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Making New Zealand's built environment inclusive and accessible for everyone

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EXECUTIVE SUMMARY

New Zealand's built environment fails to meet the accessibility needs of people of all ages and abilities. Previous attempts to address the problem, such as the 2014 ‘New Disability Strategy’, have failed because of a lack of implementation, lack of understanding of the main challenges faced by users, and a lack of consultation with the very people whom the strategy aimed to help. The problem is further exacerbated by the building designers, builders and managers who do not know how different types of disability affect accessibility needs and how to make buildings more inclusive. They perceive the cost of accessible features as a barrier to their survival in a competitive industry.

This research was guided by a seven-member Accessibility Partnership Panel (APP), each member having a lived experience of disability. A survey of 319 New Zealand residents who experience disability showed that the ten least accessible building types are, in order of difficulty, sports stadiums, bars, boutique shops, public toilets, maraes, gyms, motels/hotels, dairies/small corner shops, bus stops, and theatres/cinemas. The top priorities for improving access depend on the types of disabilities experienced by the respondents:

- People with mobility impairments require doors that are easy to open, clear signage, uncluttered paths and ramps that are not too steep and positioned near the building entrance.
- People with vision impairments (blind or low vision) require better wayfinding features (simple navigation paths with audible or tactile navigation cues), better signage (large text with good colour contrast and braille) and high visibility doors.
- People with a hearing impairment (Deaf or hard of hearing) require visual/electronic displays of messages and proper provision of assistance for deaf people.
- People with learning, neurological, neurodevelopmental conditions (“cognitive” impairments) require better wayfinding features (simple navigation paths and clear signs), and control of the sensory environment, for example, with less noise, better lighting (with less glare, no flashing lights, and warmer colours).

Ten shops, ten libraries, and eleven restaurants were assessed for their compliance with NZS4121:2001. Larger shops were found to be more accessible than smaller shops; having better accessibility features, trained staff and allocated ‘quiet times’ with sensory control. Libraries were found to have good accessibility. Restaurants were moderately accessible for people with mobility impairments but failed to address the needs of people with other types of impairments.

New Zealand’s accessibility legislation is both outdated and vague, with many loopholes, and minimal enforcement. Legislators are aware that improvements are needed but do not know what the priorities are or what steps to take. The research findings were used to draft a petition, in collaboration with Access Matters Aotearoa, addressing these aspects and this will be presented to the New Zealand government in 2025.

A survey of 61 construction professionals showed them to have little knowledge of inclusive building design and to be reluctant to bear the financial cost of improving building accessibility. The perception of people working in buildings was similar; they were unaware of the accessibility challenges for people who experience disability and passive about changing the status quo if they had to pay for the provision of better access. The findings were used to create a 'Quick Fact Sheet' for construction practitioners. It lists a set of simple steps to make buildings more accessible and explains some common misperceptions about disabled people.

People who experience disability are part of society and it is society's responsibility to take care of them. Therefore, the cost of providing inclusive building access should be met by the New Zealand government, through taxpayer revenue, in the same way as other social programs such as pensions and health care are financed. If taxpayers were more aware of the needless trials suffered by disabled people in trying to access buildings and more aware of the likelihood that as they age, they too will probably experience access problems, they would support the use of their taxes to improve accessibility. If the government mandates provision of access and inclusion in the building design and provides subsidies to implement accessible features, the building professionals would be pleased to comply. The final step in improving accessibility is monitoring and enforcement. In order to operate, New Zealand's public buildings are required to have a Building Warrant of Fitness (BWOF), with critical features, such as the fire protection facilities and emergency lighting checked annually as a condition of the BWOF renewal. If the accessible facilities were added to the BWOF list, the problem of maintaining compliance would be solved.

An assessment was made of the potential economic benefit to New Zealand's tourism industry from increased access to public buildings for locals and international visitors. The survey of people who experience disability identified buildings such as sports stadiums, bars, shops, motels/hotels, restaurants and theatres/cinemas (all critical to visitor experiences) as some of the most inaccessible public spaces. The research showed that the accessible tourism market is sizeable and, with an increasing aging population, is predicted to increase rapidly in the future. Providing a built environment that meets the needs of the accessible tourism market is an enormous business opportunity for New Zealand's tourism sector.

The research has identified the key disability, construction, tourism, and government stakeholders and illustrated different modes of communication for each of these parties. The research outputs include presentations to disability and advocacy organisations, newsletters and Quick Fact Sheets for construction practitioners, discussions on tourism platforms, and a petition to the New Zealand government. Finally, the research has shown two important ways for universities to help achieve inclusive public buildings; firstly, by fostering increased interest in research related to accessibility and

secondly, by including Universal Design principles in the construction degree program to ensure that future building professionals have a greater understanding of the importance of inclusive buildings.

TABLE OF CONTENTS

1.0 INTRODUCTION

The 2023 Household Disability Survey shows that 17% of percent of New Zealand residents have a disability and that over one third of those people are adults aged 65 and older (Stats NZ, 2025). Legislation such as the United Nations Convention on the Rights of Persons with Disabilities (UNCRPD, 2006), building codes and standards should ensure that buildings are accessible to everyone. Although advances have been made, a review of the academic literature shows that accessibility in the built environment for disabled people is a significant problem both internationally (Jackson, 2018; Lund & Bringa, 2016; Vozikis, 2009) and within New Zealand (Berriman, 2023).

The problem of flawed accessibility in New Zealand was recognised ten years ago and was investigated as part of the MBIE-commissioned 'New Disability Strategy' (Malatest International, 2014; MBIE, 2015). The investigation found that some public buildings failed to comply with section 451, schedule two of the Building Act 2004 in providing access and facilities for disabled people and that anomalies between the New Zealand Building Code (MBIE, 2015) and New Zealand Standard NZS 4121:2001 (Standards New Zealand, 2001) contributed to confusion and cost-saving loopholes. The report led to the New Zealand government plan on improved accessibility (MSD, 2016) with a host of recommendations, from guidance to building owners to strengthened enforcement of compliance, all of which were to be achieved by 2018. The strategy is still not complete although NZS 4121:2001 is beginning to be updated.

The latest government effort is directed at passing the Accessibility for New Zealanders Act (ANZA), whose purpose "is to accelerate progress towards a fully accessible New Zealand". To achieve this goal ANZA proponents established an Accessibility Committee to identify accessibility barriers and work towards removing those barriers. The 27 sections of the Act are devoted to the committee's establishment, membership, powers, functions "and other matters". This is a great disappointment to those who experience disability (represented by the Access Alliance and Access Matters Aotearoa organisations) who were hoping for actual improvement, rather than the establishment of an advisory committee (Stefanitsis, et al., 2023). In early August 2023, Priyanca Radhakrishnan, the Minister for Disability Issues, announced the end to all progress on the bill prior to the election.

In summary, New Zealand's built environment remains inadequately accessible for disabled people and efforts to solve the problem have been slow and ineffectual. Key reasons for the failure are the lack of input from those who experience disability, ignorance of the range and scope of access difficulties by building practitioners, uncertainty on how to implement change, ambiguous/unenforced accessibility legislation, and a lack of agreement on who should fund the improvements to building accessibility features.

This research has addressed the need in five ways. Firstly, collaboration with key disability stakeholders (both people experiencing different types of disabilities and organisations advocating for them) has been used to determine the main accessibility challenges. Secondly, collaboration with construction stakeholders (such as

architects, construction managers, facilities managers, people working in buildings, and construction organisations) has been used to determine the main barriers to implementing inclusive access and the level of construction stakeholder knowledge of accessibility challenges. Thirdly, audits of different types of public buildings have provided metrics for the current level of accessibility. Fourthly, the business case for accessible tourism in New Zealand has been developed. Fifthly, practical steps to improve accessibility legislation have been used as the basis for a draft petition which will be submitted to the New Zealand government. Finally, the researchers have used a wide range of platforms (including webinars, conference presentations, journal articles, a 'Quick Fact Sheet' for construction practitioners and the introduction of Universal Design concepts into university courses for future construction professionals) to maximise the impact of the research findings.

2.0 RESEARCH OBJECTIVES AND OUTCOMES

The overarching aim of the research was to work collaboratively with stakeholders to determine practical ways to improve access to public buildings for New Zealanders who experience disability. The research objectives and anticipated outcomes were:

Objective One: To find the key accessibility challenges faced by users who experience disability in accessing New Zealand's public buildings. The anticipated outcomes were:

1. Analysis of an online survey of 100-300 disabled people to determine the main challenges in accessing public buildings and on the priorities for improvements, and
2. Identification of the types of building that are most difficult to access.

Objective Two: To see how current legislation and practice control the existing status quo of accessibility. The anticipated outcomes were:

1. Comparison between global and New Zealand accessibility legislation to assess areas/strategies for improvement.
2. Audits of three to five different types of public buildings (such as shops, libraries, and restaurants), with five to ten buildings in each type, to quantify the existing level of compliance with accessibility requirements. This would highlight accessibility features that are non-compliant and/or compromised by daily activities within the building.

Objective Three: To determine the level of awareness of inclusive building access among construction stakeholders (construction professionals and people working in buildings) and the main barriers to improving building accessibility. The anticipated outcomes were:

1. Interview 50-100 construction stakeholders to assess their understanding of the problem (i.e., the lived experience of disabled people), their knowledge of inclusive building access, and the barriers to improving accessibility.
2. Provide ways to help construction stakeholders become more aware of, and more empathetic to, the reality of the problems faced by users who experience disability when they try to access buildings.

Objective Four: To assess the potential economic benefit to New Zealand's tourism industry from increased access to public buildings for locals and international visitors. The anticipated outcome was to communicate this benefit to tourism-related audiences as well as highlight the business potential for owners of New Zealand's public buildings.

Objective Five: To recommend ways to improve the accessibility of New Zealand's public buildings through the three drivers of legislation, empathy and economics. The anticipated outcomes were:

1. Communication of the project outputs to the key disability, construction, tourism, and government stakeholders.
2. Fostering increased interest in research related to improving inclusive access in the built environment.

3.0 METHOD

This section outlines the method used to address each of the five objectives described in the previous section.

3.1 Research method to identify the challenges faced by users who experience disability (Objective One)

An Accessibility Partnership Panel (APP) was formed with seven members involved in the following disability organisations: Be.Lab, Blind Low Vision NZ, CCS Disability Action, Deaf Aotearoa, Independent Living Charitable Trust, Making Trax Foundation, New Zealand Spinal Trust, and People First NZ (Taranaki). The APP members, with their lived experience of disability, were actively involved in every stage of the research.

APP members provided preliminary information on the main challenges their clients face when accessing public buildings and on their priorities for long-term improvement. This information, together with a review of academic literature was used by the researchers and APP members to co-develop survey questions on the experiences of disabled people visiting New Zealand's public buildings. The research was approved by Massey University's Human Ethics Committee Ohu Matatika 1 (ID OM1 24/20, date of approval: 17/7/2024, valid for a period of 3 years). The survey was activated from 30/9/2024 to 30/11/2024 and administered using Qualtrics software for the online survey, together with hard copy and phone survey options. The researchers and APP members announced the survey via social media such as Facebook and LinkedIn.

The number of disabled people in New Zealand in 2023 is 17% or 851,000 people (Stats NZ, 2025). The target number of survey respondents was estimated at 217 using statistical power analysis for a confidence level of 95% that the real value is within +/- 5% of the measured/surveyed value (Calculator.net). The target number was exceeded; 319 valid survey responses were collected. 33 responses were incomplete, but the answered portions are included in the analysis.

3.2 Research method to examine the status quo of accessibility legislation and construction stakeholder practice (Objective Two)

A literature review was used to assess the limitations of New Zealand building accessibility legislation compared with similar legislation in other countries. This was used to make recommendations for improving New Zealand's legislation.

The accessibility of a range of public buildings in New Zealand was assessed for compliance with the country's standard (NZS4121: 2001 Accessibility and Mobility Design) using three case studies comprising ten shops, ten libraries and eleven restaurants. In addition, a small sample of people working in the buildings was asked about their experience in dealing with disabled people.

3.3 Research method to determine the level of awareness of inclusive building access among construction stakeholders (Objective Three)

An online questionnaire provided data from 61 building professionals involved in the design and management of public buildings in New Zealand (Table 1). The questionnaire assessed the respondent's knowledge of inclusive building access in the context of New Zealand legislation and policy, international legislation, application of inclusive access, perception of the state of accessibility in New Zealand public buildings and awareness and training in the area.

Table 1. Demographics of the respondents (61 building professionals)

Characteristic	Demographic
Primary job role	Quantity Surveyors (31%); Site Managers/Engineers (25%); Project Managers (23%); Architects (15%); Commercial Managers (3%); Other (3%)
Experience (years)	Over 15 (41%); 11 to 15 (31%); 6 to 10 (21%); 1 to 5 (5%); less than 1 (2%)
Primary project type	Buildings (80%); Infrastructure (15%); Services (2%); Other (3%)

The researchers developed a range of outputs to help construction stakeholders become more aware of, and more empathetic to, the reality of the problems faced by users who experience disability when they try to access buildings. These included:

- A news article and Quick Fact Sheet for construction practitioners.
- A research article illustrating the role of the university in helping the construction community improve inclusive access to buildings.

3.4 Research Method to assess the potential economic benefit to New Zealand's tourism industry (Objective Four)

The researchers assessed the economic benefits of inclusive access to tourism-related buildings for the New Zealand tourism industry from increased access to public buildings for locals and international visitors.

The anticipated outcome was to communicate this benefit to tourism-related audiences and raise the awareness of the business potential for owners of New Zealand's public buildings.

3.5 Research method for determining ways to improve the accessibility of New Zealand's public buildings through the three drivers of legislation, empathy and economics (Objective Five)

The researchers developed ways to communicate the project outputs to the key disability, construction, tourism, and government stakeholders. The research fostered considerable interest amongst both academic staff and students seeking professional construction qualifications.

4 RESULTS AND DISCUSSION

This section outlines the results that were achieved in addressing each of the five research objectives.

4.1 Identification of the challenges faced by users who experience disability (Objective One)

4.1.1 Type of impairment of the respondents (N=319)

Figure 1 shows the types of impairment reported by the 319 respondents. The most common types of impairment are mobility (two thirds of the respondents) and vision (18% of respondents). 7% of the respondents reported a variety of impairments such as sensory processing disorder (SPD), auditory processing disorder (APD), autism, dyslexia, schizophrenia, depression, anxiety, and trauma which were loosely categorised as "cognitive" impairment.

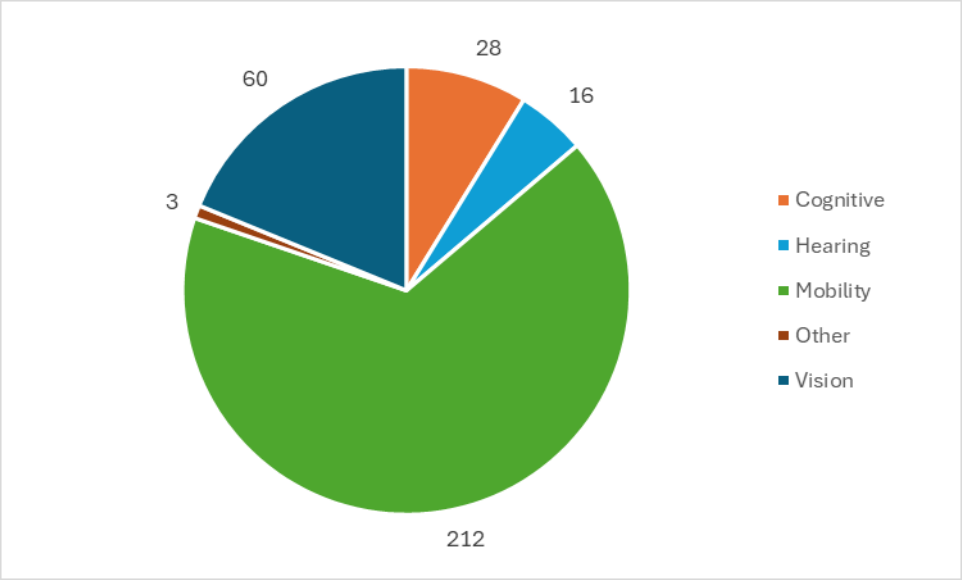

Figure 1. Type of impairment of respondents (N=319)

4.1.2 Accessibility of different types of buildings and spaces

Figure 2 shows the average level of difficulty experienced by the respondents in accessing different types of public buildings, ranked from the most difficult building type (sports stadium) to the easiest type (supermarket). The level of difficulty was expressed as a 5-point Likert scale where 5 is Very Hard; 4 is Hard; 3 is Ok; 2 is Easy and 1 is Very Easy. Respondents could choose an additional option: "I do not go there", in which case their response was not included in the average difficulty rating for that particular building type. The average scores range from 3.39 to 2.56 and the number of respondents who ranked the different building types ranged from 313 respondents (98%) to 161 respondents (51%).

The ten hardest places to visit in order from most difficult are: sports stadium, bar, boutique shop, public toilet, marae, gym, motel/hotel, dairy/small corner shop, bus stop, theatre/cinema. The ten easiest places to visit in order from easiest are: supermarket, library, mall, doctor's office, pharmacy, bank, museum/art gallery, hairdresser, hospital, community centre.

Figure 3 shows the percentage of respondents who visit each type of building, ranked from the most commonly visited building type to the least commonly visited type. Over 90% of all respondents visit a doctor's office, pharmacy, supermarket, restaurant, park/public garden, hospital, boutique shop, shopping mall, public toilet and dentist. Only half of the respondents visit a gym, and churches and maraes are also visited infrequently (by slightly more than 50% of the respondents). The cause for this is unknown; it may arise from personal choice and is not necessarily an indication that the respondents do not go to that particular building type because it is hard to access/use.

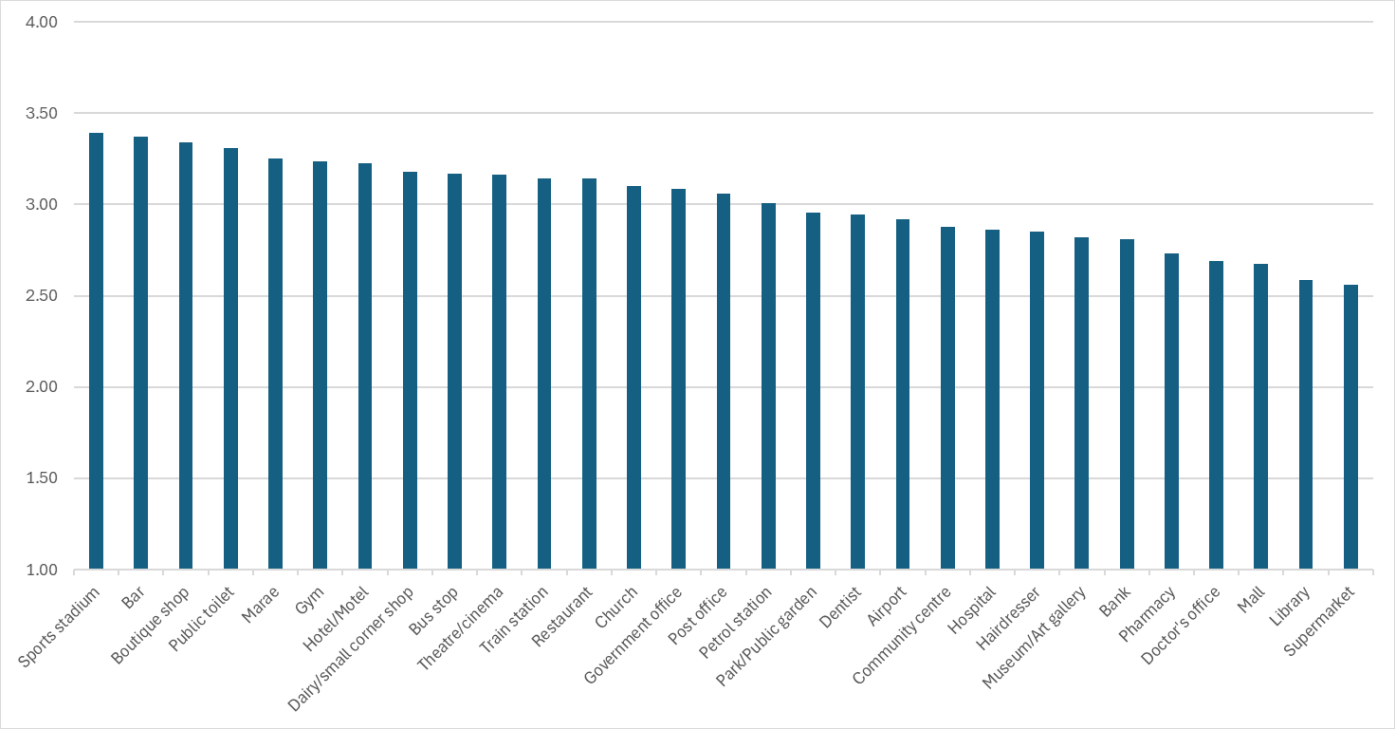

Figure 2. Average access difficulty by building type reported by respondents (N=319)

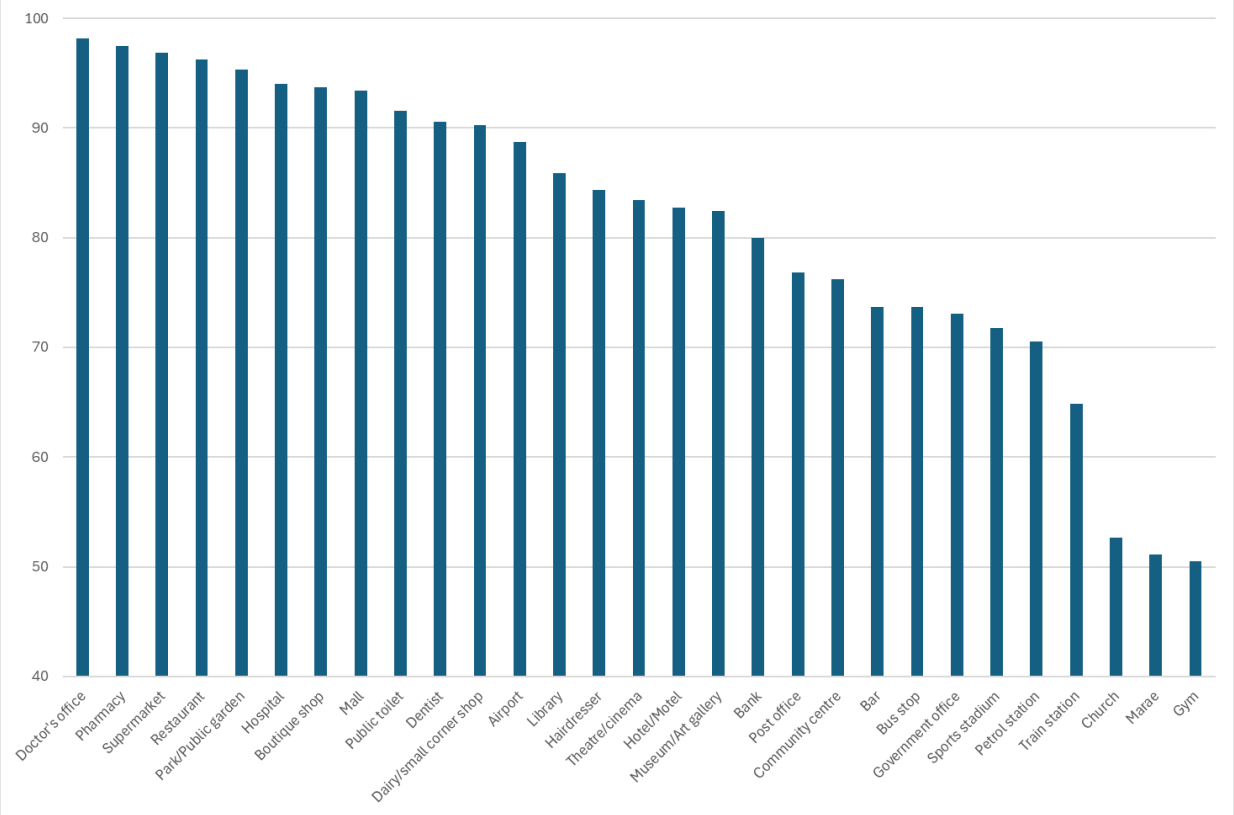

Figure 3. Percentage of respondents (N=319) visiting different building types

4.2 Mobility impairment findings

Mobility impairment varies widely, and respondents reported using a variety of assistive devices including wheelchairs (both powered and manual), walkers and canes.

The survey examined the main challenges outside buildings, at the main entrance to buildings, and inside buildings. A final question asked respondents to state the one thing they would like to see improved in accessing public buildings. The questions in this section of the survey were “open-ended”; respondents answered in their own words. Common themes were then extracted from the responses. In this preliminary analysis, the responses from 56 of the 212 respondents who have a mobility impairment are reported. Note that some respondents gave more than one answer to each of these aspects, so the number of responses (N) varies.

4.2.1 Access challenges outside public buildings for people who have a mobility impairment

The most commonly reported challenge of accessing the outside of public buildings (Table 2) comes from outdoor paths that are uneven, have a rough surface or are poorly maintained.

The results show the importance of the following: keeping paths smooth, level, clear of obstacles (including cars), wide enough, as short as possible, well-marked and provided with kerb cuts; providing clearly marked steps and ramps close to the entrance to buildings; ensuring ramps are not too steep; having adequate accessible parking placed near the building, on level ground and with sufficient clearance.

Table 2. Main challenges outside public buildings for people who have a mobility impairment

Feature	N	%	Description of challenge
Kerb cut	9	10.5	Missing.
Paths	22	25.6	Uneven, cracked, rough, bumpy, poorly maintained, potholes, gravel.
Obstacles on path	9	10.5	Bollards, trolleys, scooters, cars parked over footpath, recycling bins on footpaths, gutters, planters, people.
Steps	6	7.0	No handrail (especially necessary when wet), no markings.
Ramps	6	7.0	Too steep, missing, placed at rear of building or not obvious, access to ramp blocked.
Accessible parking	12	14.0	Missing/too few, inadequate van/lift clearance (particularly in covered parking), too far away, on a slope.
Other	22	25.6	Narrow path, table clearance, no pedestrian crossing, finding the wheelchair accessible entrance (why are these not located by the disability parking areas?), no anti-slip surface, dim lighting, poor signage, poor contrast (on foot path/car route), no seating, danger from being on car route, access path not clear, long distances (eg. from bus stop), lack of ramps means we have to travel with our own (power wheelchair user).
Total	86	100	

4.2.2 Access challenges at the entrance to public buildings for people who have a mobility impairment

The main challenges (for people with mobility impairments) at the entrance to public buildings arise from the type of door, obstacles within the entrance path, the width of the door, and the door access control (Table 3).

Doors should be automatic or easy to open, and free of threshold lips, steps and other obstacles. Entrances should be wide enough to accommodate wheelchairs, close to ramps and clearly labelled.

Table 3. Main challenges at the entrance to public buildings for people who have a mobility impairment

Feature	N	%	Description of challenge
Access control	12	14.3	Manual door is difficult/hard to push, hard to locate/grip the handle (eg. when using a walking stick), complex controls, opening in/out is hard to determine.
Door type	24	28.6	Too heavy/requires too much effort to push or pull (especially fire doors), transparent doors and unmarked/frosted marking (with poor contrast) are hard to see, double doors where one is locked and it is not obvious which door to use, revolving doors are a barrier and health/safety risk – wheelchairs can get jammed in there.
Width	15	17.9	Too narrow.
Obstacles	17	20.2	Steps or objects in front of entrance, threshold/lip is too high, uneven surface, mats in entrance, plants in the way of handrails.
Finding entrance	5	6.0	Poor/no sign to show where the entrance to the door is.
Other	11	13.1	Automatic doors close too quickly, ramps located far from entrance door, swinging doors close too quickly, entrance is blocked, entrance is incorrectly labelled as wheelchair accessible.
Total	84	100	

4.2.3 Access challenges inside public buildings for people who have a mobility impairment

Inside the building, the most common challenge (Table 4) is from narrow aisles and obstacles (such as stock displays, people and general clutter) in the path. Many respondents reported difficulty finding the way through building interiors. In the “Other” challenge category, it is apparent that respondents may be dealing with other types of impairments (besides mobility), such as sensory-related or stroke-related.

Respondents would prefer wide, unobstructed paths and clear information/direction signage in the building. They need space to maneuver around shop displays and require access to stock (on shelves and in refrigerated units) from wheelchair level. Lifts should be easy to find and use and stairs should be clearly marked and not too steep.

Table 4. Main challenges inside public buildings for people who have a mobility impairment

Feature	N	%	Description of challenge
Aisles	21	23.3	Too narrow.
Obstacles in paths	15	16.7	Furniture, wide displays that are hard to get around, stock displays, clutter, people, steps, uneven surface, thick carpets, doors.
Shelves or counters	7	7.8	Too high to see/reach from eye level in a wheelchair, glass doors over the top of refrigerator cabinets cannot be reached from a wheelchair.
Lifts, elevators, stairs	8	8.9	Lift not working, no lift, no space in a lift, swipe card entry to lift (so a staffer has to swipe me into the lift), direction to lift not clear, escalators are hard to use, poor contrast markings/no tactile indicators on stairs, steep stairs.
Restrooms	3	3.3	No accessible restrooms, no adult sized change tables or hoists, restroom entrance doors are problematic.
Wayfinding	15	16.7	No signposts, no instructions, small font on notices, internal structure of the building is complex, the corridors are staggered.
Other	21	23.3	Bright lighting, too noisy, sensory overload (eg. in big open spaces, with solid surfaces that reflect noise), slippery/highly polished floors, no seating, lack of space for wheelchair users in waiting rooms, long distances, no protection bars near breakable displays, furniture design (eg. clearance under desk), emergency exit routes that are inaccessible for wheelchairs, heavy fireproof doors, internal doors that are difficult to open and hold while getting the wheelchair through, rude people, queues on one side (the stroke-affected side so arm movement and sight/hearing from that side are difficult), deaf and cannot follow the verbal instructions of staffers.
Total	90	100	

4.2.4 Priorities for change to accessibility for people who have a mobility impairment

The respondents with mobility impairments want to have better internal doors, i.e., doors that are easy to open, marked with the direction of opening, wide enough, free from lips/steps, and with a level area on either side. The respondents also want good signage, wide, clear paths and ramps that are close to the building entrance and not too steep. Well-differentiated stairs with handrails, functional accessible restrooms (for all ages), and provision of seating are other requirements.

From the responses (Table 5), it is apparent that many people have other impairments (such as vision and sensory-related ones) in addition to mobility impairments. The comments reveal a sense of frustration with the status quo and the feeling that accessibility needs to be prioritised, improved and legislated.

Table 5. Top priorities to improve accessibility for people who have a mobility impairment

Feature	N	%	Description of priority for change
Aisles, paths	5	9.4	Clear and uncluttered, even walking surface, no steep slopes, repair/maintain pathways, wider aisles.
Doors	20	37.7	Large push or pull signs, easy open doors (wider, automatically opening doors on a long timer), a flat area at swing doorways (so not rolling backward when opening it), fire doors with press button control, high contrast entrance and exit doors, no lip at entrances (it's a trip hazard), doors that can be pushed open without having to grip a handle.
Ramps	5	9.4	Provide a wheelchair ramp with handrail beside stairs and near the entrance, no steep ramps.
Stairs	2	3.8	Use markers or contrast on stairs, add handrails to stairs.
Accessible restrooms	2	3.8	Have changing places for adults, enough space, clean and not broken toilet.
Wayfinding	4	7.5	Bright lighting and contrasting colors/textured surfaces to improve visibility, signposting/instructions about opening hours, clear/obvious wayfinding paths, clear and touchable Braille sign at the entrance of the building to inform the blind about the basic layout of the building.
Signs	6	11.3	Bigger font on any printed messages, voice prompts, provide audio/magnification and zooming/colour contrast signs for people with low vision, more braille (not just in lifts), give clear information about what to expect.
Sensory	2	3.8	Dim the lighting, turn off the background music.
Seating	3	5.7	Provide more seating.
Other	4	7.5	Stop treating accessibility as an afterthought, adopt universal design principles in all buildings, prioritize people's safety over cars, use consultation with the disabled community, make access a law for all buildings used by the public (give building owners two years to fix problems, just like landlords and the Healthy Homes standards).
Total	53	100	

4.3 Vision impairment findings

The survey examined the main challenges outside the building, at the main entrance to the building, and inside the building for people who have a vision impairment (blind people or those with low vision). A final question asked respondents to state the one thing they would like to see improved in accessing public buildings. The questions in this section of the survey were "open-ended"; respondents answered in their own words. Common themes were then extracted from the responses. The responses from all 60 respondents who have a vision impairment are reported. Note that some respondents gave more than one answer to each of these aspects, so the number of responses (N) varies.

4.3.1 Access challenges outside public buildings for people who have a vision impairment

Table 6 summarises the main challenges outside public buildings for those who have a vision impairment.

Table 6. Main challenges outside public buildings for people who have a vision impairment

Feature	N	%	Description of challenge
Wayfinding	24	32.0	Finding: the main entrance, correct door, a safe route (particularly through confusing alternative pathways, or amongst cars), the correct building itself, steps, ramp, lift, reception, correct floor.
Obstacles in path	26	34.7	People, traffic, uneven paths, potholes, unmarked steps (particularly without a handrail), kerbs, signs/displays in front of shops, animals, tables, construction zones, bridges.
Signage	8	10.7	Absence of large signage indicating the entrance (not just at the door but also at the footpath showing the direction to the door), unclear/small signs (for directions, parking restrictions, and safety warnings), signs with poor contrast, Braille and audio cues are hardly ever used and sometimes out of reach.
Other	17	22.7	Doors (particularly glass ones) that blend in with the building façade, safety concerns (eg. walking through carparks that do not have footpaths or pedestrian crossing), poor colour contrast, assessing the location and speed of vehicles on parking lots or roads, inadequate lighting, limited/no affordable public transport preventing inclusion in some places, seeing traffic lights (making it challenging to cross streets safely), being unable to safely access and navigate public transportation systems, such as buses or trains, weather (such as rain or snow) that obscures obstacles and make surfaces slippery, poor screen readability, limited tactile markings, feeling judged by people, getting someone's attention, social isolation.
Total	75	100	

The greatest challenge outdoors is obstacles in the path, either from the condition of the path itself (having a rough surface and being poorly differentiated) or from people, cars, signs, display stands and other objects. Wayfinding and signage are other major challenges. Respondents report being unable to identify the main entrance, correct door, steps, ramps, lifts, reception areas, etc. because signage is missing or inadequate (with small text) and because there is low colour contrast (e.g., doors blend in with walls). The addition of better signage (including Braille and audio signs), bright lighting, tactile marking and good colour contrast would improve this challenge. Safety is a priority, and the outdoor environment should be designed in a way that keeps people safe from traffic and other obstacles. Finally, people who have a vision impairment report feeling self-conscious and isolated as they interact with other people.

4.3.2 Access challenges at the entrance to public buildings for people who have a vision impairment

At the entrance to buildings (Table 7), respondents find it challenging to know how the door opens; whether it is manual or automatic, which way it opens, where the handle is, how the security lock operates, etc. The problem is exacerbated when the entrance has a sophisticated visual-based security feature (such as phone or pin code access) and no instructions or personnel to assist those with vision impairments. Identifying the entrance itself is also difficult, particularly when it is identical in appearance to the façade of the building and

has no identifying signage. Other challenges are heavy doors, revolving doors, obstacles (such as lips/steps, plants, people, canopies) in the entrance, narrow entrances, and dim lighting.

Table 7. Main challenges at the entrance to public buildings for people who have a vision impairment

Feature	N	%	Description of challenge
Access control	23	29.5	Challenges in understanding how to open the door, whether manual or automatic or fitted with a child lock or security feature (eg. requiring a key card, pin code or phone to access), knowing whether sliding glass door is open and which way it slides, difficulty locating door handles, unclear direction of opening, sudden and loud alarms triggered by automatic doors can be startling and disorienting.
Door type	13	16.7	Heavy doors are hard to open (particularly when using a guide dog or walker), revolving doors are extremely difficult, glass doors without a visual guide that allows you to know it is glass, doors with no contrast from surroundings. (Automatic doors are generally good).
Width	2	2.6	Doors too narrow for the number of people (especially with 2-way traffic), doors not wide enough for myself and my guide dog to use.
Obstacles	13	16.7	Steps at the entrance (particularly unmarked and without handrail), entrance lip, people, objects (plants, benches, or debris) placed near the door, navigating through weather barriers like vestibules, awnings, or canopies that obscure the doorway.
Finding entrance	17	21.8	Identifying the entrance particularly when the frontage is all glass, often doors and windows look similar, unmarked doors/doors without signs, cafe or restaurant doors aren't obvious.
Other	10	12.8	Difficulty adjusting to light change at the entrance, dim lighting at the entrance can obscure obstacles and make it hard to see signage, getting assistance, signs and directions near the entrance that are hard to read/have small text, inadequate tactile marking and braille, slippery entrance surface.
Total	78	100	

4.3.3 Access challenges inside public buildings for people who have a vision impairment

Inside the building, the main challenges (Table 8) relate to complex wayfinding, poor signage and obstacles in the paths. Paths should be wide enough to accommodate a guide dog, well-differentiated, and have tactile marking (particularly in large open spaces). Flooring should not be patterned, shiny or wet. Signage should be both visual (with large text) and non-visual (braille or sound-based) and should provide adequate information to allow non-visual navigation to places such as the lifts, restroom and service areas. Paths should be kept clear of furniture, displays, steps, and general objects.

Table 8. Main challenges inside public buildings for people who have a vision impairment

Feature	N	%	Description of challenge
Paths	10	11.4	No/unmarked walkways, large open spaces with nothing to follow, shiny or patterned floors make it difficult to see, wet/polished floors are a slip hazard, narrow paths (with people moving in different directions, or through restaurant tables), uneven floors, moving walkways.
Obstacles in paths	12	13.6	People, steps (particularly unmarked), escalators, chairs, tables, doors, debris, construction materials.
Poor signage	13	14.8	Inadequate signs and information (too small, poor contrast), electronic signs in terminals, black tape barriers at airports (they should use yellow tape), safety signage can be hard to see. Audible/tactile signage would be useful.
Lifts/elevators/stairs	8	9.1	Lifts that are not blind-friendly (lacking braille, using electronic floor information instead of verbal messages), out of service or malfunctioning.
Restrooms	3	3.4	Dim lighting, hard to find.
Wayfinding, locating things	27	30.7	Few navigation cues or directions, reception desk not always obvious or well signposted, identifying the position of counters and queue lines, finding key features (the lifts, accessible restrooms, stairs), finding objects in shops, no receptionist/person to assist and only visual information.
Other	15	17.0	Lack of reception/staff to assist, finding places to rest or sit (especially in large or busy areas), change of light level, dim lighting (too dim), poor acoustics (loud noise or echoes), sensory overload, poor air quality (from smoking or chemicals), being denied access due to having a guide dog. Things that would help: providing volunteers, audio cues and using a typical layout that can be relied on.
Total	88	100	

Personnel trained to understand and assist people who have a visual impairment, seating areas, good acoustics (low background noise and no echoes) and good lighting would improve the experience inside public buildings.

4.3.4 Priorities for change to accessibility for people who have a vision impairment

Table 9 lists the top priorities for change for respondents who have a vision impairment.

Safety, predictability and reliability are important to people with visual impairments in accessing public buildings. Paths should follow simple layouts, keep people safe from cars and other obstacles and should use tactile marking. Uniform, well-differentiated steps with continuous handrails and lifts with braille or audible messages are essential. Key parts of buildings should be clearly marked, with good colour contrast. Instructions and directions should be given in large text and braille, supplemented with audible cues. Where possible (for example, in restrooms) the layout should be standardised. Low background noise, good lighting (adequately bright but without glare), and matte flooring are needed.

Table 9. Top priorities to improve accessibility for people who have a vision impairment

Feature	N	%	Description of priority for change
Safety issues	5	10.6	Reduce exposure to hazards (such as traffic, sharp corners, hard surfaces, heavy/hard door closing), clear paths without obstacles (eg. shop items), well-differentiated steps (with good colour contrast), standardised emergency protocols.
Doors/entrance	6	12.8	High visibility handle on the door, good contrast with background and clearly labelled eg. with the shop name, glass doors with blind-friendly markings/signs, automated doors where possible, ramp or accessible entrance not tucked away down the side of a building with no/only a small sign indicating where they are, separate entrance just for the disabled.
Assistance	5	10.6	Access and guidance to counters or offices for service should be predictable and discernible, having a tactile ridge in the middle of large spaces so that blind people can navigate without bumping into things, having a short audio cue at the building entrance that directs you to human help and/or directions to main areas such as a concert venue or toilets, trained staffs should be available to help when needed, use of assistive technologies like audio descriptions.
Ramps/stairs/lifts	3	6.4	Avoid steps with varying height and tread depth, handrails on stairs (especially when there is a change in direction of the steps), handrails that extend up to or slightly beyond the last step (it is disconcerting to find there is either one step remaining, or one step fewer), predictable handrails (the rail should reliably "come to hand"), having lifts with verbal messages, having ramps.
Restrooms	3	6.4	With a standardised layout (position of items, height of rails and dispensers, method of securing doors), providing more accessible toilets and a way to keep non-disabled out of them (in the UK there is a universal key that disabled people can have for accessible toilets).
Wayfinding	15	31.9	Standardised layout requirements (eg. very visible entrance, no steps near doors, identification signs on doors), simple navigation paths, audible or tactile navigation cues, non-shiny flooring (matte finish would be better), more detailed layout maps.
Signs	8	17.0	High contrast access instructions of a size that all can see and read, tactile and braille signage
Other	2	4.3	Consider safety, predictability and reliability, signs at entrances (Google Maps isn't accurate enough to get me to the entrance).
Total	47	100	

4.4 Hearing impairment findings

16 respondents reported having a hearing impairment (Deaf or hard of hearing), and of these, two reported other conditions as well, related to brain injury, trauma, etc. There were not enough responses in this impairment category for a thematic analysis of the responses, but the main findings are given below.

4.4.1 Access challenges outside public buildings for people who have a hearing impairment

The main challenges include finding the building entrance and facing obstacles (such as people, traffic, steps, kerbs, and gutters). Respondents reported difficulty getting assistance from people (being unable to hear the response), lack of facilities or services for deaf people (particularly in cultural/entertainment, education and sports environments), suffering anxiety from not being able to hear ambient sounds and experiencing low self-esteem, anxiety or depression.

4.4.2 Access challenges at the entrance to public buildings for people who have a hearing impairment

The main challenge is the trend of buildings to have locked doors with voice message/instructions on how to enter and with no accommodation for Deaf people (personnel trained to assist or clear signage on where/how they can get help). Other challenges include no soundproofing (so the entrance sound level is a problem), narrow entrances, heavy doors, uneven entrance floor surface and entrances exposed to weather (becoming wet/slippery). Respondents reported feeling unsafe.

4.4.3 Access challenges inside public buildings for people who have a hearing impairment

The main challenges inside public buildings include obstacles in the path (e.g. from merchandise, signs, people, furniture, and equipment); intrusive noises (from machines and construction), being unable to hear spoken announcements, and finding out information in the building/knowing where to go without being able to hear people. Respondents reported feeling stressed and anxious.

4.4.4 Priorities for change to accessibility for people who have a hearing impairment

The top priorities for people who have a hearing impairment include use of visual/electronic displays of messages, having the price marked on items (since they cannot hear a person's response), having more accessible restrooms and proper provision of assistance for Deaf people.

4.5 "Cognitive" impairment findings

As mentioned in the introduction, the term "cognitive' is used loosely and covers a very wide range of different impairments, including learning, neurological, neurodevelopmental conditions, some of which vary over time.

The survey examined the main challenges outside the building, at the main entrance to the building, and inside the building. A final question asked respondents to state the one thing they would like to see improved in accessing public buildings. The questions in this section of the survey were "open-ended"; respondents answered in their own words. Common themes were then extracted from the responses. 28 people identifying

with a “cognitive” impairment completed the survey but 3 of them provided no information in the open-ended questions. The responses from the remaining 25 respondents are reported. Note that some respondents gave more than one answer to each of these aspects, so the number of responses (N) varies.

4.5.1 Access challenges outside public buildings for people who have a cognitive impairment

In common with the respondents with other types of impairments, the respondents in this cohort were primarily challenged by wayfinding and obstacles outside the building (Table 10).

Table 10. Main challenges outside public buildings for people who have a cognitive impairment

Feature	N	%	Description of challenge
Wayfinding	10	32.3	Finding the entrance, no clearly designated paths.
Obstacles in path	9	29.0	People, slopes, steps (particularly when wet), uneven paths, rough paths (eg. cobblestones), narrow paths, noise.
Signage	3	9.7	Unclear signage that is hard to understand.
Other	9	29.0	No/little accessible parking, few bike racks with secure locking, long distance from parking to building, stress around parking/transport to the place, dealing with unfamiliar places (particularly in built-up areas), anxiety about safety concerns, poor weather.
Total	31	100	

The respondents reported high levels of stress and anxiety about the environment.

4.5.2 Access challenges at the entrance to public buildings for people who have a cognitive impairment

Table 11 shows the main challenges at the entrance to public buildings for people who have a cognitive impairment. Chief amongst these challenges is the door type (e.g., heavy doors, revolving doors, complex latches or locks) coupled with anxiety around gaining access (waiting for admittance) and engaging with door handles or buttons. Other challenges are unmarked/hard to find entrances and obstacles in the entrance.

Table 11. Main challenges at the entrance to public buildings for people who have a cognitive impairment

Feature	N	%	Description of challenge
Access and door type	11	42.3	Revolving doors, waiting to be buzzed in at the mobility entrance, hate touching things such as door handles or buttons, complex/stiff door locks/latches, heavy doors, direction of door opening, narrow doors.
Obstacles in entrance	3	11.5	People moving in both directions, stairs, slippery entrance surface.
Finding the entrance	7	26.9	Entrances that are unmarked or hard to find.
Other	5	19.2	Social anxiety, anxiety waiting for assistance, loud noise, bright lights.
Total	26	100	

4.5.3 Access challenges inside public buildings for people who have a cognitive impairment

Inside buildings the main challenges are from wayfinding/poor signage and dealing with obstacles in the path (Table 12).

Table 12. Main challenges inside public buildings for people who have a cognitive impairment

Feature	N	%	Description of challenge
Paths	4	10.3	Too narrow, slippery, long corridors.
Obstacles in paths	10	25.6	Noise, lights, lots of people, bright colours, close spaces, queues, strong smells, doors, dogs present.
Poor signage	5	12.8	Hard to understand.
Lifts, elevators, stairs	2	5.1	Dependent on lifts and hate the beeping, not enough handrails and stairs are not wide enough.
Restrooms	1	2.6	Not available.
Wayfinding	10	25.6	Hard to find the way, hard to find things.
Other	7	17.9	No seating, social fatigue and anxiety, lighting (flickering, noisy or humming), sensory overload makes navigation hard, being observed, asking people for directions because of a speech impairment.
Total	90	100	

Some obstacles, such as people and doors, are challenges to people with other types of impairment but this cohort is also troubled by sensory-related obstacles including bright colours, loud noise, poor lighting, close spaces, and smells. The respondents noted that sensory overload hindered their use of the building. Anxiety, social fatigue and self-consciousness are common in these respondents.

4.5.4 Priorities for change to accessibility for people who have a cognitive impairment

Table 13 lists the features in public buildings that people who have a cognitive impairment would like to see changed. Clear, simple layouts and unambiguous signs in English or universal picture format are preferred. Sensory aspects such as loud noise, poor lighting (flickering, strobing, high glare) and bright colour are challenges that could be managed by removing/reducing them in the building at certain times on some days or by providing a separate quiet space where people can sit and recover from sensory overload. Several other requirements, such as non-slip floors, automatic doors, provision of ramps/lifts, and seating would benefit both this cohort of respondents as well as people with other types of impairment.

Table 13. Top priorities to improve accessibility for people who have a cognitive impairment

Feature	N	%	Description of priority for change
Safety issues	2	6.3	Avoid mats outside and inside, have non-slip floors.
Doors	4	12.5	Use quiet, automatic doors or single direction doors that push in the direction of travel.
Ramps/stairs/lifts	1	3.1	Have proper ramps and/or elevators.
Wayfinding and signage	14	43.8	Use a simple, unobstructed, consistent layout with clear signs/directions, clearly marked doors, signs should be in English or universal pictures, signs should be consistent, signs should follow regulations.
Sensory	6	18.8	Introduce legislation to reduce internal noise level including music (some supermarkets voluntarily do this during certain times on some days), dimmer lighting, no fluorescent lighting or harsh/unshielded LEDs, no flickering or strobing lights, warmer lighting colour, more sensory friendly environments (eg. quiet spaces with dim lighting and muted colours).
Seating	1	3.1	Provide indoor seating to allow people to rest.
Other	4	12.5	Have people trained to understand the needs of people with cognitive/sensory impairment, provide more secure bike racks, show information about the place so that people can prepare (eg. bring ear protection).
Total	32	100	

4.6 The status quo of accessibility legislation and construction stakeholder practice (Objective Two)

A comparison was made between global and New Zealand accessibility legislation to assess areas/strategies for improvement. The results have been published in Stefanitsis et al. (2024) and were presented at the 8th New Zealand Built Environment Research Symposium (NZBERS) in 2025 (Appendix A).

The accessibility of a range of public buildings in New Zealand was assessed for compliance with the country's standard (NZS4121: 2001 Accessibility and Mobility Design) using three case studies comprising ten shops, ten libraries and eleven restaurants. In addition, a small sample of people working in the buildings was asked about their experience in dealing with disabled people. The results have been published in Flemmer and McIntosh, 2025.

4.7 The awareness of inclusive building access among construction stakeholders (Objective Three)

Data on the awareness of 61 building professionals involved in the design and management of public buildings in New Zealand is published in Flemmer and McIntosh, 2025.

The researchers developed a range of outputs to help construction stakeholders become more aware of, and more empathetic to, the reality of the problems faced by users who experiemce disability when they try to access buildings. These include:

- A news article for the New Zealand Institute of Builders (NZIOB) which is available at https://nziob.org.nz/news-2/access-to-new-zealands-public-buildings-for-people-with-disability/
- A Quick Fact Sheet for construction practitioners (Appendix B). This document has a set of simple steps to make buildings more accessible. It also explains how disabled people would like to be treated.

4.8 The potential economic benefit to New Zealand's tourism industry (Objective Four)

The researchers developed the business case for making New Zealand's public buildings more accessible and inclusive and this was presented by Alison McIntosh at the Seventh International Conference on Universal Design in Oslo (Norway), in November 2024 (McIntosh, et al., 2024). It will also be presented at the Critical Tourism Studies X conference in Palma de Majorca, Spain, (June 29 to July 3, 2025) and the draft conference article is included in Appendix C.

4.9 Ways to improve the accessibility of New Zealand's public buildings through the three drivers of legislation, empathy and economics (Objective Five)

The researchers developed several different modes of communication to the key disability, construction, tourism, and government stakeholders to increase the impact of the project outputs (Table 14).

Table 14. Communication of research outputs to key stakeholders

Description of output	Stakeholders
Presentation to the 'Kōrero for Change - Housing and the Built Environment' webinar, organised by Access Matters Aotearoa Trust. The recording is available here: https://www.accessmatters.org.nz/housing_and_the_built_environment from time = 1:04 to 1:35.	Disability, construction, government.
Draft petition on changing New Zealand legislation to provide more inclusive Built Environments. The petition is available here: https://www.change.org/p/enact-robust-legislation-for-accessible-housing-and-built-environments	Disability, government.
Presentation to the UD 2024 conference in Oslo, Norway, available at: https://webcast.massey.ac.nz/Mediasite/Play/008b1e07af3547a4ae27d8004850e5391d	Disability, tourism, academic.
News article for NZIOB available at: https://nziob.org.nz/news-2/access-to-new-zealands-public-buildings-for-people-with-disability/	Construction.
Quick Fact Sheet (Appendix B)	Construction.
Journal articles: Flemmer and McIntosh, 2024; Glass and Flemmer, 2024	Academic.

To foster increased interest in this research area, the researchers developed guidelines illustrating the role of the university in helping the construction community improve inclusive access to buildings. An article (Appendix D) has been accepted for the CIB World Building Congress in Indiana, USA, in May 2025 (Flemmer et al., 2025).

5 CONCLUSIONS

5.1 Review of the research findings

The first objective of this research was to find the key accessibility challenges faced by users who experience disability in accessing New Zealand's public buildings and to identify the types of building that are most difficult to access. A survey of 319 New Zealand residents who experience disability showed that the ten least accessible building types are, in order of difficulty, sports stadiums, bars, boutique shops, public toilets, maraes, gyms, motels/hotels, dairies/small corner shops, bus stops, and theatres/cinemas. The top priorities for improving access depend on the type of disability of the respondents:

- People with mobility impairments require doors that are easy to open, clear signage, uncluttered paths and ramps that are not too steep and positioned near the building entrance.
- People with vision impairments (blind or low vision) require better wayfinding features (simple navigation paths with audible or tactile navigation cues), better signage (large text with good colour contrast and braille) and high visibility doors.
- People with hearing impairment (Deaf or hard of hearing) require visual/electronic displays of messages and proper provision of assistance for deaf people.
- People with learning, neurological, neurodevelopmental conditions ("cognitive" impairments) require better wayfinding features (simple navigation paths and clear signs), and control of the sensory environment, for example, with less noise, better lighting (with less glare, no flashing lights, and warmer colours).

The second objective was to recommend improvements to New Zealand's accessibility legislation and to quantify the accessibility of different types of public buildings using audits of case study buildings. Ten shops, ten libraries, and eleven restaurants were assessed for their compliance with NZS4121:2001. Larger shops were found to be more accessible than smaller shops; having better accessibility features, trained staff and allocated 'quiet times' with sensory control. Libraries were found to have good accessibility. Restaurants were moderately accessible for people with mobility impairments but failed to address the needs of people with other types of impairments. New Zealand's accessibility legislation is both outdated and vague, with many loopholes, and minimal enforcement. Legislators are aware that improvements are needed but do not know what the priorities are or what steps to take. The researchers used their findings to draft a petition, in collaboration with

Access Matters Aotearoa, addressing these aspects and this will be presented to the New Zealand government in 2025.

The third objective was to determine the level of awareness of inclusive building access among construction stakeholders (construction professionals and people working in buildings) and their main barriers to improving building accessibility. A survey of 61 construction professionals, showed them to have little knowledge of the topic and to be reluctant to bear the financial cost of improving building accessibility. The perception of people working in buildings was similar; they were unaware of the accessibility challenges for disabled people and passive about changing the status quo if they had to pay for the provision of better access. Construction stakeholders need to be educated and assured that they are not responsible for the cost of improved building access. Disabled people are part of society and it is society's responsibility to take care of them. Therefore, the cost of providing inclusive building access should be met by the New Zealand government, through taxpayer revenue, in the same way as other social programs such as pensions and health care are financed. If taxpayers were more aware of the needless trials suffered by disabled people in trying to access buildings and more aware of the likelihood that as they age, they too will probably experience an access problem, they would support the use of their taxes to improve accessibility. If the government mandates provision of access in the building design and provides subsidies to implement accessible features, the building professionals would be pleased to comply. The final step in improving accessibility is monitoring and enforcement. In order to operate, New Zealand's public buildings are required to have a Building Warrant of Fitness (BWOF), with critical features, such as the fire protection facilities and emergency lighting checked annually as a condition of the BWOF renewal. If the accessible facilities were added to the BWOF list, the problem of maintaining compliance would be solved.

The fourth objective was to assess the potential economic benefit to New Zealand's tourism industry from increased access to public buildings for locals and international visitors. The work in objectives one and two identified buildings such as sports stadiums, bars, shops, motels/hotels, restaurants and theatres/cinemas (all critical to visitors) as some of the most inaccessible public spaces. The research showed that the accessible tourism market is sizeable and, with an increasing aging population, is predicted to increase rapidly in the future. Providing a (public) built environment that meets the needs of the accessible tourism market is an enormous business opportunity for New Zealand's tourism sector.

The final objective was to recommend ways to improve the accessibility of New Zealand's public buildings through the three drivers of legislation, empathy and economics. The research has identified the key disability, construction, tourism, and government stakeholders and illustrated different modes of communication for each of these parties. The research outputs include presentations to disability and advocacy organisations, newsletters and Quick Fact sheets for construction practitioners, discussions on tourism platforms, and a petition to the New Zealand government. Finally, the research has shown two important ways for universities to help achieve inclusive public buildings; firstly, by fostering increased interest in research related to

accessibility and secondly, by including Universal Design principles in the construction degree program to ensure that future building professionals have a greater understanding of the importance of inclusive buildings.

5.2 Implications and recommendations

The researchers, in close collaboration with disability stakeholders, have identified the main accessibility barriers in New Zealand's public buildings. They have questioned construction professionals and people working in public buildings to assess their awareness of inclusive buildings and they have investigated New Zealand accessibility legislation. They have quantified the value and business potential of accessible tourism based on access to New Zealand's public buildings, and they have illustrated the role of academia in promoting greater awareness of the problems faced by people who experience disability in accessing buildings. They have provided guidance to construction practitioners on the experience of disabled people and on how to make buildings more accessible. They have developed a petition on improving accessibility legislation for the New Zealand government. In the future, more will be done to communicate the research findings to the key disability, construction, tourism, government and academic stakeholders and to expand the research to accessible infrastructure and public transport.

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APPENDICES

Appendix A Stefanitsis, et al., (2025).

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8TH NEW ZEALAND BUILT ENVIRONMENT RESEARCH SYMPOSIUM
Holistic Living: Sustainable, Affordable, and Resilient Built Environment for All

Inaccessibility to the Built Environment for People with Mobility Challenges: Introducing Enforceable Accessibility to Public Buildings into New Zealand's Law

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Abstract
Governments and disability organisations try to understand the needs of people with mobility challenges (PWMC) and draft laws to protect them from discrimination. However, there is little concentration on accessibility. Therefore globally, much of the built environment (BE) is inaccessible to PWMC. The adoption of the Convention on the Rights of Persons with Disabilities (CRPD) gave the global disability population high hopes of creating universal design for everyone. Unfortunately, it did not. Accessibility is not strongly legislated for. Aotearoa New Zealand (NZ) has no specific accessibility law, which creates a gap in the provision of all-inclusive accessibility to the BE for PWMC. The study addresses this legal discrepancy by doing literature review and exploring the accessibility difficulties of PMWC in the urban environment in NZ using a questionnaire survey. Findings of this research show a gap in the provision of all-inclusive accessibility to the BE for PWMC and the level of difficulties in accessing buildings in NZ. The research will propose recommendation to mandate enforceable accessibility legislation into the BE within NZ that addresses the current inadequacies for universal design for everyone

Keywords
Accessibility, Convention on the Rights of Persons with Disabilities, Legislation, Mobility challenges, Universal design.

1 Introduction

Urban accessibility is an emerging issue (Groce, 2018). According to the World Health Organization, approximately 1 billion people globally live with a disability (WHO, 2024). As of 2024, the estimated population of New Zealand is 5,348,600. Additionally, data from the 2023 New Zealand Census indicate that 127,857 individuals reported significant difficulties with walking or climbing stairs (Stats NZ, 2023), suggesting that at least 2.4% of the New Zealand population are persons with mobility challenges (PWMC). Cieza (2018) argues that quantifying PWMC is challenging because statistics are constantly changing.

Historically, many researchers have considered access as the prime consideration for the disability movement (Barnes, 2011; Clarkson & Coleman, 2015; Goldsmith, 2012; Imrie & Kumar, 1998). Despite concurrent developments in disability law globally, much of the built environment remains inaccessible to PWMC (Iacovou, 2021; Tseng, 2019). The adoption of the Convention on the Rights of Persons with Disabilities (CRPD) in 2006, ratified by 186 countries (Grigoryan, 2023), has not significantly improved accessibility for PWMC (Gough, 2015). Article nine of the CRPD treaty, devoted entirely to accessibility, is not enforceable unless each country enacts relevant domestic laws (Pons et al., 2022). Furthermore, most lawyers are unfamiliar with the applicability of the CRPD to the built environment (Jackson, 2018).

Gleeson (2001) claimed that a crucially disabling characteristic of many cities is their inaccessible design. He also found that protective disability laws and regulatory access often conflict. This is evident in New Zealand law, which primarily focuses on discrimination (Forster et al., 2021). The Human Rights Act 1993 stipulates that access cannot be refused, but it does not require that it be provided to the built environment (BE). Additionally, it does not impose penalties for not providing access. New Zealand law is fragmented: The Building Act 2004 (BA) outlines construction requirements, and the Building Code, alongside Building Regulations (1992), specifies performance standards. The NZS 4121 standard does not claim to be law but refers the reader to acts such as the Human Rights Act (HRA). The purpose of NZS 4121 is to provide workable solutions for designing buildings and facilities accessible to people with disabilities. However, a building that complies with legal standards may still be inaccessible if mobility scooters cannot maneuver within the space allowed by these standards (Dutta et al., 2011).

This study addresses this legal discrepancy by doing literature review and exploring the accessibility difficulties of PMWC in the urban environment in NZ using a questionnaire survey. The paper begins by reviewing the issue of accessibility for PWMC, covering five important aspects: accessibility, universal design, the Convention on the Rights of Persons with Disabilities (CRPD), the law, and the Americans with Disabilities Act (ADA, 1990). It then presents findings from a questionnaire surveying PWMC about their experiences with accessibility in public places in New Zealand.

2 Literature Review

2.1 Accessibility

The Declaration of Human Rights proclaims that “recognition of dignity and equal rights for all members of the human family is the foundation of freedom, justice and peace in the world,” (UN General Assembly, 1948). Accessibility recognition only began in the 1960’s with academics like Nugent, acknowledged as the father of accessibility. While working to break down barriers and improve rights of PWMC he found the most frustrating problems for PWMC are buildings and facilities (Nugent, 1961). His premise, barriers are created unknowingly by designers with the absence of an idea for good design and developed *kerb cuts.* Another pioneer, Selwyn Goldsmith, a wheelchair bound architect adopted Nugent’s thesis and created the *dropped kerb.* This benefitted everyone, for instance mothers with pushchairs which developed an interest in the universal principles of design (Guffey, 2020). About this time Ronald Mace another wheelchair bound architect with polio wanted the BE to be usable by as many people as possible and made an impact on a wider field (Ostroff, 2011). Mace assisted

in developing America's first building accessible code. His work is said to have been crucial in the evolution of the Americans with Disabilities Act of 1990 (ADA). He is credited with coining the term Universal Design (UD) (Hamraie, 2016).

2.2 Universal Design.

Uinversal Design (UD) drafted in the late 20th century has 7 principles (Null, 2013) as below:

1. Equitable use
2. Flexibility in Use
3. Simple and Intuitive Use
4. Perceptible Information
5. Tolerance for Error
6. Low Physical Effort
7. Size and Space for Approach and Use

Unfortunately, New Zealand has not incorporated them into an accessibility code, a hiatus which needs to be rectified as much of its built environment is still inaccessible (Tseng, 2019).

2.3 The Convention on the Rights of Persons with Disabilities

Human rights interest revived with the adoption of the CRPD (Durham et al, 2014). It is a UN international treaty, which came into force on May 03, 2008. The CRPD, containing fifty articles, has now been ratified by 186 countries (Grigoryan, 2023). Early attempts to persuade the UN General Assembly to draft a treaty concerned with the rights of persons with disabilities failed. However, continuous pressure from disability organizations led to governments and organizations agreeing to negotiate what they understood would be a legally binding treaty (Degener & Begg, 2017). From day one the proposal was daunting and the road to success was challenging. Controversy over interpretation continues to be prioritised today (Degener & Begg, 2017). According to Lang et al (2011), the CRPD "is the first legally binding international treaty" (p.208), with the right to enforce its principles. However, this enforceability is only binding between member states, with no legal sanctions enforceable against members that fail to honor their commitments. Member states are reviewed every four years (Ferrajolo, 2017), and while persons with mobility challenges (PWMC) were confident that non-compliant members would be held accountable, the reviewing committees merely make suggestions for improvement. This lack of enforcement was not initially understood by many PWMC, leading to disillusionment when they realised the treaty's limitations. Another perceived problem is the individual complaint mechanism, as reported by Elmas (2015), allows enforcement decisions to be made by committees composed of various state members, potentially imposing the will of their own jurisdictions and thus weakening the strength of the decisions. Article 9 devoted entirely to accessibility is one of the most argued articles. Without the rights granted under article 9, all other rights become meaningless claims (Seatzu, 2017). Consequently, the CRPD is possibly a document of foremost intent, which has not greatly benefited the PWMC.

2.4 The law

Each impairment is distinct and has its own accessibility needs. This must be understood by legislators drafting law, designers planning buildings, and the construction industry building

them. The major NZ problem is that it has no specific accessibility law. As discussed, accessibility is covered in the Building Act (BA), acknowledging that "a way of access" must be provided and the Building Code (BC) dictates how they must perform. The 4121 standards are much more explicit with exact measurements for compliance with the BC. However, they are not the law. Their purpose is to provide guidance for those responsible for making buildings and facilities accessible with reasonable and adequate provision of understanding those people who are to use them. For some years there have been interpretation challenges between the BC and the 4121 standard which should have been updated years ago (Malatest, 2014). Australian laws also come under fire for its lack of clarity and inability to reflect the lived experiences of PWMC needs. This results in weak law which does not consider the accessibility needs of PWMC in the built environment (Jackson, 2018). Similarly, the Equality Act 2010 in the UK concentrates on discrimination and does not mention accessibility (Fell, & Dyban, 2017).

2.5 The Americans with Disabilities Act ADA (1990)

This act was considered by most as the international gold standard of disability law, expected to have a powerful effect on the lives of PWMC as well the whole disability population. It intended to offer an indisputable mandate against discrimination for all people with disabilities (Diller, 2000). A significant percentage of people with disabilities who responded to a survey believed that things had improved since the ADA enactment. However, the 1998 National Organisation of Disability/Harris Survey of Americans with Disabilities found a clear majority thought there had been no change. The main disappointment was the interpretation of federal judges who often lessened the reach of the act. This created a unexpected backlash against a law which was thought to be the liberator of inaccessibility (Krieger, 2010).

Congress realised a lower limit was needed to qualify as disabled. They amended the act by the ADA Amendment Act of 2008, which did not result in accessibility for all as hoped. Ten years after the ADA was amended, Porter, (2018) posits that numerous Courts seem unaware that it was amended. Not only is judiciary ignorance to blame, but also those overseeing accessibility policies. Da Nevile et al. (2019) note that these officials often lack empathy for PWMC. To mitigate these issues, more PWMC must be involved in the implementation of disability law; otherwise, they will continue to face substantial obstacles in their daily lives despite the existence of mandated disability laws designed to protect them.

3 Research Methodology

This study employs a mixed methods approach to gather data and evaluate the problem in detail (Jackson & Nowell, 2021). The findings from the literature review indicated that, despite nearly 60 years of academic research into access barriers for persons with mobility challenges (PWMC), little has changed regarding inaccessibility to the built environment (BE). To understand why, this study surveyed PWMC across New Zealand to explore the accessibility issues they encounter in urban environments. The snow-ball technique was used to recruit participants for this study. The researchers first approached retirement villages, then decided to contact a broad range of disability organisations to include a diverse and particularly younger, socially active demographic to ascertain their needs. We also encouraged participants to share our survey with fellow PWMC.

Participants were asked to rate the level of accessibility difficulties at 26 different locations on a scale from 1 (easy) to 5 (very hard), with an additional option for 'I don't go there.' The survey inquired about the most significant problems participants face when accessing public buildings, shopping malls, and hospitals. The final question led to a blank page with an open-ended request for their views on any experienced accessibility gaps and suggested improvements. The study aimed to include as wide an age range of PWMC as possible and, from approximately 400 requests, received 123 responses from individuals aged 40 to 88. Table 1 summarizes the mobility devices used by the participants: nearly 32% of respondents use wheelchairs, about 18% use walkers, and a similar percentage use canes, while some reported relying on staff assistance or not using any mobility aids at all.

Table 1: Mobility devices

Mobility devices	**Number of respondents**	**Percentages**
Wheelchair	39	31.7%
Walker	23	18.7%
Cane	22	17.9%
Mobility scooter	13	10.6%
Powerchair	3	2.4%
I rely on staff	2	1.6%
I do not use a device	21	17.1%
Total	123	100%

4 Findings and Discussion

The initial phase of the analysis focused on identifying common places visited by PWMC Participants were asked to assess the accessibility difficulties they experience at 26 listed locations. Table 2 details the frequency with which participants visit these locations.

Table 2: Location and frequency

Location	**Number of respondents**	**I do not go there**	**%**
Supermarket	116	7	6%
Shopping mall	111	12	10%
Hospital	118	5	4%
Marae	38	85	69%
Doctor's office	118	5	4%
Dentist	100	23	19%
Bank	100	23	19%
Hairdresser	102	21	17%
Restaurant/bar	108	15	12%
Cinema/theatre	93	30	24%
Library	104	19	15%
Pharmacy/chemist	119	4	3%
Bus stop	64	59	48%
Community centre	73	50	41%
Church	48	75	61%

Airport	96	27	22%
Museum/art gallery	91	32	26%
Government building	83	40	33%
Public toilet	104	19	15%
Hotel	90	33	27%
Sports stadium	51	72	59%
Gym	42	81	66%
Park/public garden	111	12	10%
Local dairy	97	26	21%
Small shop	107	16	13%
Petrol station	79	44	36%

The findings highlight several frequently visited locations by participants, including shopping malls, supermarkets, and healthcare facilities such as hospitals, doctors' offices, and pharmacies. Participants were subsequently asked to evaluate the accessibility of 26 locations, rating them on a scale from 1 (easy) to 5 (very hard). The results of this assessment are summarized in Table 3.

Table 3 the level of accessibility difficulties to the locations

Location	Number of respondents	Minimum	Maximum	Mean	Std. Deviation
Sports stadium	51	1	5	3.24	1.335
Public toilet	104	1	5	3.13	1.405
Small shop	107	1	5	2.94	1.516
Cinema/theatre	93	1	5	2.83	1.324
Gym	42	1	5	2.79	1.440
Bus stop	64	1	5	2.73	1.428
Hotel	90	1	5	2.64	1.266
Government building	83	1	5	2.61	1.305
Park/public garden	111	1	5	2.61	1.288
Local dairy	97	0	5	2.61	1.469
Museum/art gallery	91	1	5	2.60	1.255
Restaurant/bar	108	1	5	2.58	1.269
Dentist	100	1	5	2.52	1.306
Airport	96	1	5	2.44	1.312
Marae	38	1	5	2.32	1.141
Hairdresser	102	1	5	2.22	1.376
Hospital	118	1	5	2.21	1.319
Community centre	73	1	5	2.19	1.232
Church	48	1	5	2.19	1.179
Petrol station	79	1	5	2.11	1.377
Bank	100	1	5	2.09	1.264
Library	104	1	5	2.06	1.213
Doctor's office	118	1	5	1.99	1.136
Shopping mall	111	1	5	1.99	1.124

Pharmacy/chemist	119	1	4	1.87	1.033
Supermarket	116	1	5	1.79	0.991

The survey results indicate varying levels of accessibility difficulties at different locations for people with mobility challenges (PWMC). Two locations, a sports stadium and a public toilet, have mean scores greater than 3, suggesting they are perceived as average to difficult to access. Twenty locations have mean scores between 2 and 3, indicating minor to average accessibility issues. Furthermore, four locations—doctor's offices, shopping malls, pharmacies/chemists, and supermarkets—have mean scores between 1 and 2, reflecting minor to easy accessibility for PWMC.

The participants were asked to specify the most significant problems when they are accessing the location. Table 4 below presents the results of the summary from respondents' comments against the NZS 4121.2002 Design requirements for accessibility for different features of a building.

Table 4:The most significant problems of accessibility

Features	**NZS 4121:2001 Desgin requirements**	**Public buildings**	**Shopping mall**	**Hospital**
Entrance	• Even and slip resistance surface must be 900 mm or wider	• Uneven surfaces • Signage to main entrance not always visible	• Uneven pavements. • Small shop entrances cluttered	• Steps or little ledges at main entrance
Doors and opening	• Can be easily opened • Space to manoeuvre	• Doors often open outwards • Not enough space to turn.	• Metal strips in shop doorways hard to cross in wheelchairs	• Doors close too quickly
Stairs	• Each stair must be the same size • Handrails provided at both sides	• Stairs are sometimes too narrow • Often there are no handrails	• Only escalators are prominent, and lift is some distance away	• Handrails on one side only • Heavy doors at foot of stairs
Ramps	• Must be slip resistant. • There must be a landing at every 10 metres	• Ramps are sometimes too steep • Sometimes there is no ramp	• Sometimes ramps are too steep at entrance • Interior ramps can be hard to find as there is poor signage	• Low lip at foot of ramps difficult to get front wheels of wheelchair over
Toilets	• Doors should open outwards • Grabrails must be positioned within reach	• Heavy doors are too hard to open • Grab rails are sometimes out of reach	• Several accessible toilets are difficult to manoeuvre wheelchairs into	• Heavy doors to access toilet block are hard to open
Carparks	• Disability parks must be close to	• Sometimes there is a step down from park to	• Sometimes they are too far away from buildings	• Too few disability carparks

	building and well signed	pavement from park

One significant issue reported by persons with mobility challenges (PWMC) is the difficulty in maneuvering their assistance vehicles within public buildings. This challenge aligns with findings by Church and Marston (2003), who note that current legislation still does not adequately address accessibility needs. Another prominent concern is the presence of heavy doors, particularly at the entrances and exits of accessible ramps. Kapsalis et al. (2024) highlighted that these doors are often too heavy for PWMC to open independently. Chigunwe (2019) emphasized that this issue is notably problematic for women with physical disabilities. Neven and Ectors (2023) also pointed out that even when accessible transport is available, the inaccessibility of buildings due to these heavy doors prevents PWMC from entering.

The reason for this is sometimes attributed to the lack of laws mandating improved accessibility for PWMC. However, research suggests that the ADA, which is considered globally to be the gold standard, was unable to protect PWMC adequately. This was due to the narrow interpretation of what defines disability by federal judges, resulting in many significantly disabled people being outside the protection of the law (Krieger, 2010).

5 Conclusion

Preliminary findings from the responses of people with mobility challenges (PWMC) in New Zealand suggest that they found access problems from minimal to very significant difficulties when accessing many locations, with inadequate space to manoeuvre assistance vehicles and heavy doors that are difficult to open.

Despite the enactment of the Americans with Disabilities Act (ADA) in 1990, which is considered the gold standard of mandated disability law in the USA, similar accessibility issues persist globally. The United Nations Convention on the Rights of Persons with Disabilities (UN CRPD), adopted with high hopes by disability organizations worldwide, has also not fully met its expectations for enhancing accessibility. Research reveals that many PWMC feel disillusioned, partly due to the lack of enforcement and the narrow judicial interpretation of what qualifies as a disability. This restrictive view has left many significantly disabled individuals without legal protections. It would be logical to expect a significant improvement in accessibility globally for PWMC with disability organisations achieving a high profile while constantly striving for improved accessibility. The introduction of the mandated ADA and the establishment of the United Nations CRPD have not greatly improved the quality of life globally for PWMC. This is despite the CRPD requiring all member nations to report on their progress approximately every four years at which time the CRPD reviews and comments on their progress.

Additionally, disability law in New Zealand is fragmented. The NZS 4121 standards are divorced from the legislation to which they apply, and the legislation is opaque and not definitive. If this and public indifference do not change, PWMC will continue to be faced with obstacles that challenge their potential quality of life which surely is the right of everyone as affirmed by the UN Declaration of Human Rights. Unless a mandated enforceable accessibility law is established in New Zealand, evidence strongly suggests PWMC will continue to face accessibility challenges and be deprived of the quality of life which non-disabled persons enjoy.

This study has some limitations due to the relatively small participation rate of people with mobility challenges (PWMC), representing about 10% of New Zealand's total PWMC population. Nevertheless, the survey successfully captured a broad spectrum of PWMC, spanning various ages and degrees of disability. Future research aims to collaborate with additional organizations to secure a more extensive sample size and enhance the breadth of participant diversity.

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Appendix B Quick Fact Sheet for Building Practitioners

Making buildings more accessible for people who experience disability.

Quick Fact Sheet

Background

One in six New Zealanders experience a disability that impacts on their mobility, vision, hearing, or learning, neurological, neurodevelopmental conditions. Nearly two-thirds are aged 65 or older, and many will acquire an impairment as they age. If we make buildings more accessible for disabled people, this will also help people who are pregnant, pushing a pram, walking with luggage, using crutches or experiencing a temporary impairment.

How can buildings be made more inclusive for people who experience disabilities?

Here are some simple things to do:

- Prioritise the safety of people who experience disability by providing good lighting and nearby parking.
- Keep internal access routes clear of obstacles such as movable signs, bins, merchandise stands and decorative plants.
- Avoid signs and fixtures such as fire extinguishers protruding at head or body height.
- Provide good, clear signage to help wayfinding. Universal signs (like arrows), with large colour contrast between symbols and background, that are placed between 5 and 6 feet above the floor, ensure easy access for all people.
    - If your visitors include people in wheelchairs or children, consider placing signs slightly lower.
    - Viewing distance: Adjust the height based on how far away people will be viewing the sign.
    - Building layout: In large spaces like lobbies, signs might need to be placed slightly higher to be visible from further away.
- Not everyone can see signage, so also provide audible and braille instructions.
- Make sure that accessible bathrooms are not used for general storage – they are spacious because wheelchairs need extra room to turn.
- Use colour contrast doors fitted with handles or levers that are easy to use for people with limited hand function. If doors are motion sensitive, ensure the sensors can detect children, people of short stature and users of mobility devices.
- Place benches to the side of access routes, on hard surfaces (not grass), with space at the end for a pram, wheelchair or mobility scooter. Providing some seating with arm rests assists by providing leverage to push up on.

- Maintain outdoor access paths keeping them clear of vegetation (including tree roots and branches), with level surfacing, gentle kerb cuts, and ramps instead of stairs. SOS – Safe, Obvious and Step-free.
- Make sure that building access security features (such as PIN code entry) can be reached from a seated position. Use simple visual and audible instructions on how to enter the building and where to get help. Where possible provide braille signage.
- In emergency evacuations, have a plan for people who cannot hear audible alarms and avoid narrow escape paths with heavy, manual fire doors.

What PWD want you to know:

- Don't assume people who experience disability are less able just because they look different.
- Every person is different.
- An impairment can be visible, for example, requiring a wheelchair, guide dog, or white cane.
- An impairment can be invisible, for example, deafness, low vision, autism, vertigo, or anxiety.
- People who experience disability should not have to explain or justify their actions – they are going about their business to manage their world.
- Don't stare, point, judge, or ask intrusive questions, such as "What's wrong with you?", "Can you have children?", "Why are you catching a bus at this time of night?" Only ask questions that are relevant to your interaction with them and be sensitive to who might overhear their answers.
- Don't interfere without being asked. Always ask if assistance is needed and if so, how you can help. Touching people or their equipment can be intrusive and if unexpected can be frightening.
- Don't offer sympathy; it is offensive to say things like "Can I pray for you?"
- Do offer help if you see a person struggling but begin by asking "Can I help?", and "How can I help?"
- Having offered to help, give them time to understand what is needed and do not be offended or hurt if the person doesn't want your help.
- Going to new places may be harder for a person who experiences disability; they may need more time to plan their trip or may find the journey impossible. For example, a person in a wheelchair may not be able to get up a step in the path from their home to their destination.

Remember this:

- One in six people in New Zealand has a disability. As we age, we are more likely to require help with access – so it's potentially your problem in the future. Any improvements you make now will help you later.

- Be positive. Instead of saying “No, it’s too hard to deal with people who experience disability”, start saying “I can do better” and then do it!
- Treat everyone courteously, exactly the same way that you would like to be treated.
- Those who engage with access and inclusion find a great return on investment and increased customer loyalty.

Information provided by: Claire Flemmer, Massey University; Alison McIntosh, Auckland University of Technology

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Appendix C Economic Benefit to New Zealand's Tourism Industry

The business case for making New Zealand's public buildings accessible and inclusive

Introduction

Public buildings, including restaurants, accommodation places, shops, museums, and entertainment venues, form a vital part of the visitor experience in New Zealand. Accessible infrastructure within these buildings is increasingly critical as global trends in accessible tourism and demographic changes drive demand for inclusive facilities. Accessible public buildings have the potential to deliver significant economic benefits, not only by enhancing local residents' access and inclusion, but also domestic and international visitor satisfaction, by expanding New Zealand's tourism market to include travellers with disabilities and older adults who have access requirements. This report provides a business rationale, drawing on global and national data, for making New Zealand's public buildings accessible and inclusive to everyone. The main social imperative is the improvement of accessibility for users with disability, both domestically and internationally, allowing them greater participation in society, more independence, equity and dignity and an improved quality of life.

Economic contribution of public buildings to New Zealand tourism

Tourism is a cornerstone of New Zealand's economy, contributing substantially to GDP, employment, and international trade. Many of the services and employment related to the tourism industry take place in public buildings, including retail, dining and entertainment.

The Tourism Satellite Account (TSA[1]) results showed that, for the year ended March 2023:

- Total tourism expenditure in New Zealand was $37.7 billion.
- Tourism directly and indirectly contributed $22 billion (6.2%) to New Zealand's GDP.
- International visitors spent $10.8 billion. Domestic tourism generated $26.9 billion in revenue, highlighting the importance of inclusive infrastructure for both international and local visitor markets.
- The tourism industry directly and indirectly supported 317,514 jobs (11.3% of total employment), highlighting its social and economic relevance.

Improving accessibility in New Zealand's public buildings is essential to maintaining and growing these economic benefits by expanding the customer base, extending tourist stays, and increasing visitor satisfaction. Accessible public buildings can increase the inclusivity of the tourism sector, allowing more tourists to participate, providing inclusive employment, and boosting overall

economic returns. If a building owner can equate improved building accessibility with increased revenue, they will view any improvements as worthwhile (a return on investment) during the building operation. This too will promote more universal design of new buildings and upgrading older and heritage buildings which in turn will drive more access and inclusion.

Economic value of accessible tourism and opportunity for growth

A sizeable market opportunity

The accessible tourism market is one of the fastest-growing segments in the global tourism industry. The market for accessible tourism comprises people with disabilities, seniors, their carers/companions and other people with access requirements, for example, parents travelling with children in prams and multi-generational groups. Several key statistics illustrate the size of the international accessible tourism market:

- The accessible tourism market represents 25% of global tourism[2].
- The accessible tourism market is larger than the populations of China and Europe combined[3].
- The accessible tourism market is growing three times faster than any other tourist market[4].
- The potential international accessible tourism market comprises 1.8 billion people who live with a disability, or 15% of the global population, with mobility impairments being the most common. When family, friends, and carers are considered, this number increases to 3.4 billion people[5]. Accessible infrastructure increases their ability to participate in tourism activities, benefiting both the individuals and the destinations they visit.
- The ageing global population is a key driver of growth in accessible tourism. By 2025, one in eight international trips will be taken by a senior aged 60 years and over, and the size of this market will almost double by 2030. By 2030, the global ageing population is expected to grow by 40% to 1.4 billion people[6]. Many older adults have mobility, vision, or hearing impairments that require accessible facilities. Older adults are among the most active travellers, with higher disposable incomes and more leisure time.
- 50% of people with access requirements would travel more if tourism facilities, services, and experiences at a destination were perceived to be accessible and inclusive[7].
- By 2050, it is estimated that one fifth of the world's population will have some access requirement[8].

These trends underscore the importance of ensuring that New Zealand's public buildings are accessible to meet the growing demand for inclusive travel experiences. Despite the reported size of the accessible tourism market, the market remains underserved globally, including in New Zealand. Improvements in accessibility could unlock significant untapped demand. Meeting this demand requires accessible infrastructure across public buildings, which will become a competitive advantage for destinations that prioritise inclusivity. There is evidence that New Zealand has already fallen behind its competitors, in particular, Australia, even though New Zealand is more reliant on tourism as a major invisible export[9].

A valuable market opportunity

Statistics also show the potential economic value of the sizeable international accessible tourism market:

- People with disabilities are active travellers. Disability reaches 73% of consumers and influences over USD 13 trillion in annual disposable income[10].
- People with disabilities who do not travel but want to, could contribute an additional 2% in spend if industry improvements were made[11].
- People with access requirements travel with companions and carers, resulting in an economic multiplier effect of 2.5[12]. If businesses do not cater to people with access requirements, they will therefore lose the business of on average two to four people.
- The retiring baby boomer generation will control over 50% of total tourism spend and demand different experiences to generations that have preceded them. While they might acquire age related disabilities, they will not necessarily identify with the traditional disability sector, meaning they will expect accessible and inclusive tourism facilities, services, and experiences to be provided by the mainstream industry[13].
- People with disabilities travel more often and in larger groups, stay longer and spend more money, return to the same destinations, and pass on good experiences through word of mouth to family and friends[14].
- Research has shown that businesses who provide accessibility provision benefit from increased visitor satisfaction, repeat business, increased turnover and improved reputation[15].

The accessible tourism market is shown to have considerable spending power and presents a compelling business case for accessibility provision. When access barriers to public buildings are unlocked for this market, their spending would increase and greater economic potential could be realised. Accessible tourism also has a multiplier effect, as visitors with disabilities often travel with family or companions, increasing group spending. Businesses within public buildings that embrace accessibility and inclusion will benefit from access to a broader customer base, greater visitor satisfaction and loyalty, increased revenue and economic sustainability whilst also providing a universal experience that caters to, and includes, everyone.

The New Zealand case

Building for everyone benefits the lives of the 24% of the New Zealand population who live with disability. New Zealand's population is aging, and age correlates with disability, so accessibility impacts everyone. New Zealand statistics illustrate the growing importance of providing access and inclusion:

- 59% of New Zealanders aged 65 years and over live with a disability[16].
- The number of New Zealanders aged 65 years and over doubled between 1991 and 2020, to reach 790,000, and this number is projected to double again by 2056. By 2030, it is expected that 19-21% of New Zealanders will be aged 65 years and over, compared to 16%

in 2020 (0.79 million). By 2048, this proportion is expected to reach 21-26% (1.36-1.51 million), and by 2073, 24-34% (1.61-2.22 million)[17].

- 83% of New Zealanders with access requirements regularly engage in domestic travel, contributing to local economies, however, more than half are denied access to businesses because of their inaccessibility[18].
- The size and value of the international accessible tourism market in New Zealand has not been measured but is likely to reflect global trends. Age and disability affect the visitor profiles of all inbound tourist markets to New Zealand[19].

Attention to the accessibility of New Zealand's public buildings is needed to leverage the potential business case for accessible tourism. Accessibility improvements in public buildings, such as ramps, elevators, accessible restrooms, and clear signage, are shown to directly influence visitor satisfaction. Inaccessible facilities discourage repeat visits and create negative impressions. These barriers present an economic loss to New Zealand businesses.

While the New Zealand Building Code mandates certain accessibility features, compliance is inconsistent, particularly in older buildings. Many public buildings, particularly older structures, lack accessibility features such as ramps, tactile surfaces, or hearing loop systems. Inconsistent application of New Zealand's Building Code and limited awareness among business owners exacerbate the problem[20].

Conclusion

New Zealand's public buildings directly support local residents', domestic and international visitors' activities, with their accessibility playing a crucial role in economic performance. Ensuring New Zealand's public buildings are accessible and inclusive enhances visitor satisfaction, increases revenue for business owners, builds destination loyalty and provides long-term benefits for the economy. Although progress has been made, challenges remain in ensuring public buildings are accessible. Ensuring awareness of the business case for making New Zealand's public buildings accessible and inclusive is crucial for unlocking important economic and social benefits.

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The role of the university in making the built environment more accessible and inclusive for people with disability: A case study from New Zealand

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Abstract
The need to reduce inequality for people with disabilities is a strong theme in the United Nations Sustainable Development Goals. Cities and communities should be inclusive, but the Built Environment has many buildings and spaces with problematic access features that make full participation impossible for this demographic. Universities can play an important role in addressing the issues underlying barriers to access and in providing clear steps for improvement and inclusion. The role involves interacting with all the key stakeholders including people with disabilities, disability advocacy organisations, construction professionals, legislators, students and the general public. This research demonstrates the role in a case study project by two New Zealand universities. A panel of experts with a lived experience of different disabilities provided oversight. The academics designed coursework to facilitate student engagement in the concepts of Universal Design and supervised student research involving building owners, advocacy organisations, construction professionals and people working in buildings. Presenting the research to audiences of legislators, construction professionals, advocacy groups and others interested in accessibility helped raise awareness amongst the stakeholders and led to a petition to the government with recommendations for achieving improved accessibility in the Built Environment. Other outputs included fact sheets for construction businesses, conference presentations, reports and articles for academic journals. The research plan may provide a useful roadmap for other academics to follow in their attempts to improve accessibility and inclusion in the Built Environment for people with disabilities.

Keywords
Accessibility, disability, Built Environment.

1. Introduction

The number of people with disabilities (PWD) is substantial. It is estimated at 16% of the world's population (WHO 2023) and 26% of the U. S. population (CDC 2020). In New Zealand 24% of the population are PWD, with 59% of all PWD aged 65 years or older (MacPherson, 2014). Reducing inequality and promoting inclusivity for this demographic is prominent in the United Nations Sustainable Development Goals (SDGs). The goals describe empowering "social, economic and political inclusion for everyone including PWD" (SDG 10), promoting inclusive accessibility in urban planning, public spaces and transportation (SDG 11), providing inclusive education (SDG 4) and "full and productive employment" for PWD (SDG 8) (United Nations 2015). However, the goals are unachievable if the buildings and spaces associated with these activities, such as parks, entertainment venues, government buildings, transportation, schools, workplaces and their connecting routes, are inaccessible to PWD. Unfortunately, the Built Environment remains challenging for PWD and efforts to address this through the principle of Universal Design (UD) are slow (Zallio and Clarkson, 2021; Watchorn *et al.* 2021).

Providing good access for PWD is complex for two reasons. Firstly, the type of disability may involve physical, sensory and/or intellectual impairment and each places different, and sometimes conflicting, requirements on building design (Carlsson *et al.* 2022). Secondly, there are many stakeholders involved in the process of collating the varying needs of PWD, turning those needs into well-defined design specifications and implementing, monitoring and enforcing the changes to the Built Environment. The implementation, monitoring and enforcement tasks will be the done by construction practitioners, many of whom acquire qualifications from teaching institutions such as universities. The aim of this research is to use a case study to illustrate a possible role of the academy in providing a pathway for improving Built Environment accessibility for PWD in the New Zealand context. The research objectives are:

- To identify the stakeholders and define their contributions to controlling accessibility.
- To collect data on accessibility issues from the perspective of different stakeholders.
- To demonstrate how the barriers to accessibility for PWD can be addressed in the academic environment in ways that maximise the impact/usefulness of the research.

The research is a collaborative effort by two New Zealand universities. It considers only accessibility in public buildings and spaces in New Zealand, excluding private dwellings and infrastructure. Other limitations include the participation of stakeholders living in New Zealand and only PWD who are adults, i.e., excluding children with disabilities and caregivers.

2. Literature Review

The efforts of researchers in the area of inclusive access to the Built Environment have mostly investigated a single aspect of the problem, such as defining the challenges faced by PWD, measuring building access features using auditing tools, investigating flaws in accessibility legislation, looking at the business case for improving accessibility and gathering the perceptions of people involved in

buildings (both construction professionals and building occupants). Section 2.1 provides an overview of these aspects. Relatively few researchers have examined the problem from a holistic perspective, considering two or more groups of stakeholders and their findings are presented in section 2.2.

2.1 Factors affecting inclusive access to the Built Environment for PWD

2.1.1 Access barriers for PWD

Most research has focussed on physical features that present access challenges for people with physical impairments, particularly related to mobility (Torkia *et al.* 2015). Some studies have looked at access barriers for those with sensory impairment such as vision and hearing (Ayoung *et al.* 2021; Jeamwatthanachai *et al.* 2019; Keerthirathna *et al.* 2010), but relatively few have considered the challenges of people with cognitive and neurodiverse impairments (Ijadunola *et al.* 2019; Kinnaer *et al.* 2016; Malcolm 2022). Many PWD have more than one impairment and/or impairments that vary in severity over time and the elderly make up the largest proportion of PWD (Perry *et al.* 2021). Aside from physical barriers, PWD are commonly exposed to negative treatment by other building occupants, and this can only be improved by raising public awareness of the experience of PWD (Heylighen *et al.* 2016; Fisher and Purcal 2017).

2.1.2 Measuring building access features

A variety of audit tools are used to measure physical features that provide access in the BE. They consist of checklists, usually adapted from the regional legislation, and customized for particular types of building, such as AIMFREE for gym assessment (Rimmer *et al.* 2017). They provide an efficient and consistent metric but are often regarded as a "tick-box" exercise that fails to capture the essence of UD, namely the "usability" of the space by PWD (Watchorn *et al.* 2023).

2.1.3 Accessibility legislation

Many countries that ratified the United Nations Convention on the Rights of Persons with Disabilities (UNCRPD 2006) have developed disability strategies and disability anti-discrimination legislation, coupled with building codes and standards in order to implement inclusive access for PWD (Whaley *et al.* 2024). These are comprehensive and strictly enforced in some countries such as the U. S., where lawsuits drive improvements in access (Eisenberg *et al.* 2024; Arditi 2017). However, in New Zealand they are ambiguous, and enforcement is minimal (Stewart, 2021; Calder *et al.* 2018). Forster *et al.* (2021) note the importance of clear, comprehensive policies, strict monitoring and significant penalties for non-compliance. Finally, communities drive political change and improved accessibility legislation (Larkin *et al.* 2015) but a key concern of policymakers is the fair use of funding resources for the benefit of the entire community (Saha *et al.* 2021).

2.1.4 The business case for improved accessibility

There is a tendency for construction professionals to design buildings with the minimum level of accessibility that just meets the required legislative compliance in order to minimise the project cost (Zallio and Clarkson 2021). Going beyond minimum access features can provide economic benefits to construction stakeholders, particularly in the tourism and transportation businesses (Terashima and Clark 2021). The PWD population is immense and is predominantly elderly, with large discretionary

income. Therefore, this demographic represents an enormous potential market for those businesses who cater to their accessibility needs (Yin *et al.* 2018).

2.1.5 The perspectives of building professionals and building workers

PWD have a poor opinion of building professionals (designers, managers and owners), viewing them as the proximal cause of poor accessibility in the BE and failing to acknowledge their need to be competitive (Watchorn *et al.* 2021). Building professionals, in turn, are reluctant to assume the responsibility and cost of providing better access and are generally apathetic about the problem (Kadir *et al.* 2018; Watchorn *et al.* 2024). The same is true of people working in buildings, such as restaurants and shops; they perceive the provision of better access features and training programs as factors that reduce the profitability of their businesses (Flemmer and McIntosh, 2024).

2.2 Holistic perspectives on inclusive accessibility in the Built Environment

Recent research into providing more inclusive access to the Built Environment for PWD recognises the complexity of the problem and includes:

- The need to consider the different activities and occupations of PWD in buildings and aim at true usability rather than legislative compliance (Watchorn *et al.* 2021).
- The importance of co-design with PWD "user-experts" consulted at all stages in producing new buildings (Watchorn *et al.* 2024).
- Multiple stakeholders including occupational therapists, architects, PWD and their support organisations, government regulators and communities need to be involved in order to implement UD successfully (Eisenberg *et al.* 2024; Saha *et al.* 2020; Larkin *et al.* 2015).
- The need to include information on UD in construction-related degrees (Watchorn *et al.* 2024; Larkin *et al.* 2015).
- Using a variety of knowledge motivation strategies, such as videos, photographs and games to inform decision makers, urban planners and the community about non-inclusive accessibility, while recognizing that this does not necessarily result in active change (Labbé *et al.* 2020).

In summary, a review of the literature highlights the complexity of providing inclusive access to the Built Environment and points out some of the factors that hinder progress. Chief amongst these is the failure to consider inclusive access holistically. The numerous stakeholders should all be consulted, but their different priorities, poor inter-communication, lack of knowledge and ambiguous responsibilities make the consultation process difficult. Community involvement is essential for voter interest, which in turn drives policymakers to change legislation. Education of the future building practitioners is another key element in achieving better accessibility for PWD. The problem of how to engage all the stakeholders in a way that maximises the likelihood of achieving improved accessibility for PWD is the research gap that is addressed here.

3. Research Methodology

The research began in 2023 and will end in February 2025, so this article reports the preliminary activities and results. The first stage, addressing Objective One, involved identifying New Zealand stakeholders (SH). Chief amongst these are PWD (SH1), organisations supporting PWD (SH2) and organisations advocating on behalf of PWD (SH3). Other stakeholders are the New Zealand legislators (SH4), people working in the construction sector (SH5), people working in public buildings (SH6) and postgraduate students from Massey University's School of Built Environment (SBE) and from Auckland University of Technology (AUT) (SH7). The academics selected from SH1 to SH3, seven people with a lived experience of disability to form an Accessibility Advisory Panel (AAP) who provided oversight on all stages of the research. During the selection, they established a wide network and offered presentations on the research project to increase awareness amongst the SH1 to SH3 members. Figure 1 shows the interactions between stakeholders. Each line represents two-way interaction. For example, the top tier consists of stakeholders with a lived experience of disability (PWD, disability organisations and advocacy groups). They form the advisory panel members who provide information to the academics and review information from the academics. The academics collect data from the PWD and advisory panel and communicate the research findings back to them. The bottom tier consists of students (who will join the construction sector workforce), construction practitioners and people working in buildings. The academics teach the students and supervise their research, while simultaneously interacting with the construction practitioners and people working in buildings.

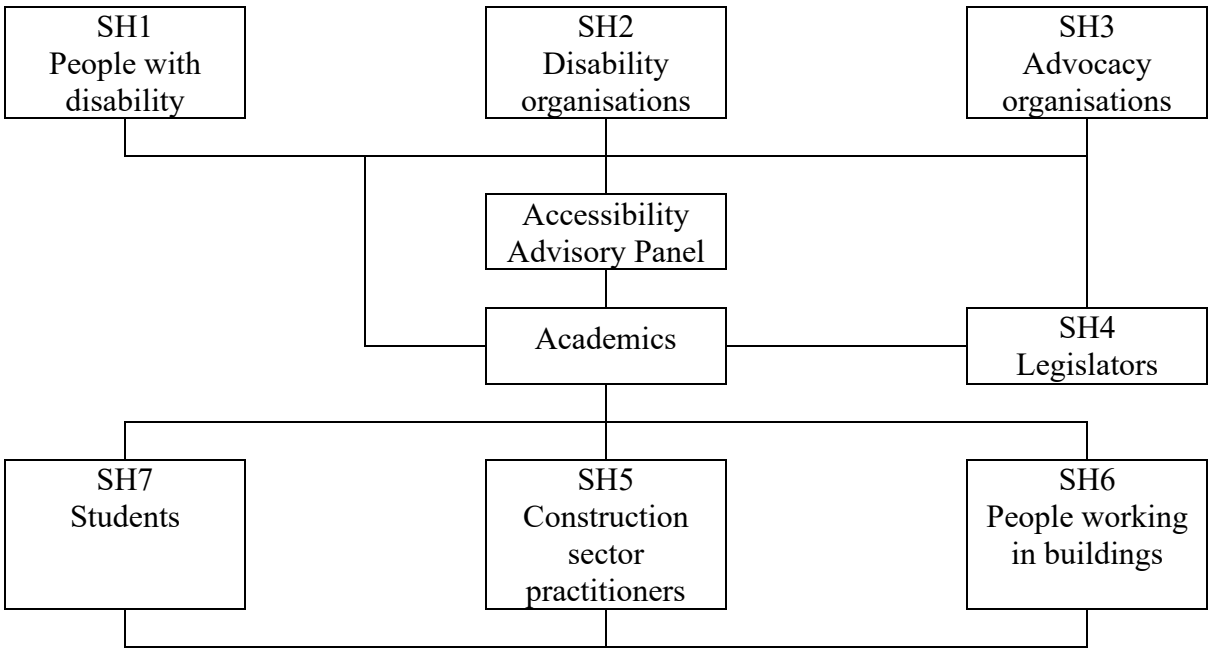

Figure 1. Relationship between the academics, Accessibility Advisory Panel and the stakeholders (SH) in the research

The multiple roles of the academics were to:

1. Use their established network to collect survey data from the PWD on the challenges they experience when trying to access public buildings in New Zealand. The survey also

collected information such as type of impairment, use of assistive devices, age, work and health status. The AAP members co-designed and reviewed the survey questions and helped format one version of the survey for people with vision impairment. Other versions of the survey included a Qualtrics online format (distributed on organisation websites, newsletters, and social media) and a standard Word document for people preferring to respond offline. PWD could also dictate their survey responses by phone or in a Zoom meeting. The survey was activated on 30th September 2024 and run for two months. To increase the response rate, participants could opt to enter a lottery to win one of twenty $100 (NZD) gift vouchers.

2. Supervise students through course work and research to raise their awareness of the issues involved in providing better access to public buildings for PWD.

3. Disseminate useful information related to improving access to public buildings for PWD to legislators, people working in the construction sector, people working in public buildings and the academic community. The AAP reviewed and co-designed the research outputs.

The research involving a survey of PWD was reviewed by the Massey University Human Ethics Committee Ohu Matatika 1 and received ethics approval ID OM1 24/20 on 17/7/2024. During this review, the committee imposed two limitations on the survey respondents (PWD), namely that they had to be adult (18 years or older) and that they had to be able to provide their own opinion. The latter meant that the researchers had to exclude the opinions of caregivers and children with disabilities.

The AAP members had a range of impairments related to mobility, vision and hearing and were active participants in organisations representing those impairments (such as New Zealand Spinal Trust, Muscular Dystrophy and Deaf Aotearoa), as well as in organisations representing or advocating on behalf of all types of disability (CCS Disability Action, Making Trax Foundation, Be.Lab, and People First Taranaki). During panel member selection, many other organisations in the groups SH2 and SH3 were identified and agreed to provide access to the people in group SH1 through their organisations.

4. Findings and Discussion

The research ends in February 2025, so only preliminary results are reported here. Objective One, the identification of key stakeholders and their involvement in access to the Built Environment for PWD was discussed in the preceding section. The progress on collection of data on accessibility issues (Objective Two) and on maximizing the research impact (Objective Three) are discussed below.

4.1 Collection of Data on Accessibility Issues from the Stakeholders (Objective Two)

The AAP members provided their perspective on barriers to accessing public buildings and co-developed the survey questions for New Zealand's PWD (SH1). The survey was activated for a two-month period, beginning on 30th September 2024. Approximately 24% of New Zealand's population of 5.4 million people (Statistics New Zealand 2014, 2024) identify as having a disability. Power analysis (Calculator.net nd) indicates that a sample size of 281 survey respondents will provide statistical findings with a confidence level of 95% and a margin of error of ±5%. The number of responses currently exceeds this sample size, and statistical analysis will be done when the survey closes.

Preliminary data collected by students (SH7) includes survey data on the perspectives of 61 building professionals (SH5, consisting of quantity surveyors, construction site managers, project managers and architects), accessibility audits of case study buildings (10 shops, 10 libraries and 11 restaurants) and interviews with people working in the case study buildings (SH6). Table 1 summarises the main findings and detailed results are reported in Flemmer and McIntosh (2024).

The work has been extended to collect more data on the perspectives of building professionals, accessibility audits of churches, government buildings, gyms, university buildings, bus stations and train stations and interviews with the people working in those buildings. Data collection ends in February 2025.

Table 1. Summary of preliminary research findings

<table>
<tr><td colspan="4">Parameter: Perspectives of 61 New Zealand Building Professionals</td></tr>
<tr><td colspan="4">• No consensus on whether existing mandatory legislation is adequate or should be strengthened.
• Little knowledge of or interest in whether existing buildings meet the needs of PWD.
• Strong resistance to bearing the responsibility and cost of improved access features.</td></tr>
<tr><td colspan="4">Parameter: Perspectives of people working in case study buildings</td></tr>
<tr><td colspan="4">• Awareness of legislation and training relating to accessibility is better for people working in large shops and in government-funded buildings such as libraries compared with people in small shops and restaurants.
• Cost, lack of space, and lack of knowledge on implementation are the main barriers to improving accessible features in smaller case study buildings.
• Accessible features are mostly provided for people with mobility impairment. Little is done to cater to the access needs of people with other types of disability.</td></tr>
<tr><td colspan="4">Parameter: Range of compliance of case study buildings with NZS4121:2001 standard for accessible design</td></tr>
<tr><td rowspan="2">Building Type</td><td colspan="2">Compliance</td><td rowspan="2">Least accessible features</td></tr>
<tr><td>Range (%)</td><td>Average (%)</td></tr>
<tr><td>Shops</td><td>13 - 67</td><td>38</td><td>Access ramps, shelves, checkout counters</td></tr>
<tr><td>Libraries</td><td>40 - 100</td><td>92</td><td>Accessible parking, access ramps, aisle clearance</td></tr>
<tr><td>Restaurants</td><td>73 - 100%</td><td>89</td><td>Access ramps, accessible dining tables</td></tr>
</table>

4.2 Academic Roles Aimed at Maximising the Impact of the Research

4.2.1 Education of Students

The primary role of academics is education of students. Each year, approximately 200 students enroll in Masters degrees at Massey University's School of Built Environment (SBE), specializing in Construction Law, Quantity Surveying, Construction Management or doing a Master of Construction degree without specialization. They are the future professionals in the construction sector, with roles such as legal

advisors, quantity surveyors, project managers and facilities managers. To raise their awareness of the problem of accessibility of the Built Environment for PWD, all 200 students were required to do a review of the recent literature on this topic as part of a compulsory course in Research Methods. Students chose the topic that matched their specialization or their interest from the options listed in Table 2.

The assessment also required an explanation of the meaning of Universal Design and of the rights defined in the United Nations Convention on the Rights of Persons with Disabilities (UNCRPD 2006) relating to access to the Built Environment for PWD.

Table 2. Topics for an assessment in the Research Methods course (compulsory for all MConstr. Students)

Topic	Description
A	The cost and/or measurement challenges associated with implementing Universal Design in public buildings and spaces.
B	The construction management challenges in providing access in public buildings and spaces for users with a range of different disabilities
C	The way in which legislation (such as NZS 4121:2001 Design for access and mobility – Buildings and Associated Facilities) and practice (such as New Zealand's Disability Strategy policy) aim to control the accessibility of the built environment for people with disability.
D	The key accessibility challenges faced by users with a range of different disabilities (such as mobility, vision and hearing impairment) in accessing public buildings and spaces.
E	Studies that focus on measuring the accessibility of specific aspects of the public built environment, such as libraries, parks, etc.

Having completed that course, 25 to 30 of the masters students used the topic for their research course, doing projects such as auditing case study buildings, reviewing legislation on inclusive accessibility, reviewing global best practice, reviewing auditing tools, assessing the cost benefit analysis of making buildings more accessible, and investigating the opinions/knowledge of building professionals and people working in the Built Environment. The academic staff are also involved in supervising doctoral student research in improving accessibility for PWD and in the benefits of accessible and inclusive tourism to New Zealand.

4.2.2 Research Outputs for Stakeholders

Alongside the standard academic outputs such as journal articles and conference presentations, the academics established symbiotic relationships with the stakeholders, for example:

1. During the recruitment of members for the AAP, an academic researcher was asked to participate in a webinar by Access Matters Aotearoa (AMA) Trust, an advocacy group promoting improved accessibility for PWD in New Zealand supported by 56 disability-related organizations. The researcher presented collated data in the area and made recommendations for improving accessibility. They then helped AMA draft a petition to the government with nine actions that should be implemented to improve access for PWD. The petition was announced on the SBE LinkedIn site (6,000 followers) and currently has 672 signatures. The researcher and AMA will present it to the government. In return, AMA publicized the researchers' survey for PWD on the AMA Facebook page (441 members) and on LinkedIn (708 followers).

2. Building professionals (SH5) and people working in buildings (SH6) provided data in the SBE masters student research projects. In return, the academics used their research findings and advice from the AAP members, to write simple fact sheets and articles for the businesses and people assisting in the master's research. This helped increase the knowledge of the problem amongst SH5 and SH6.

The preliminary research findings exposed two important aspects; firstly, the responsibility for the cost of providing more inclusive access to the Built Environment, and secondly, the way to maintain and enforce the accessible features in public buildings. PWD feel that the stakeholders involved in providing buildings (i.e., the builders, architects, building owners and building managers) should bear the cost of providing accessible features. The construction sector stakeholders feel that this is an unfair burden on their businesses and cite cost as the main reason for not providing better accessibility. Since inclusive access is a societal problem, Flemmer and McIntosh (2024) opine that the cost should be born by all New Zealand taxpayers. Government subsidies for accessible features would be a strong motivator for construction sector stakeholders to provide more accessible buildings. Adding the accessible features to the building's Warrant of Fitness, alongside other critical features, provides a way to maintain and enforce the inclusive access in buildings (Flemmer and McIntosh 2024). These solutions were two of the nine recommendations in the petition.

5. Conclusions and Further Research

For several years researchers in the academic environment have worked on the problem of Universal Design and inclusive access to the Built Environment. However, a lack of involvement of all the key stakeholders has meant that many of their findings have been limited and most have not led to real improvement. This is hardly surprising because political activism is not the main function of the academy. If academics have a role, it must surely be the collation of data from all stakeholders in the research area and the drawing of conclusions as to what might be fruitful initiatives. We present a case study showing how this role has been handled by two universities in New Zealand. Firstly, symbiotic relationships between advocacy groups, disability organisations and academics led to the development of a petition with nine actions that the New Zealand government should take to improve access to the Built Environment for people with disability. The relationship amplified the exposure of the petition and increased the uptake of an academic survey collecting information from PWD on their experiences when trying to access public buildings. Future work will comprise the analysis of this data to get a more accurate picture of the research field and lobbying the government to act on the recommended steps.

Secondly, a mutually beneficial relationship between academics supervising student research and construction sector stakeholders facilitated access to data on case study buildings and on the perspectives of construction professionals and people working in public buildings. In return, fact sheets and short articles were used to increase the knowledge of these stakeholders on different aspects of accessibility in the Built Environment. Preliminary results show that many public buildings in New Zealand fail to provide good access to people with disabilities and that many construction sector stakeholders know very little about the need for Universal Design.

Finally, approximately 200 students per year will get Master of Construction degrees from Massey University's School of Built Environment and begin careers in the construction sector. The inclusion of information on different aspects of Universal Design in the mandatory courses of the master's program, means that future construction lawyers, quantity surveyors and construction managers will know more about this important topic. The case study has illustrated a collaborative effort between

all the stakeholders that can be followed by other academic institutions, ultimately helping to improve the accessibility of the Built Environment for people with different disabilities.

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