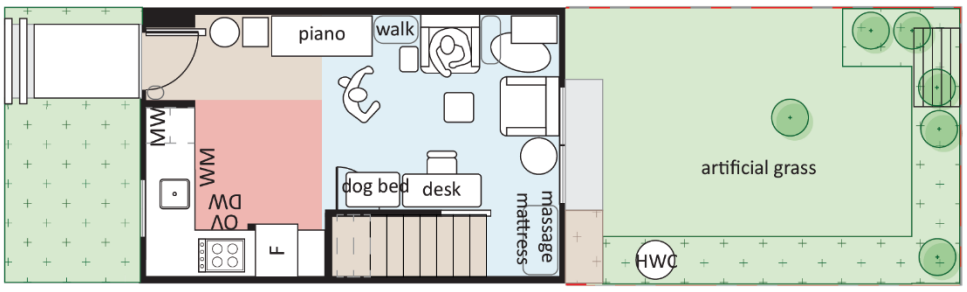
Bath - 6.8m²

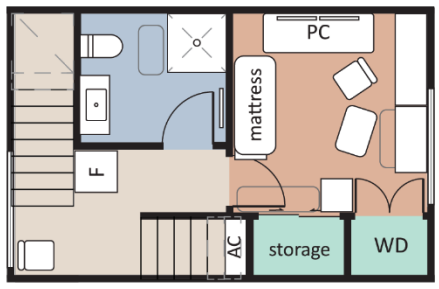
Circulation - 13.2m²

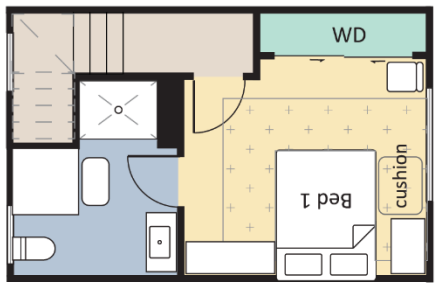
Total Net Floor Area - 71.1m²

Outdoor Living Space - 16.3m²

#P10 TH Floor Plan







Lounge - 12.2m²	
Kitchen - 7.1m²	
Bedroom 1 - 11.8m²	
Flexi room - 9.1m²	
Storage - 1.3m²	
Wardrobes - 2.5m²	
Bath - 10.5m²	
Circulation - 15.8m²	
Total Net Floor Area - 70.3m²	
Outdoor Living Space - 25.2m²	

9.7 Comparison of guidelines for accessible and universally designed homes

Area	Design elements	Auckland Design Manual (ADM)	NZS4121	KO Accessibility Policy [45]	BRANZ Universal Design for Houses	NZGBC LV1: Inclusive Design Credit	Australian Standard AS 1428.1 (2009)	NDIS Specialist disability Accommodation Design Standard	Your Home (2020)	Universal Design Guidelines for homes in Ireland
Access and entry external	entrance door		760 (min)			810 (min) 860 door leaf	850	850	870	800-900
	footpath width		1200		1200		1000/1200	1000/1200		900-1200/1800-2000/2000-2400
	footpath/accessway slope		1:20		1:20		1:20	1:20		
	ramp width		1200			1200	1000		1000	900-1500 (indivi.), 1500-1800 (communal)
	step ramp height							190 (max)		
	step ramp length							1900 (max)	1500 (max)	
	step ramp slope							1:10		
	ramp slope		1:12		1:12/1:15-1:20	1:12	1:14	1:14	1:8	1:12 (for 2m), 1:20 for (10m)
Living area	Rec. room dim	$20m^2$(1BD) $24m^2$ (2BD) $28m^2$ (3BD) 3.8m min width	3600 x 3600							
	turning circle		1200	1500 (AHS)				2250 (min)	2250	1500-1800/1800-2400
	circulation between furniture		500-900						1000-1350	750-800/900-1200
Dining Area	Rec. room dim	$10.8m^2$(1BD) $13.2m^2$ (2BD) $16.2m^2$ (3BD)	3000 x 3000							
	turning circle		1500							
	circulation		950-1200							1200
Bedroom	Rec. room dim	$9m^2$ + 3m min width	min 3000	$12m^2$ min (AHS)	2800 x 2600 min			3100x3100		$8m^2$ (single), $13m^2$ (double)

[45] The Basic Universal design category is shortened to BUD, and the Accessible Housing Standard category is shortened to AHS.

Area	Design elements	Auckland Design Manual (ADM)	NZS4121	KO Accessibility Policy [45]	BRANZ Universal Design for Houses	NZGBC LV1: Inclusive Design Credit	Australian Standard AS 1428.1 (2009)	NDIS Specialist disability Accommodation Design Standard	Your Home (2020)	Universal Design Guidelines for homes in Ireland
	turning circle		1500	1500 (AHS)				1540 x 1000	1550	2400 (any habitable room), 1500-1800
	wardrobe width							1400		
	wardrobe depth									
	circulation		900			800 (min)		1540x1, 1000x2	1000	800
Wet areas	shower		1000 x 1200		1000x1000 min/1200x1200	1200 × 1200 (min)		900 x 900/1160 x 1100	1160 x 1100	
	circulation space			1500 (turning circle, AHS)	1500		1900x2300	1900x2300		
	wash basin depth		400 (max)		125-160	400 (min)		430 (max)		130-150
	clear space urinal		760 x 1200			800 (beside/in front of urinal)		900 x 1200		
	bathroom area	$3m^2$ (1BD) $3m^2$(2BD) $3m^2$x2 (3BD) $3m^2$x2 (4BD)	1900 x 1600						2100 x 3400	1800x2000 (shower), 2500x2650 (bath)
	door width		760		810/860/910	810 (min)		820 / 900-950	820 (min)	
Kitchen	clear floor space/circulation		1500 (Min)	1500 turning circle (BUD & AHS)	1500	1200 (esp. btw two benches)		1000 - 1550	1550 (min)	1200-1500/1500-1800
	benchtop depth		600 (Max)					600 (min)	600 (Max)	500-600
	storage height				1200-1450 max				1200 (max)	
	shelf depth/width		300-400		300-600 (depth), 1000 (width)			600		300-400
	benchtop height		1175-1200		620-900					900-1100
garage/ carpark	clearance height		2500 (min)					2500 (AS 2890.6:2009)	2500	
	slope		1:50 max					1:40		
	length		5000 (min)		1700			5400	6000	5700 (garage), 4800 (on-site)
	width		3500 (min)		3500	3500 (adaptable)		3200 - 3800	3800	4200 (garage), 2400-3300 (on-site)

Area	Design elements	Auckland Design Manual (ADM)	NZS4121	KO Accessibility Policy [45]	BRANZ Universal Design for Houses	NZGBC LV1: Inclusive Design Credit	Australian Standard AS 1428.1 (2009)	NDIS Specialist disability Accommodation Design Standard	Your Home (2020)	Universal Design Guidelines for homes in Ireland
	garage door				3000 min					
Circulation	corridors		1200 (min)	1050 (BUD) 1200 (AHS)		1050 (min)		1000-1200		1050-1200/1200-1500
	length		1200 (min)							
	door width		760 (min)	860 (BUD)	800 min/910 min	810 (min)		820/900-950	820	800-850/850-1200
	stair width		900 (min)	1050 (BUD)		1000 (min)		1000		900
	stair riser		180 (max)							170 max
	stair tread		310 (min)							280-300
	Lift door width		900					900		950
	Lift car size		1400 x 1400/900x1400/900x1575					1100 x 1400		1100x1400 (3 storey), 1525x2030 (4 or more storey), 1800x1800
Power outlets	Power outlet location		Between 500-1200 above floor level	500 above floor level (min) (BUD)	Eye level/ approximately 1200 from floor	Between 900-1200		Between 600-1100 above floor level	600 above floor level (min)	Between 400-1000 above floor level

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