

# **Promoting universal design in public buildings**

## An action research study of community participation

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## **Attestation of Authorship**

I hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person nor material which to a substantial extent has been accepted for the qualification of any other degree or diploma of a university or other institution of higher learning, except where due acknowledgement is made in the acknowledgements.

Signed

A handwritten signature in black ink, appearing to read "Chie Copeland".

Dated            30<sup>th</sup> September 2014

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*Never doubt that a small group of thoughtful, committed citizens can change the world. Indeed, it is the only thing that ever has.*

– Margaret Mead, 1901-1978

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## **Abstract**

The design of many public buildings poses significant barriers to the full and equal participation of all members of society. Building users have valuable experiential knowledge of barriers to accessibility through their interactions with buildings, though this is frequently overlooked by professionals. A literature review highlighted the limited success of professionals in promoting universal design in buildings. The review also revealed an approach to engaging with building users which offered an alternative strategy worthy of further exploration. Lack of collaboration with building users to analyse public buildings according to universal design principles was identified as a research gap. The research question guiding this study was: how can users influence the universal design of public buildings?

Seven diverse participants were purposively recruited as co-researchers from a range of advocacy organisations. The co-researchers came together for a series of six meetings based on the search conference method, which involves creating a shared history and future vision, identifying and prioritising action plans for addressing the problem, and initiating change activities. In addition to the search conference, the co-researchers assessed a public library using a universal design assessment tool as a means of experiential learning of the universal design principles.

The action research process points to three mechanisms by which building users may be able to influence the universal design of public buildings: by forming a group, by using a formal assessment tool and by presenting their views. Forming a group enabled the co-researchers to broaden their perspectives and share their knowledge, skills, networks and resources amongst the group. The universal design assessment tool enhanced the co-researchers' learning of the universal design principles and equipped them to assess universal design. By presenting their views the co-researchers gained access to new networks, reflected on ways of influencing change and reflected on how change in governance impacts on community participation. This study empowered users of public buildings to assess environmental barriers using universal design principles and to promote positive social change to enhance community participation.

The primary limitations of this study involve recruitment. There were a small number of community advocates as co-researchers, which means that the findings of this study cannot be generalised to other groups, nor the other stakeholders that may influence or

benefit from universal design in public buildings. Further research is warranted to investigate how the wider stakeholders involved in the design of public buildings may influence their universal design now and into the future.

## Key to Presentation of Data

The following conventions and abbreviations have been applied to the presentation of data from the co-researchers in these research findings. Examples of the format used are provided.

- Names: Names used within this thesis are either the co-researchers' own first names or pseudonyms, according to each co-researcher's preference. Excerpts from the meetings are identified by the meeting number and the page of the transcription that is being referenced.
- I just want to say that I think that I've already learnt some more about other people and the challenges that they might face, day-to-day things, things that I hadn't thought of, and that's always a nice thing to come away with.*  
*(Isis, meeting 1, p. 40)*
- Italics: Where direct participant quotes are included, the co-researcher's words are italicised.
- Not being able to go out in the community is like having a day with no sun.* (Shirley, January 11, 2011)
- [Square brackets]: Indicate words inserted for clarity of meaning.
- I have a friend in a wheelchair and I know that she has difficulty moving around [shelving]. Either she's in the way of other people or she can't reach certain things.* (Carol, meeting 5, p. 3)
- ... Ellipsis: This indicates that material has been omitted from the meeting transcript.
- We were co-researchers, you didn't just consult with us... we had to do some of the drafting of submissions and things like that, so I think people took more ownership of the process.* (Martine, meeting 6, p. 28)

# **Chapter One – Introduction**

*Not being able to go out in the community is like having a day with no sun.*

(Shirley, January 11, 2011)

## **Introduction**

The design of public buildings and spaces poses significant environmental barriers to participation for a wide range of users. One approach to reducing those barriers is universal design – designing environments to be usable by all people to the greatest extent possible (Mace, 1985). Universal design is about more than the removal of barriers for people with disabilities. It creates the possibility of a better quality of life for a wide range of individuals that encounter disabling environments and would benefit from universal design in public buildings (Levine, 2003; Steinfeld & Maisel, 2012).

This small-scale action research study trialled a process of bringing members of the public together to collaboratively develop action plans to enhance community participation through universal design in the New Zealand context. For participants to learn to implement universal design principles (Connell et al., 1997), I planned a series of experiential learning activities including an assessment of a public building according to universal design. This is congruent with a definition of universal design as “a process that enables and empowers a diverse population by improving human performance, health and wellness, and social participation” (Steinfeld & Maisel, 2012, p. 29). The research question guiding this study was: how can users influence the universal design of public buildings? This study contributes to the ongoing refinement of the universal design principles and how they can be implemented to effect social change.

The literature highlights the diverse range of people that face disabling barriers in the built environment, including older adults, caregivers for people who are dependent, parents with prams, pregnant women, children, those that do not have a standard morphology, foreign visitors to a country, and people with temporary or permanent impairment (Chard & Couch, 1998; Goldsmith, 2000; Kaufman-Scarborough, 2001; Levine, 2003; Ormerod & Newton, 2005; Steinfeld & Maisel, 2012; Ware & Cavanagh, 1992). Universal design is based on the social model of disability (Heckel, 2003; Saito, 2006) which locates disability in the interaction between the person and the environment, with disability being socially constructed given the environmental barriers (Gossett, Mirza, Barnds, & Feidt, 2009). Universal design extends this idea by

analysing the interactions of all people with features of the environment that could disable them.

There are three main drivers for universal design: the social disability movement, changing demographics, and legislation (Gossett, et al., 2009; Saito, 2006). The social disability movement advocates for equal opportunity for participation for all citizens, emphasising that “separate is not equal” (Ostroff, 2011). Changing demographics, including the worldwide trend of an ageing population, has provided an impetus for designing products for a wider range of users (Steinfeld & Maisel, 2012), and is now having significant effects on the design of public buildings. While legislation is acknowledged as an initial driver of greater accessibility in public buildings, the premise of universal design is that the environment can be made more accessible and usable than can be realistically mandated by laws (Steinfeld & Maisel).

### ***Introduction to the study methodology and methods***

To explore how users can influence the universal design of public buildings, pragmatic action research was chosen as the methodology. This contemporary formulation of action research is based on the work of Kurt Lewin (Greenwood & Levin, 2007; Lewin, 1946) who utilised scientific inquiry to critically address social problems (DePoy & Gitlin, 2005). Lewin’s action research cycle involves planning, action, and reflection. It underpins pragmatic action research, which has an emphasis on challenging positivist techniques and production of knowledge. In pragmatic action research, the researcher can bring a specific problem to a group of recruited individuals to develop a shared future vision and action plans (Greenwood & Levin).

The study design followed a modified version of the search conference method (Greenwood & Levin, 2007; Rehm, Cebula, Ryan, & Large, 2002), with a series of six search conference meetings conducted over a period of four months from February to May 2012. This method involves five central steps: creating a shared history amongst the participants, sharing a vision of a desirable future, identifying actions, choosing amongst the action plans, and initiating concrete change activities. The transcripts of these search conference meetings were the primary source of qualitative data and were analysed inductively using thematic analysis and NVivo software. Deweyan theories on pragmatism, democracy, learning, and situation were used to guide the creation of the themes. The seven participants in this study also engaged in specific learning activities about the principles of universal design and independently assessed a public building using a universal design tool, adapted from Afacan and Erbug’s (2009) Task Scenarios.

Quantitative data analysis of the co-researchers' assessments was completed prior to the fifth search conference meeting to enhance the experiential learning of the universal design principles.

### **Context of this Study**

In recent international research studies, physical barriers in public spaces were identified as one of the leading causes of limited participation in the community (Stark, Hollingsworth, Morgan, Chang & Gray, 2008; Thapar et al., 2004). Emphasising the scale of the problem, Stark et al. reported that 5.3 million Americans reported difficulty going outside of the home or moving about in the community in 2005.

Research in universal design is both important and urgent in the New Zealand context. New Zealand society desires inclusion and at the same time reflects the worldwide trend of an ageing population, meaning that public buildings need to be designed for the diverse range of abilities and characteristics of the population now and into the future. The New Zealand context will first be discussed, followed by an overview of the rapidly changing environment of Auckland, the city where this study was situated. Finally my professional context is presented, outlining my interest in this research area.

### ***New Zealand context***

New Zealand signalled its desire to become an inclusive society by ratifying the United Nations (UN) Convention on the Rights of Persons with Disabilities (CRPD; UN, 2006) on September 26, 2008. This convention advocates for full participation and inclusion of people with disabilities in society and for signatories of the convention to undertake or promote research and development of universally designed facilities. In New Zealand, the Human Rights Act (Human Rights Act, 1993) prohibits discrimination on the grounds of sex (including pregnancy), age or disability (including physical disability or impairment), physical illness, psychiatric illness, intellectual or psychological disability or impairment, or reliance on a guide dog, wheelchair or other remedial means. In September 2011 a Commissioner was appointed with responsibility for disability issues, which enhances the New Zealand Human Rights Commission's (NZHRC) ability to promote the UNCRPD (NZHRC, 2012a). The premise of universal design is that the environment is designed to meet all users' needs, eliminating stigma and discriminatory design.

In its Human Rights Review in 2010, the NZHRC reported that inaccessibility of the built environment and public transport has been a longstanding and significant barrier to

employment for disabled people (NZHRC, 2010). As in the New Zealand Disability Strategy (Ministry of Health, 2001), the term disabled people is used, as “disability is in society, not in me” (p.9). In 2011 the Commission completed a programme of significant engagement into the issues of disabled New Zealanders including a hui<sup>1</sup> on a marae<sup>2</sup> to debate disability rights in a Te Ao Māori<sup>3</sup> context, a panel discussion on disability rights in Pasifika cultures, and forums to discuss issues facing refugees with disabilities (NZHRC, 2012a). One of the most frequent themes brought up by the participants was lack of accessibility to the built environment (NZHRC, 2012b). In 2012, the NZHRC produced a draft discussion paper on the subject, “The Wider Journey: The Rights of Disabled People” (NZHRC, 2012c). The paper aimed to provide information about accessibility and invite feedback on issues in three areas: the built environment, access to information, and independent voting. With respect to the built environment, the paper called for the promotion of universal design to “shift away from the practice of removing barriers for disabled people, and towards a practice of meeting the environmental needs of all users, regardless of age or ability” (NZHRC, 2012b). “The Wider Journey” is part of the Commission’s work to inform government of its responsibilities under the UNCRPD and forms part of the Commission’s independent report to the United Nations (NZHRC, 2012c).

In New Zealand, universal design is currently acknowledged within some areas of government including the Department of Building and Housing (Ministry of Business Innovation & Employment, 2008; Smarter Homes, 2011) and the Office for Disability Issues (Ministry of Social Development, n.d.). However, awareness of the philosophy does not yet appear to be widespread, as evidenced through online searching in government department websites and reports. Within many non-governmental organisations, however, universal design is promoted, including Age Concern (2012), the Barrier Free New Zealand Trust NZ (2011), Be. Accessible (n.d.-b), Lifemark (2012), the New Zealand Association of Occupational Therapists (Wood, 2007), and the New Zealand Historic Places Trust (NZHPT, 2011).

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<sup>1</sup> A Māori word meaning a meeting of any kind, conference, gathering (New Zealand History online Nga korero a ipurangi o Aotearoa, n.d.).

<sup>2</sup> The area for formal discourse in front of a traditional Māori meeting house or applied to a whole marae complex, including the meeting house, dining hall, forecourt, etc. (New Zealand History online Nga korero a ipurangi o Aotearoa, n.d.).

<sup>3</sup> Te Ao Māori denotes the Māori world. Te Ao Māori refers to three key areas: Te Reo Māori (Māori language), tikanga Māori (protocols and customs) and Te Tiriti o Waitangi (the Treaty of Waitangi). Together these areas provide a broad overview and an understanding of Māori culture and Māori realities (University of Otago, 2010).

Universal design is a new concept in New Zealand. While the Barrier Free NZ Trust now promotes the concept, when I completed the Barrier Free Trust training in 2005, universal design was not mentioned. While Be. Accessible promotes accessibility for all, this is a very new organisation, founded in 2011, and in 2012 did not explicitly allude to either universal design on its website (Be. Accessible, n.d.-b).

The ageing population is considered to be a significant driver of universal design, with the transition to an older age structure seen as a consequence of low mortality and low fertility (Statistics New Zealand Tatauranga Aotearoa [SNZ], 2009). The number of people in New Zealand who are over 65 is projected to increase from half a million in 2005 to 1.33 million by 2051 (SNZ, 2006), making up approximately 27% of the population (SNZ, 2006). The number of people aged over 65 in the New Zealand labour force is projected to treble from an estimated 38,000 in 2001 to 118,000 in 2026 (SNZ, 2006). In New Zealand there is not a specified mandatory retirement age (Ministry of Business Innovation & Employment, n.d.) and, as people live longer, they are more likely to want to continue to participate in employment (Saito, 2006).

The overall number and percentage of the population with a disability is also expected to rise, along with age-related functional limitations, such as declining vision and loss of mobility (Huss Pace, 2006), which impact on people's ability to access and participate in meaningful activities in the built environment. As the population ages, rates of disability increase dramatically, with 45% of adults over the age of 65 in New Zealand having a disability (SNZ, 2007). New Zealand also has a significant number of people with temporary disability, with an average 34–39% of New Zealanders experiencing an injury annually that results in a claim lodged with the Accident Compensation Corporation (ACC, 2011).

As stated previously, many other people benefit from universal design in public buildings, including parents with prams, those with non-standard morphology, and foreign visitors. With respect to parents managing the built environment with prams, technologies such as in vitro fertilisation and advanced neonatal intensive care, as well as the rising age of maternity, are correlated with an increase in multiple births (Bewley, Ledger, & Nikolaou, 2009). Multiple prams have larger dimensions and people using them encounter significant difficulties in accessing buildings with narrow doorways and limited circulation spaces. In terms of non-standard morphology, height and weight have been increasing since the eighteenth century, as income, education, and living conditions have improved over time (Sassi & Devaux, 2012). Obesity is rising rapidly,

with New Zealand being the third most obese out of 34 Organisation for Economic Co-operation and Development (OECD) countries. Some projections are that as many as two out of three people could be overweight or obese by 2020 (Sassi & Devaux). As the range of diversity of morphology continues to expand, more people will face challenges in public buildings. Lastly, in terms of foreign visitors, New Zealand received over 2.6 million international visitors in 2011 (SNZ, 2012b). Foreign visitors or recent immigrants to a country have culturally based traditions, expectations, preferences, and languages that are different from the host country (Steinfeld & Maisel, 2012). They benefit from universal design features such as signage which is pictorial as well as written, design features which are simple and intuitive to use, and assistive wayfinding elements. Therefore, there is significant pressure on the design of public buildings to be able to accommodate an increasingly diverse range of people.

### ***Auckland context***

This study was situated in Auckland, the largest city in New Zealand, with a population of 1.5 million and growing (SNZ, 2012a). At the time of this study, Auckland was in a state of considerable transition. In March 2009, the Royal Commission on Auckland's local government released its report and the Minister of Local Government agreed with the recommendation to merge the seven councils – Auckland City Council, Auckland Regional Council, Franklin District Council, North Shore City Council, Rodney District Council, Manukau City Council, and Waitakere City Council – into one 'supercity' with a single governing council, the Auckland Council (Auckland Council Te Kaunihera O Tāmaki Makaurau, n.d.). Some saw this as a distinctive opportunity for political change. The Auckland Council appears to be aiming for greater accessibility with a vision statement of becoming "the world's most liveable city" (Auckland Council Te Kaunihera O Tāmaki Makaurau, 2012a). Universal design could support this goal; however, there is considerable risk that it will not be fully realised due to the potential for a decrease in democratic processes. Ian Shirley, an Auckland Professor of Public Policy, saw the move to a supercity as the demolition of local government in Auckland: "It ignores history, fails to connect in any meaningful way with the diverse populations and neighbourhoods of the region and has established a corporate framework and process that will not gain the trust of ratepayers" (Shirley, 2010, p. 7). The amalgamation policy could be said to reduce democracy to tokenism in the decision-making systems of local government.

Research in this area is very important. Neelu Memon, the first blind athlete to complete the New Zealand Coast to Coast endurance race, stated, “If our whole population cannot use the city to its potential, they cannot achieve to their potential” (Memon, 2012). Central to this study is the importance of people’s human rights and access to meaningful occupations in their communities in order to be able to participate as engaged citizens.

### ***Professional context***

This study stems from my professional experience as an occupational therapist facilitating housing modifications for people with long-term illness or disabilities. While I greatly valued this role, my work often felt unfinished. In my work I enabled people to be independent within their own homes. However, in looking beyond the home, I was continually confronted with the fact that the built environment poses significant challenges for the clients I worked with to access public buildings and places in order to participate in the things they wanted or needed to do. Participation is being involved and engaged in society, socially interacting with other people and the physical environment (Vessby & Kjellberg, 2010). Participation is linked to the idea of citizenship, which is about being a member of a community and having the right to contribute to and enjoy the benefits of society (Merriam-Webster, 2012). People who are not accepted as citizens or members of a community may be viewed as different and deficient; therefore, to promote citizenship is to encourage society to value diversity (Christiansen & Townsend, 2004). While some occupational therapists contend that participation in meaningful activities outside of the home is important for quality of life (Fänge, Iwarsson, & Persson, 2002; Fricke & Unsworth, 2001), there is a lack of occupational therapy research on physical environmental issues at a societal level (Ivanoff, Iwarsson, & Sonn, 2006).

### **Structure of the Thesis**

This thesis is presented in seven chapters. Chapter One provided an outline, rationale and context for this research study. The pragmatic action research methodology and search conference method of this study were introduced.

In Chapter Two, the study is located within the existing knowledge base, with further analysis and critique of the existing literature on universal design in public buildings. This chapter is organised according to five main themes that emerged from the literature review: facilitators and barriers to universal design implementation, legislation, assessments, and participatory research.

Chapter Three provides a discussion of the pragmatic action research methodology upon which this study was based. The philosophical basis of pragmatic action research in the work of John Dewey is briefly outlined. Deweyan concepts of democracy, learning, and situation are introduced which are later used to interpret the findings of this study.

Chapters Four and Five detail the methods of this study. The planning for this study is provided in Chapter Four. The selection of data gathering methods is discussed. The chapter details how rigour has been established throughout this study and ethical research practices have been maintained. The pre-planning for the search conference is detailed.

Chapter Five presents an account of how the research method of the search conference was enacted. Action research cycles of planning, action, and reflection depict what occurred over the three-month duration of the search conference. The methods for data analysis are described and an audit trail is provided.

The findings of this study are presented in Chapter Six. The findings reveal three main ways users can influence the universal design of public buildings: by forming a group, by using a formal assessment tool, and by presenting their views.

Chapter Seven provides a discussion of the findings, using Deweyan concepts of democracy, experiential learning, and habit to add depth and meaning to each of the emergent themes. An overall summary integrates the study's findings, detailing the implications for universal design assessment of buildings and participatory design processes. Strengths and limitations of this study are discussed and suggestions are made with respect to future research and practice in this area.

## Chapter Two – Literature Review

*I want a social life mixed up with other people...*

*I don't want my impairment to stand out or get in the way.*

(Focus group participant, Imrie & Kumar, 1998, p. 371)

In this chapter the research study is located within the existing knowledge base. This chapter analyses and critiques the existing literature on universal design in public buildings. The discussion is organised according to the five main themes that emerged from the literature review: facilitators and barriers to universal design implementation, legislation, assessments, and participatory research. Drawing on this literature review, gaps in current knowledge are highlighted.

The aim of reviewing the literature for this study was to ascertain factors affecting the implementation of universal design in public buildings within the cross-disciplinary research. Aveyard's (2007) methodological outline and Creek and Hughes' (2008) review method provided the framework for this review. It was completed in five stages: exploration of how universal and inclusive design have been defined in the literature, selection of keywords for the database search, selection of relevant literature, quality assessment, and data extraction and analysis.

### **Stage 1: Exploration of How Universal and Inclusive Design Have Been Defined in the Literature**

To provide a conceptual background to the study, accessibility and barrier-free design are briefly explored, as these terms preceded the development of the concept of universal design. Accessibility, defined as the “ability to enter, approach, or pass to and from a place” (Merriam-Webster, 2013), is an umbrella term for all parameters that influence human functioning in the environment. Accessibility is based on norms, standards, and official guidelines, many of which are based on opinion rather than research (Iwarsson & Ståhl, 2003). Understandings of accessibility, therefore, vary internationally and over time, perhaps representing prevailing societal ambitions (Iwarsson & Ståhl; Preiser & Ostroff, 2001; Saito, 2006). For instance, physical access to public services and facilities was a focus of early efforts of the disability movement (Heckel, 2003) as symbolised by the stylised image of a person using a wheelchair as the international symbol of accessibility (International Organization for Standardization, 2007). Recent critique of viewing access issues from a physical disability perspective, is that in thus privileging mobility difficulties (Heckel; Ormerod & Newton, 2005),

awareness of sensory, intellectual, and other disabilities is minimised (Goldsmith, 2000; Thapar, et al., 2004).

In the 1970s, increasing public visibility of disabled people galvanised the disability movement to lobby for the removal of physical, sensory, and cognitive architectural barriers (Heckel, 2003). Despite the broader scope of ‘barrier-free design’, however, the focus has largely remained on physical architectural barriers (Ringaert, 2003).

Additionally, barrier-free design has been critiqued because it remains closely related to the needs of older adults (Heckel) and people with disabilities (Iwarsson & Ståhl, 2003; Steinfeld, 2008), irrespective of the barriers experienced by other groups.

In 1985, the term universal design was first used in the United States by Ronald Mace, although forms of it were prevalent in Europe before that time (D'Souza, 2004).

Universal design is frequently defined as “the design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialised design” (Mace, 1985). It appears that the term universal design is widely used in North America, while the term inclusive design or ‘design for all’ is often used in Europe (Heylighen, 2008; Iwarsson & Ståhl, 2003; Nussbaumer, 2012). These terms are often used synonymously (Gossett, et al., 2009). There is noted to be considerable overlap between universal and inclusive design. However, debate continues within the literature on whether the term universal design or inclusive design is ‘best’ and this is likely to continue into the future (Nussbaumer). For the purposes of this thesis, the term universal design will be employed as the primary nomenclature.

The focus has moved from access for those with physical impairments and labelling them as having special needs to design for all, where no one is singled out through specialised design. Universal design can be seen as a paradigm shift away from standardisation towards maximising flexibility and adaptability (Saito, 2006). Universal design has the underlying belief that “there is only one population, comprised of individuals representing diverse characteristics and abilities” (Iwarsson & Ståhl, 2003, p. 61) and that inclusive design features benefit as many people within society as possible (Chard & Couch, 1998). It is a move from looking at the abilities of more than one target user group to designing for age, physical size, as well as functional limitation (Heckel, 2003). Universal design sees the user as the best source of information and stresses the importance of knowing about people’s functional needs and understanding how people can be excluded by design as well as included (Millar & Oliveck, 2003).

Universal design practitioners consider the design process to be as significant as the end result (Gossett, et al., 2009; Iwarsson & Ståhl; Salmen, 2008).

Proponents of both universal design and inclusive design have published principles to guide the design process and to educate designers and consumers about the characteristics of more usable products and environments (Commission for Architecture and the Built Environment, 2006; Connell, et al., 1997). Refer to Table 1 below for the Principles of Universal Design.

Table 1

*The principles of universal design* (Connell, et al., 1997)

Principle	Description
<b>1. Equitable use</b>	The design is useful and marketable to people with diverse abilities.
<b>2. Flexibility in use</b>	The design accommodates a wide range of individual preferences and abilities.
<b>3. Simple and intuitive use</b>	Use of the design is easy to understand, regardless of the user's experience, knowledge, language skills, or current concentration level.
<b>4. Perceptible information</b>	The design communicates necessary information effectively to the user, regardless of ambient conditions or the user's sensory abilities.
<b>5. Tolerance for error</b>	The design minimises hazards and the adverse consequences of accidental or unintended actions.
<b>6. Low physical effort</b>	The design can be used efficiently and comfortably and with a minimum of fatigue.
<b>7. Size and space for approach and use</b>	Appropriate size and space is provided for approach, reach, manipulation, and use regardless of user's body size, posture, or mobility.

Refer to Appendix A for the Principles of Inclusive Design. Most practitioners and researchers acknowledge the seven universal design principles as useful guidelines in the application of this philosophy (Afacan & Erbug, 2009; Gossett, et al., 2009; Gradziel, 2007; Heckel, 2003; Huss Pace, 2006; Iwarsson & Ståhl, 2003; Saito, 2006).

## **Stage 2: Selection of Keywords for the Database Search**

A list of keywords relevant to the aim of the review was composed; refer to Table 2. It soon became apparent from preliminary database searching that public building was too restrictive, so the term building was used to capture the wider range of buildings that universal design practitioners may be researching.

Table 2

*Keywords and Associated Terms in the Database Search*

Keywords	Associated terms
Universal design	Accessibility Approachability Barrier-free design Flexibility Sustainability Universal usability Usability
Inclusive design	Adaptability Assistive technology Design for all Desirability Functional Viability Visitability
Occupational therap*	Occupational therapy Occupational therapist
Building*	Buildings Public buildings

*Note.* Refer to Appendix B for a glossary of selected terms.

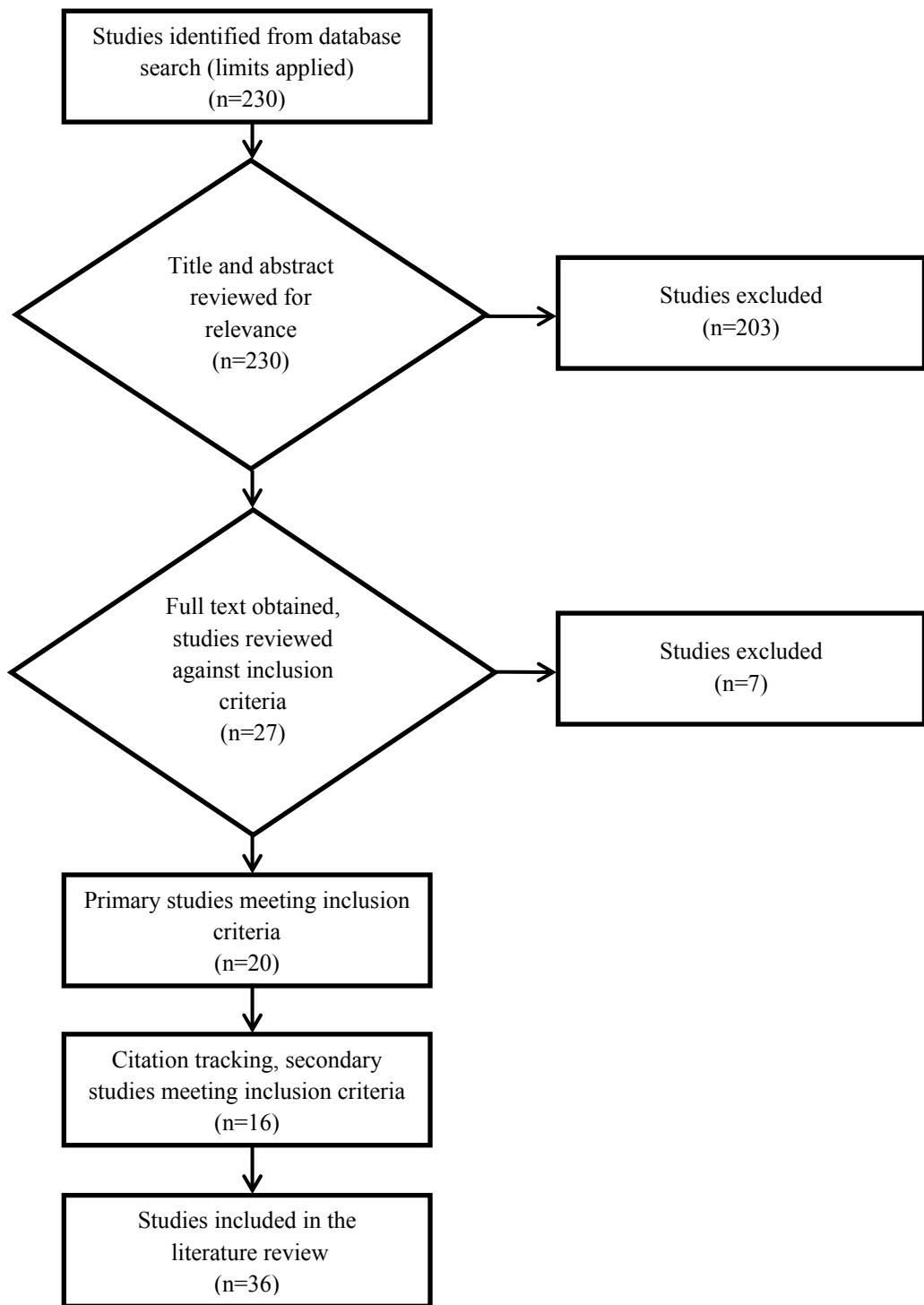
### **Stage 3: Selection of Relevant Literature**

The database search was conducted using the following bibliographic databases: Academic Search Premier, Australasian Digital Theses, CINAHL, Expanded Academic, Medline, OT Seeker, PsychINFO, ProQuest Dissertations and Theses, Scopus, as well as Google Scholar. The database search was executed using the keywords and phrases as well as Boolean operators to ensure broadness of the search (Hoffman, Bennett, & Del Mar, 2010). Multiple searches were completed within each database, structured as universal design AND building\*, inclusive design AND building\*, universal design AND occupational therap\*, and inclusive design AND occupational therap\*. Results were limited to articles published between 1985 and 2010 and available in English and in full text, with efforts made to secure full text when initially only abstracts were available. To attain saturation, citation tracking was employed, i.e. the reference lists of all of the selected articles were reviewed for potential additional articles.

#### ***Results of the electronic search***

From the electronic search, a total of 230 abstracts were retrieved and screened for relevance to the inclusion criteria and aim of the review. From these, 27 were considered potentially relevant. The full-text versions of these studies were obtained and

re-assessed against the inclusion criteria, studies that focussed on accessibility and universal design in public buildings. The reason for this focus is that there is an existing body of evidence in the area of occupational therapy promoting universal design in private housing (Iwarsson, 1999), while the role of occupational therapy in promoting universal design in public buildings is emergent. From the first 230, 20 were included in this literature review as primary studies. Citation tracking was completed on these primary studies, with a further 16 studies meeting inclusion criteria. A total of 36 articles met inclusion criteria. Both qualitative and quantitative research was included in this review. Refer to Figure 1 for a depiction of the selection process.



*Figure 1.* The selection process for included studies

Studies that primarily concerned outdoor environments, travel and/or transportation, education and information technology were excluded from the literature review because the significant legislative differences governing these areas have given rise to differing strategies for advocating for universal design in those realms compared to the built environment (Steinfeld & Maisel, 2012). Private housing was also excluded as there are differences in participation in occupations within and outside of the home.

“Participation in social activities outside home, chosen through interest and not only

through accessibility considerations is a fundamental part in most individuals' lives, of importance for life satisfaction" (Fänge, et al., 2002, p. 318). In contrast, participation in activities outside of the home is considered essential (Fricke & Unsworth, 2001; Huss Pace, 2006) and when denied access, social and economic opportunities are limited (Useh, Moyo, & Munyonga, 2001).

#### **Stage 4: Quality Assessment**

Each of the 20 primary and 16 secondary research articles were assessed with the aim of identifying factors affecting the implementation of universal design. The following information was obtained from each study: author(s), year of publication, the primary purpose of the study, country(ies) where the study was based, discipline(s) involved in the study, study design, sample size, main findings, and strengths/limitations of the study. Refer to Appendix C – Characteristics of Included Studies.

In this literature review, the McMaster University Critical Review Forms – Quantitative Studies (Law et al., 1998a) and Qualitative Studies (Version 2.0) (Letts et al., 2007a) were employed. The associated guidelines were referred to when completing the critical review forms (Law et al., 1998b; Letts et al., 2007b). The Critical Appraisal Skills Programme (CASP) was used to assist with the critique of an economic analysis (CASP UK, 2006a) and a literature review (CASP UK, 2006b).

While a scoring system is advocated by some authors (CASP UK, 2006b; Taylor, 2007), in order to provide a comparative table on rigour for the reader to easily decipher, this was not completed in this literature review for methodological reasons. For example, existing scoring of research articles such as the Physiotherapy Evidence Database (PEDro) (Verhagen et al., 1998) has been designed primarily for randomised control trials, and does not suit application to all of the types of studies included in this review – cross-sectional studies, case studies, qualitative studies and non-systematic literature reviews. CASP forms were not designed to be scored (CASP UK, 2006b), and providing an overall score can lead to a false assumption of rigour without the subsequent analysis that supports it.

#### **Stage 5: Data Extraction**

The aim of the literature review was to analyse factors affecting implementation of universal design in public buildings within the cross-disciplinary research. Thematic analysis of the included literature was completed. Key themes of each article were charted twice using a spread sheet. The initial analysis provided the scope of the ideas

discussed and preliminary headings such as economic impacts, participatory design, and concept definition. In the second analysis, completed alongside the quality assessments, the themes were grouped and refined according to their similarity and prevalence within the literature. The five main themes extracted from the literature review were facilitators to universal design implementation, barriers to implementation, legislation, universal design assessments, and participatory research.

### ***Facilitators to universal design implementation***

The documented factors which facilitate implementation of universal design in public buildings included increased marketing opportunities, improved participation, learning from personal experience, increased use of interdisciplinary approaches to solve design issues, and improved aesthetics. Improving participation is seen as both an aim and outcome of universal design (World Health Organization, 2002).

### ***Marketing***

Several authors contend that universal design should improve corporate image, but these claims have not yet been empirically substantiated. In one study in 1986, facility owners were offered an incentive of improved marketing through both media publicity as well as an improved accessibility rating in an access guide produced in the state of Kansas (Nelson et al., 1986). However, it is not directly reported how successful this type of incentive was. Conversely, in Chard and Couch's (1998) study, publishing results of accessibility of university buildings on the internet was considered bad publicity by some of the university staff. This may be due to the buildings having significant accessibility issues at the time they were audited.

More recently, commercial benefits have been reported from employing universal design principles (Ormerod & Newton, 2005). For example, one moderate-size quantitative study (153 participants) reported increased attendance in North American museums (Tokar, 2004). Improved accessibility of retail stores in Sweden would reportedly attract customers who would otherwise have made their purchases elsewhere (Iwarsson et al., 2004). In Japan, the popularity of the concept of universal design stems from the field of product design, where the power of markets has been utilised to promote cheaper, common and attractive products (Saito, 2006). Manufacturers and advertising agencies have thus utilised universal design as a new marketing strategy to enhance corporate image, resulting in a competitive advantage (Saito). Universal design is reported to increase both market share and profitability (Heckel, 2003). Marketing to older adults in particular is gaining attention as they are recognised as having substantial

financial means (Huss Pace, 2006); their purchasing power will increase as this population grows exponentially.

### *Participation*

Improved participation in the community is a clear aim and outcome of the use of universal design in public buildings. Universal design has been proposed as an intervention to overcome participation restrictions (World Health Organization, 2002), a moral imperative or the ‘right thing to do’ (Heckel, 2003; Ormerod & Newton, 2005). Universal design has been reported to improve economic opportunities through employment, enable activities of daily living such as shopping, and improve social connections through community integration. This is reported in the literature by universal design practitioners, facility owners and the users of public buildings (Kaufman-Scarborough, 2001; Huss Pace, 2006; Saito, 2006; Tokar, 2004).

There is some evidence that increased employment opportunities can be an outcome of universal design principles in public facilities. A moderate-size survey of facility managers in the United States (128) and Japan (62) found that universal design allowed greater flexibility in the employment of diverse workers (Saito, 2006). Keeping older workers in the workforce for a longer period is seen as one of the beneficial outcomes of universal design (Saito). This is particularly important with the ageing population, for example the population in Japan over 65 doubled from 1970 to 1994 (Kose, 2011) and in the United States the population over 65 has increased 107% since 1960 (Steinfeld & Maisel, 2012). A lack of accessibility can, however, negate equal opportunity. In a moderate-size qualitative study (30 participants) in the United Kingdom, one participant argued, “Many of us can’t get into work places and employers will use that as an excuse not to give us a job” (Imrie & Kumar, 1998, p. 371).

Similarly, enhanced community involvement and social participation was the biggest perceived benefit of applying universal design principles in a study on museums (153 participants) (Tokar, 2004) and in two small qualitative studies of retail spaces (Kaufman-Scarborough, 2001). For ageing customers, universal design enabled them to continue their participation in retail environments (Huss Pace, 2006). These outcomes are important because opportunities for integration are desired: “I want a social life mixed up with other people...I don’t want my impairment to stand out or get in the way” (Imrie & Kumar, 1998, p. 371).

### *Learning from personal experience*

Direct experience of functional limitations, first-hand or directly observed, supports universal design implementation in public buildings. Architects in the United Kingdom and building owners in Sweden used personal experience of disability as a predominant influence in understanding disability issues and planning for accessibility in public buildings (Iwarsson, et al., 2004; Ormerod & Newton, 2005). Simulating a disability may also assist in gaining useful insights of the barriers faced in public buildings.

Marketing students who simulated a mobility impairment in a small qualitative study reported a deeper understanding of the extra demands placed upon disabled shoppers (Kaufman-Scarborough, 2001). A participant in Imrie and Kumar's (1998) research appeared to support this approach, stating "I think all professions should actually spend some time in a wheelchair" to find out what the experience is like (p. 369). This practice, however, is controversial within the disability community. Simulation activities may fail to simulate the impairment correctly and ignore the strategies and skills that disabled people have developed through living with their impairments, and do not take into account the psychological effects that attitudinal and physical barriers can have over a lifetime (French, 1992).

### *Interdisciplinary approaches*

Interdisciplinary design and collaboration has been found to increase usability outcomes and promote universal design (Afacan & Erbug, 2009; Gossett, et al., 2009), with design teams producing results beyond those achieved by any single contributing discipline (Heylighen, 2008). In one mixed-method study, the rate of uncovering problems of a building's design in relation to the universal design principles was increased by using two interior architects, two architects and an urban planner (Afacan & Erbug). The inclusion of disabled people in design teams alongside architects and access officers has been specifically recommended to promote inclusive environments (Chard & Couch, 1998). While these results support interdisciplinary approaches, the specific or potential composition of these teams has not yet been fully explored.

### *Aesthetics*

While aesthetics is desired in universal design, the literature does not state how to achieve this as users and design professionals have different preferences on what is aesthetically pleasing. Providing access via back doors of public buildings or freight elevators is considered to be unequal and insulting; it is important that accessibility features be both convenient as well as palatable to the consumer (Fänge, et al., 2002;

Martin, 1987). Universal design can effectively integrate function, accessibility and aesthetics (Heckel, 2003; Huss Pace, 2006). Well-designed buildings are discussed and admired; an architect dedicated to universal design is encouraged to maintain an aesthetically impressive form (Heckel). However, half of the building users interviewed in a small qualitative study (6 participants) preferred that a universally designed building be traditionally styled. One participant stated that a building's "appearance shouldn't be too outlandish. The design fires others to realise that accessible design is not out of the ordinary and is achievable" (Luck, 2003, p. 533).

Spatial organisation was found to contribute to aesthetics. Participants in one moderate-size quantitative study (127 participants) routinely chose photographs of retail environments that depicted spaciousness, including wide clear aisles without clutter, reporting that this facilitated looking at merchandise and provided easy access (Huss Pace, 2006). In contrast, a respondent in Luck's (2003) research stated that people with visual impairment may prefer smaller spaces over wide-open ones in a public building.

### ***Barriers to universal design implementation***

The main barriers highlighted in the literature included attitudinal barriers and a lack of awareness of universal design. Perceived higher cost of construction, lack of designated responsibility for implementation, and difficulty achieving a solution that met the majority of needs were also identified.

#### *Attitudinal barriers*

Attitudinal barriers are frequently reported in the research, both attitudes that impede the adoption of universal design principles and attitudes that are in themselves barriers to access. Stigmatising attitudes towards disabled people are manifest (Iwarsson, et al., 2004) with a common perception that "accommodating people with disabilities is accomplished at the cost of disrupting non-disabled people" (Gossett, et al., 2009, p. 446), or that people with disabilities are a drain upon society (Heckel, 2003). Some architects in the United Kingdom stated that their clients perceive designing for the disabled as a 'necessary evil' rather than essential, and therefore, only minimum standards are employed (Ormerod & Newton, 2005).

Attitudes and reactions from others can be as substantial a barrier as physical environmental barriers (Imrie & Kumar, 1998). For example, in two small-scale qualitative studies involving both disabled and non-disabled shoppers, a general lack of communication with or avoidance of disabled shoppers was found (Kaufman-

Scarborough, 2001). Conversely, when inclusion is valued, physical barriers in the environment are less of an issue. For instance, one participant in a small qualitative study stated that “90% of the time, even when [public buildings] are not accessible, if the people who work there are cool and you are willing to deal with the hassle, you can do anything you want” (McClain, Cram, Wood, & Taylor, 1998, p. 40). Iwarsson and Ståhl (2003) advocated that universal design is about changing attitudes in society, emphasising democracy, equity and citizenship, though the process to accomplish this attitudinal shift has not yet been described in the research literature.

#### *Perceived costs/poor space usage*

One of the biggest barriers to universal design is the perceived negative cost-benefit ratio of making public spaces accessible (Heckel, 2003). Both remodelling existing public buildings and changing the plan during construction are acknowledged as being more expensive than including accessibility in the original design (Chard & Couch, 1998; Heckel; Ormerod & Newton, 2005; Saito, 2006). However, there is little explicit research that has been completed on this issue. Most facility managers perceived cost as the biggest barrier and poor space usage as a significant barrier to implementation of universal design (Saito; Tokar, 2004). Saito further stated that this is particularly challenging in Japan, where land prices are high.

In addition to potentially increased construction costs, a significant barrier to implementation of universal design was a lack of financial incentive to do so (Gossett, et al., 2009; Iwarsson, et al., 2004; Nelson, Jones, & Salkind, 1986). One suggestion to overcome this barrier is to provide an incentive with a system similar to Leadership in Energy and Environmental Design (LEED) Green Building Registration, which aims to increase the sustainability of public buildings (Gossett, et al.; Steinfeld & Maisel, 2012). This programme in the United States provides subsidies to those that pursue certification. A health economics study found that when public places are universally designed there is less need for expensive assistive technology to be individually provided for people with disabilities, resulting in significant cost savings for society as a whole (Schraner, de Jonge, Layton, Bringolf, & Molenda, 2008).

#### *Lack of knowledge/awareness of universal design*

There has been a documented lack of knowledge, awareness, education, and training regarding universal design for architects (Heylighen, 2008; Ormerod & Newton, 2005), facility managers, and owners (Saito, 2006; Tokar, 2004). A large survey of architects in the United Kingdom (961 participants) revealed that only 25% of respondents had

undertaken training in access issues and that for 95% of those respondents, it was only half a day in duration (Ormerod & Newton). Such figures may be an overestimation, as there is potential sample bias; the survey respondents belonged to the Royal Institute of British Architects (RIBA), which promotes inclusive design through continuing professional education and inclusive design awards (RIBA, 2009), and may not reflect architects in the United Kingdom as a whole. With respect to facility managers, Tokar (2004) found that less than half (47%) of small museums in North America were familiar with the term universal design. Lack of experience and knowledge was also reported by more than a third (37%) of American facility owners (Saito, 2006). Even when designers were aware of universal design, problems appeared in integrating the theories and guidelines into design practice (Afacan & Erbug, 2009). There are few methods proposed in the literature to overcome this. One is that trade journals should showcase instances of well-designed and aesthetic buildings to promote good examples of accessibility (Chard & Couch, 1998; Heckel, 2003). Documenting the process of translating the philosophy of universal design into a successful public building has also been reported as motivating research (Gossett, et al., 2009).

#### *Responsibility for implementation*

The understanding and commitment of top management is key to driving the universal design process (Ormerod & Newton, 2005; Saito, 2006). However, American facility owners stated that lack of understanding by executives was a major barrier in introducing universal design in the workplace (32% of respondents) (Saito). Some managers reported lacking the authority to improve accessibility (Nelson, et al., 1986) and facility managers were found to be significantly less likely to implement universal design if they occupied leased or part-leased facilities (Saito). This factor could have significant implications for the implementation of universal design in public buildings.

#### *No single solution*

When attempting to use universal design principles in public buildings, the perception that ‘no one solution fits all users’ is a significant barrier encountered (Gossett, et al., 2009). In the survey of museums, ‘can’t be all things to all people’ was the second-biggest perceived barrier to implementing universal design (Tokar, 2004). Cooper, Cohen and Hasselkus (1991) posed the question, “In the absence of a universal solution, whose needs should take precedence?” (p. 3). Creating environments that are universally designed is challenging and requires careful analysis of the many competing needs (Gossett, et al.). Close attention to detail is needed, not only to the prominent

exterior features, but also to the interior features of a building such as light, texture and pattern, as they have been found to have a significant impact on the usability of a building (Gossett, et al.; Iwarsson, et al., 2004).

### ***Legislation***

Legislation is reported to be a main driver of improved accessibility and is frequently discussed within the literature. Some authors contend that legislation is needed for universal design to be integrated into practice (Chard & Couch, 1998; Ostroff, 2001). While legislation differs between countries, as evidenced, for example, by the Americans with Disabilities Act (ADA, 1990) in the US, the Disability Discrimination Act (DDA, 1995) in the United Kingdom, and the Heartful Building Law (1994) in Japan, authors have frequently found a lack of knowledge regarding legislation and its implications for public building design (Imrie & Kumar, 1998; McClain, 2000; Ormerod & Newton, 2005; Saito, 2006). It has also been noted that legislation requires ongoing monitoring for compliance (Grabois, Nosek, & Rossi, 1999; McClain).

The ADA, while hailed as identifying accessibility as a civil right, is criticised as being difficult to interpret and enforce (Heckel, 2003). The DDA legislated that public buildings need to provide ‘reasonable’ access, but has been criticised for being vague (Imrie & Kumar, 1998; Ormerod & Newton, 2005). Architects and designers have been criticised for treating legislation as a maximum standard to be obtained (i.e. building down to something) rather than minimum standards to be achieved (i.e. building to the highest quality) (Heylighen, 2008; Imrie & Kumar; Saito, 2006).

Two countries were identified in this literature review as not having specific legislation regarding accessibility at the time the articles were written. Rivano-Fischer (2004) reported that United Arab Emirates had made significant progress in improving accessibility despite lack of legislation, while Iwarsson et al. (2004) argued that legislation was needed to improve accessibility in Sweden. While the majority of the authors agreed that legislation increases accessibility, with respect to universal design there is less consensus (Heckel, 2003; Steinfeld & Maisel, 2012).

### ***Participatory research***

Participatory design and participatory research are frequently advocated for in accessibility and universal design research literature (Chard & Couch, 1998; Gossett, et al., 2009; Heckel, 2003; Imrie & Kumar, 1998; Luck, 2003; Ormerod & Newton, 2005; Rattray, 2007; Stark, et al., 2008; Tokar, 2004; Useh, et al., 2001). While much has been

written about client-centred practice in occupational therapy literature, only a few studies have reported using participatory research involving users (Ivanoff, et al., 2006).

Discussions with users can reveal insights into their experience of an environment (Danford, 2003; Luck, 2003) with some authors advocating the use of ‘grassroots’ involvement in the building design (Gossett, et al., 2009). Building users were reported to have a valuable body of knowledge, built up through their interactions with buildings, with disabled users appreciating qualities and detecting problems that most architects are not aware of (Heylighen, 2008). However, professionals often overlook experiential sources of information during the design and planning stages (Imrie & Kumar, 1998). This assertion was supported by Ormerod and Newton’s (2005) large survey of architects, which found that although consultation with end users is an important element of the briefing process, architects in the United Kingdom (48% of respondents) do not frequently consult with disabled end users. Heylighen advocated for personnel and disabled people to be involved in the design or redesign of public buildings and to be interviewed about their spatial experiences and preferences. While some museums in North America consulted with advisors with disabilities, smaller museums were found to be far less likely to do so (Tokar, 2004).

The methodology and methods which proposed to use this knowledge included focus groups and action research. While a diverse participant group is needed for research in universal design, caution is advised against extrapolating individual user preferences to a broader population (Luck, 2003). People with the same disability may or may not share similar experiences or views on the design of public buildings. However, despite the repeated calls for participatory research, few examples were identified. While action research has been used to analyse barriers to accessibility for people who have had a stroke (Hammel, Jones, Gossett, & Morgan, 2006) and older adults (Ripat, Redmond, & Grabowecky, 2010), research involving a diverse group of co-researchers to examine public buildings according to the principles of universal design was not identified in the literature review for this study.

### ***Assessments***

The literature highlighted the importance of having objective, standardised measures for assessing the success of public building design, while also stating that such measures do not exist (Afacan & Erbug, 2009; Cooper, et al., 1991; Iwarsson, et al., 2004; McClain & Todd, 1990; Stark, et al., 2008). It can, however, be argued that concepts of ‘objectivity’ and ‘standardisation’ do not fit with the ethos of universal design, in which

the process is just as important as the end product (Salmen, 2008). As universal design strives to render products and buildings usable by everyone, usability is subjective to the end user. Another difficulty is that while authors advocate for user involvement in the universal design of public buildings, the measurement tools frequently assess the building as a separate entity from the user. An exception to this is Thapar et al.'s (2004) study, which utilised functional tasks in its assessment of public buildings. However, the tasks did not necessarily assess participation. For example a task in a cinema was to purchase a ticket, but not whether the participant could access the theatre, sit in a seat next to a friend and see and hear the film.

There are several universal design assessments that have been recently developed in relation to public buildings. Sequential heuristic evaluation was found to be an efficient method for evaluating how well the usability of a newly designed shopping mall conformed to universal design (Afacan & Erbug, 2009). The assessment tool developed and used in that study incorporated the seven universal design principles, which are considered useful guidelines by both practitioners and researchers (Afacan & Erbug; Gossett, et al., 2009; Huss Pace, 2006; Iwarsson & Ståhl, 2003; Saito, 2006). Another assessment, the Housing Enabler, demonstrated good inter-rater reliability and good content validity (Iwarsson, 1999; Iwarsson et al., 2005); a pilot study with the modified version for assessing public buildings (Iwarsson, et al., 2004) also demonstrated good inter-rater reliability. Huss Pace developed an assessment to detect preferences in retail environments based on the universal design principles, with participants stating their preference based on comparisons between black and white photographs. However, that assessment method may not fully represent user preferences in shopping environments where there are varied competing stimuli, including colour, noise, and crowds.

With respect to timing of universal design assessments, authors assert that this should be done at several points. Ormerod and Newton (2005) stated that access issues should be considered in the briefing process of a building design. If accessibility issues and code compliance are considered after the design is essentially complete, it may be too late to make significant changes (Heckel, 2003). When the building is completed a post-occupancy evaluation (POE) can be undertaken; however, these are underused in the research literature (Afacan & Erbug, 2009; Heylighen, 2008; Saito, 2006). Heylighen criticised that while more POEs are being completed, they are not being used as a standard tool in architecture and are often not conducted unless problems are identified

by the building users. This does not enable good designs or solutions to design problems to be recorded and reused.

To interpret the results of a building assessment, knowledge is needed on the prevalence of functional limitations or capabilities of different groups of people (Carlsson, Iwarsson, & Ståhl, 2002). As diagnosis is not seen to be a valid predictor of functional capacity, further research needs to be mindful not to make generalisations based on diagnosis. However, many existing surveys of disability do not reliably provide an indication or range of capabilities in the population, warranting further research in this area (Johnson, Clarkson, & Huppert, 2010).

Another shortcoming in relation to universal design implementation is that although providing feedback on assessment results is considered to be an effective way to promote change (Nelson, et al., 1986), it is not always apparent that this was completed (Martin, 1987; McClain et al., 1993; Rivano-Fischer, 2004; Thapar, et al., 2004; Useh, et al., 2001). Even when assessment results have been made available, follow-up by telephone is also problematic as it is not possible to assess whether the changes made by the building owners/managers have helped to improve accessibility, or have in fact introduced new barriers (Iwarsson, et al., 2004).

## **Summary**

While the term universal design was coined in 1985 and the principles were published in 1997, there is a significant gap in studies examining universal design in public buildings. Several strategies have been proposed for promoting improved accessibility and universal design of public buildings. Nelson et al. (1986) proposed informational prompts, feedback on existing performance, and incentives for change. Chard and Couch (1998) concluded that advocating for change should combine legislation, persuasion, and good examples. Heckel (2003) stated that supporters of universal design tend to adopt one of three stances: the pragmatist that argues the probability of improved market share, the moralist that advocates for the rights of people with disabilities, or the phenomenologist that sees the environment itself as the handicap.

Based on this literature review, three key findings informed and directed the design of this study. The first is the involvement of diverse participants as co-researchers as they have insider knowledge and experience of public buildings and experts have been reported to have limited success in promoting universal design. The second is the use of a standardised assessment for assessing the success of a building's design as there are currently few standardised tools available for this purpose. The third is the variety of

strategies that could be employed to market the concept of universal design. This study aims to uncover how users might go about influencing universal design in public buildings.

# **Chapter Three – Methodology**

*If you want to truly understand something, try to change it.*

(Lewin, n.d.)

This chapter gives an overview of the philosophical underpinnings of this study and introduces relevant ideas of the philosopher John Dewey (1859–1952), whose conceptualisation of inquiry, specifically scientific and sequential inquiry, has informed the cyclical nature of action research. Action research and participatory methodologies are recommended in the research literature as ways of advancing universal design research (Gossett, et al., 2009; Heckel, 2003; Stark, et al., 2008; Tokar, 2004).

Qualitative methods have been recommended to enable researchers to explore the complex relationships among person, environment, and participation in occupations (Law, 2002). Dewey's concepts of learning, pragmatism, and situation are specifically introduced as they link to the aims, process, and outcome of this study.

The history and philosophy of action research is reviewed, followed by a discussion of pragmatic action research and the role of the researcher in a pragmatic action research study. The chapter concludes by providing justification for pragmatic action research as the chosen methodology for this study.

## **Philosophical Underpinnings**

The philosophical ideas that became integral to action research methodology are based on the ideas of John Dewey, who was a sponsor of Kurt Lewin's programme of action research in the United States (Adelman, 1993). Dewey strongly criticised the separation of knowledge and action, observing that experimental science had become a mode of directed practical doing (Argyris, Putnam, & McLain Smith, 1985). Key to this is Dewey's notion of 'situations'. According to Dewey a situation is not an object or an event in isolation, but objects or events in their context (Evans, 2000). Inquiry is not considered to be a means or method to find truth, but a "means or method to reduce doubt and to restore balance to a problematic situation" (Evans, p. 314). Interaction becomes inquiry when consequences are anticipated, when the environmental conditions are examined and when activities are selected and prioritised according to the potential actualisation of the final situation (Dewey, 1938/1986). Inquiry, according to Dewey (1938/1986), has five key considerations: it involves making changes in the environing conditions, the pattern of inquiry is sequential, interpretation must be made on the level of the inquiry to determine when it is completed, as problems are resolved

new ones tend to emerge, and inquiry develops out of person-environment integration and interaction. Inquiries are situational, grounded in problems, integrative of theory and practice, and evaluative. “The integration of particular, non-expert, experience, fostered by the establishment of interaction and discussion, enables the community to better use the unique insights of the individuals” involved in inquiry (Dewey, 1932/1985, p. 343). Like the action research cycle, Deweyan inquiry does not give rise to universal answers or solutions; it is specific to a particular situation and is a continuing process (Hickman, 1990). As well as its links to the underlying theories of action research, Deweyan concepts of democracy, learning and situation are also utilised to support the analysis of this research.

### ***Democracy***

According to Dewey a democratic society has two key elements: the recognition of the varied points of shared common interest and the free interaction between social groups which allows for change in responding to new situations (Dewey, 1944). A democratic society makes “provision for participation in its good of all its members on equal terms” (Dewey, 1944, p. 99). Dewey believed democracy to be an ongoing, collective process of social improvement with all levels of society participating. It has to “evolve through people’s active involvement in making sense of their world and not through solutions imposed by powerful outsiders” (Greenwood & Levin, 2007, p. 60). Dewey believed that privileging the voice of the expert, the development and use of technical language and the erosion of communication has widened the gap between government and citizens (Dewey, 1954). Dewey also proposed that the ordinary citizens’ voices are often not heard and their participation in decision making and policy development is reduced to tokenism (Evans, 2000). In seeking to understand how building users can influence the design of public buildings, this study sought to involve ordinary citizens collaboratively in the decision-making process. Rather than privileging the voice of experts, the intention was to highlight the citizens’ own expertise in relation to barriers in public buildings.

### ***Learning***

Dewey (1944) was critical of the traditional style of teaching and learning in the 1940s. He did not believe in the separation of method from subject matter. Nor did he believe in routine, mechanically prescribed steps, or the separation of learning from concrete situations of experience. Dewey developed significant theories of learning and education, including that education is a social process and that it is society’s role to give

individuals an interest in social relationships and control in order to promote social change (Dewey, 1944). Citizens are considered to be shaped by education and need to be prepared to take an active stance and engage in their environment through inquiry (Evans, 2000).

Learning is something an individual does, and is an active occupation (Dewey, 1944). It is the product of “continuous activities or occupations which have a social aim and utilize the materials of typical social situations” (Dewey, 1944, p. 360). “Active experiential learning is fundamental to the notion of the human being as an active creator in his or her world” (Boog, 2003, p. 432). Dewey argued that experience must be the basis for knowing and that experience is never merely passive (Evans, 2000).

### ***Situation***

According to Dewey a situation is not an object or an event in isolation, but objects or events in their context (Evans, 2000). A situation is inherently doubtful, troubled, confused, or obscure (Dewey, 1938/1986). By confused and obscure, Dewey means that the outcome cannot be anticipated or the final consequences are not known.

Indeterminate situations “evoke deliberation resulting in decision” (Dewey, 1938/1986, p. 163). They require something to be done, but what action is to be taken remains in question. An indeterminate situation becomes a problematic situation when it is the subject of inquiry and is cognitively judged to be problematic. “To see that a situation requires inquiry is the initial step in inquiry” (Dewey, 1938/1986, p. 111). Public buildings have design barriers to some users and this has been recognised as problematic in New Zealand.

### **Origins and Philosophy of Action Research**

Kurt Lewin, a psychologist, was the first to develop a theory of action research in the social sciences, viewing it as “comparative research on the conditions and effects of various forms of social action, and research leading to social action” (Lewin, 1946, p. 202). Lewin utilised scientific inquiry while critically addressing social problems (DePoy & Gitlin, 2005), which Dewey referred to as situations. He particularly focussed on assisting minority groups to seek independence, equality, and co-operation through action research (Lewin). Lewin’s action research cycle involves planning, action, and reflection, with an emphasis on challenging positivist techniques and production of knowledge (Bargal, 2006). Action research stresses the development of discussion, decision and action by ‘ordinary people’ participating in collaborative research on situations that they have in common (Adelman, 1993). Lewin perceived the small group

as the most important vehicle for change and democratic decision making (Bargal, 2006). A fundamental tenet of action research is the commitment to work with local problem owners in a participative way aiming at solving pertinent issues (Greenwood & Levin, 2007; Levin, 2012). Lewin is also credited with changing the role of the researcher from distanced observer to involved participant (Boog, 2003; Greenwood & Levin). In this study, all participants were directly involved in facilitating the research and decisions were shared.

Greenwood and Levin (2007), in line with Dewey's ideas of democracy, proposed that creating spaces for debate and decision-making respects the diversity of individuals and groups. They rejected the consensus model of democratic process, believing that diversity of skills, experience, politics, ethnicities, and gender are the most valuable source of positive change in groups. Greenwood and Levin believed that the aim of democracy is to give rise to societies capable of emphasising, mobilising and celebrating the differences within them. This concept of diversity underpinned the design of the recruitment of participants for this study.

Values and moral commitment are considered integral to action research, which is "a transformation of the assumption that research can be value free" (Whitehead & McNiff, 2006, p. 26). Action research assumes that researchers bring their values with them and cannot study in a value-free way. The values that I have brought to the research study include democracy, equality, and participation. This is congruent with the values of action research which seeks to work collaboratively with 'problem owners', promotes the use of democratic processes in research methods, and values participation of marginalised groups in society.

Kurt Lewin valued democracy. As a Jewish person and an intellectual refugee from Nazi Germany, one of the drivers of his development of the theory of action research was to support the democratic process (Bargal, 2006; Boog, 2003; Greenwood & Levin, 2007). A participatory worldview is that all people must be equal participants in society, have equal opportunities for education and employment, and have the opportunity to share in all goods and services in society and participate in public and private decision making (Boog). This worldview fits well with the ethos of universal design.

Social change is needed to equalise opportunities for participation; the belief in the possibility for change is underpinned by the assumption that knowledge is uncertain and that there are multiple truths that are contextually dependent (Frank, 2011). Knowledge in action research is considered to be created rather than discovered (Whitehead &

McNiff, 2006). Through the process of planning, action, and reflection, new knowledge can be created through collaboration. Action research must include the active participation of those who explore and investigate the identified issue (Adelman, 1993). The group then makes decisions on how to proceed and monitors and tracks the consequences of the actions. This follows Lewin's belief in studying things by changing them in natural situations. This premise of study in natural situations informed the design of this research study.

### **Pragmatic Action Research**

Contemporary formulations of action research include pragmatic action research developed by David Greenwood and Morten Levin (1998). Greenwood, an anthropologist, and Levin, a sociologist, are both experienced in action research in community development in Western industrialised countries (Greenwood & Levin, 2007). Pragmatic action research focuses on practical knowledge and its development, and cooperation between concerned parties. It emphasises adaptation to situations based on the experiential learning of participants (Johansson & Lindhult, 2008).

Pragmatic action research is based on Deweyan pragmatism. Pragmatism is defined as “an approach that evaluates theories or beliefs in terms of the success of their practical application” (Oxford Dictionaries, 2012). Charles Sanders Peirce is credited with developing the philosophical movement of pragmatism in the 1870s. Peirce conceived of pragmatism as a methodology to clarify the meaning of concepts. Dewey further developed pragmatism as a theory of inquiry (New World Encyclopdia, 2007). In bringing a pragmatic approach to action research, Dewey acknowledged human development with the aim of improving “people’s social and democratic participation in society and to establish social equality and social justice” (Boog, 2003, p. 429). The solutions achieved are considered to be the best possible ones at that moment in time, given the resources at hand (Greenwood & Levin, 2007). The workability of the solutions is key and needs to be affirmed from the perspective of the problem owners (Greenwood & Levin). For Dewey, scientific research was not separate from democratic social action and, like the underlying philosophies of Lewin, knowledge was a product of continuous cycles of action and reflection (Greenwood & Levin).

Pragmatic action research values participatory democracy, and involves knowledge generation through action and experimentation (Boog, 2003). Real knowledge enables citizens to “adapt the environment to our needs and to adapt our aims and desires to the situation in which we live” (Dewey, 1944, p. 344). Pragmatic action research is

considered to have three central tenets: creating arenas for dialogue and mutual learning, cogenerative research, and multi-method techniques and work forms (Crist, Parsons, Warner-Robbins, Mullins, & Espinosa, 2009; Greenwood & Levin, 2007). Multi-method techniques and work forms are part of the method applied in this study and will be discussed in the Chapter Four.

### ***Creating arenas for dialogue and mutual learning***

The purpose of dialogue is to learn from one another, exchange creative ideas, and develop those ideas in relation to an identified issue (Johansson & Lindhult, 2008). A focus is on creating a working relationship with the community and recognising community partners as experts (Crist, et al., 2009). Knowledge construction processes need to involve researchers and local community stakeholders in the same learning-action process (Boog, 2003). This signals the importance of creating the space and opportunity for co-researchers to learn from each other.

### ***Cogenerative research***

Pragmatic action research is a strategy that aims to solve issues where problem owners and engaged researchers learn together and reflect in the same cogenerative process (Greenwood & Levin, 2007; Levin, 2012). The research process emerges from joint experience and shared reflections about the experience, which leads to the creation of new knowledge (Crist, et al., 2009). As with action research, one of the core activities of pragmatic action research is learning by reflection in small democratic groups where the participants are regarded as equals, though each recognised as unique individuals (Boog, 2003). Although all of the participants are equals, they differ from one another in that their expertise is in different domains. Each participant is an expert in the matters of his or her everyday life (Boog). I endeavoured to maintain a philosophical commitment to recognising the co-researchers as experts in their own experiences, in particular their experience of facilitators and barriers encountered in public buildings.

### ***Role of the researcher***

In pragmatic action research the researcher can bring a specific problem to a group of recruited individuals to develop an understanding of where the group is heading and what actions to take. Greenwood and Levin (2007) used the concept of the “friendly outsider” (p. 133) who interacts with a diverse group of people in dialogue and cogeneration to clarify ideas and to develop actions to solve a local problem.

The ownership of the pertinent issue belongs to the local participants, whose roles and obligations are linked to their local organisations and community. As with action research, the professional has an externally defined role. He or she facilitates the action research process, proposes the application of certain methods and techniques, and is responsible for producing the scientific texts (Boog, 2003; Levin, 2012). This separation of roles is considered important, both to give legitimacy to the research and to ensure that plans are decided upon and actioned by the participants (Levin). Specifically in pragmatic action research, it is up to the problem owners to work on solving the problem, while the action research professional's role is to develop activities and techniques to facilitate experiential learning and problem solving (Boog; Levin).

### **Justification of Methodology**

Pragmatic action research is an appropriate methodology as it is congruent with the research question. A pragmatic approach with its focus on what works, is considered by some authors to be essential to the implementation of universal design and universal design principles (Goldsmith, 2000; Heckel, 2003), particularly in industrialised countries, making it an appropriate choice for this research study.

It is also considered important that the values and principles of the research methodology are congruent with the researcher's professional discipline. In occupational therapy, advocacy and meaningful occupation are clearly aligned with the principles of action research, including participation and respect leading to democratic action (Letts, 2003). Meaningful occupation can be defined as an everyday occupation that is fulfilling and provides opportunities to engage with others (Law, 2002). There is a need to promote occupational justice and optimise inclusion and participation in society through universal design (Rickerson, 2009); occupational therapists have the knowledge and skills to become experts in this arena (World Federation of Occupational Therapists, 2012). Being able to access the community and engage in meaningful occupation is considered a right based on citizenship and is central to the practice of occupational therapy (Townsend & Polatajko, 2007). Occupational rights also include being able to develop health and social inclusion through participation in occupations exert autonomy in choice of occupations, and benefit from diversity of occupations (Townsend & Wilcock, 2004; Whiteford & Hocking, 2012). Participation in occupations is essential for emotional, psychological and skill development, and participation in work and leisure occupations in particular positively influences health and wellbeing (Law). For occupational therapists, enabling individuals and groups to

participate in decision making about community issues is an important and legitimate area of practice (Ripat, et al., 2010), though is often neglected (Ivanoff, et al., 2006). This makes pragmatic action research an ideal approach for researching with users of public buildings that inhibit access or that pose barriers to full participation in users' chosen occupations.

In order to promote occupational participation through improved access to public places, action research and pragmatic action research have been successful as methodologies for social change. Two of the key goals of action research include the achievement of action-orientated outcomes and that the results be relevant to the local setting (Herr & Anderson, 2005). An example of an action research study in occupational therapy that has made a difference was an analysis of access barriers for people who have had a stroke (Hammel et al., 2006). This study involved 20 participants evaluating a total of 60 home and community contexts. A refined participation audit tool was an outcome of the study, with consumer input considered a key factor in the revisions. The tool raised the awareness of the participants' significant others and their communities of environmental barriers and facilitators in specific settings including museums, libraries, and community centres. Methods to address the barriers to participation included peer support and mentoring (Hammel, et al., 2006). Likewise in another action research study in occupational therapy, 10 older adults identified a variety of barriers to participation in outdoor occupations and strategized a number of successful action plans, many in conjunction with their local city council, to address those barriers (Ripat, et al., 2010).

Several research studies in the interdisciplinary literature provide illustrative examples that the philosophical commitments of pragmatic action research are achievable. Of two pragmatic action research studies with vulnerable populations, one involved qualitative interviews with 260 Mexican American elders on factors which affected their home healthcare use (Crist, et al., 2009). In that study, the findings were deemed to be culturally relevant, and future interventions were identified to support the elders to 'age in place'. In the second study, 18 of 20 formerly incarcerated women involved in the development of a programme became successful leaders in the programme, their communities, and their workplaces eight years following release from incarceration (Crist, et al.).

## **Summary**

Pragmatic action research was the chosen methodology for this study and is congruent with the research question. Deweyan concepts of democracy, education, and inquiry guided the development of the planning for this study. This study sought to involve building users as democratic citizens, to educate them on universal design principles through experiential learning activities, and to guide them through a process of inquiry, aiming to resolve the problematic situation of the lack of accessibility and universal design in public buildings. Finally, this study endeavoured to create time and space to enable the diverse participants to learn from each other.

## Chapter Four – Method: Planning the Study

*Preparation is the key for any search conference to be successful and produce lasting change, so most of the conditions for doing successful searches revolve around effective preparation.*

(Rehm et al., 2002, p. xxii)

The methods used in this study are a sequence of planned steps followed by iterative actions that arose from reflections and planning during the study. As depicted in Figure 2, the study had a pre-planned phase followed by emergent actions. This chapter outlines the preparatory steps undertaken. It includes the primary methods of data collection and justification for their selection. Preparation for participant recruitment, maintenance of ethical requirements, and establishment of rigour are also discussed.

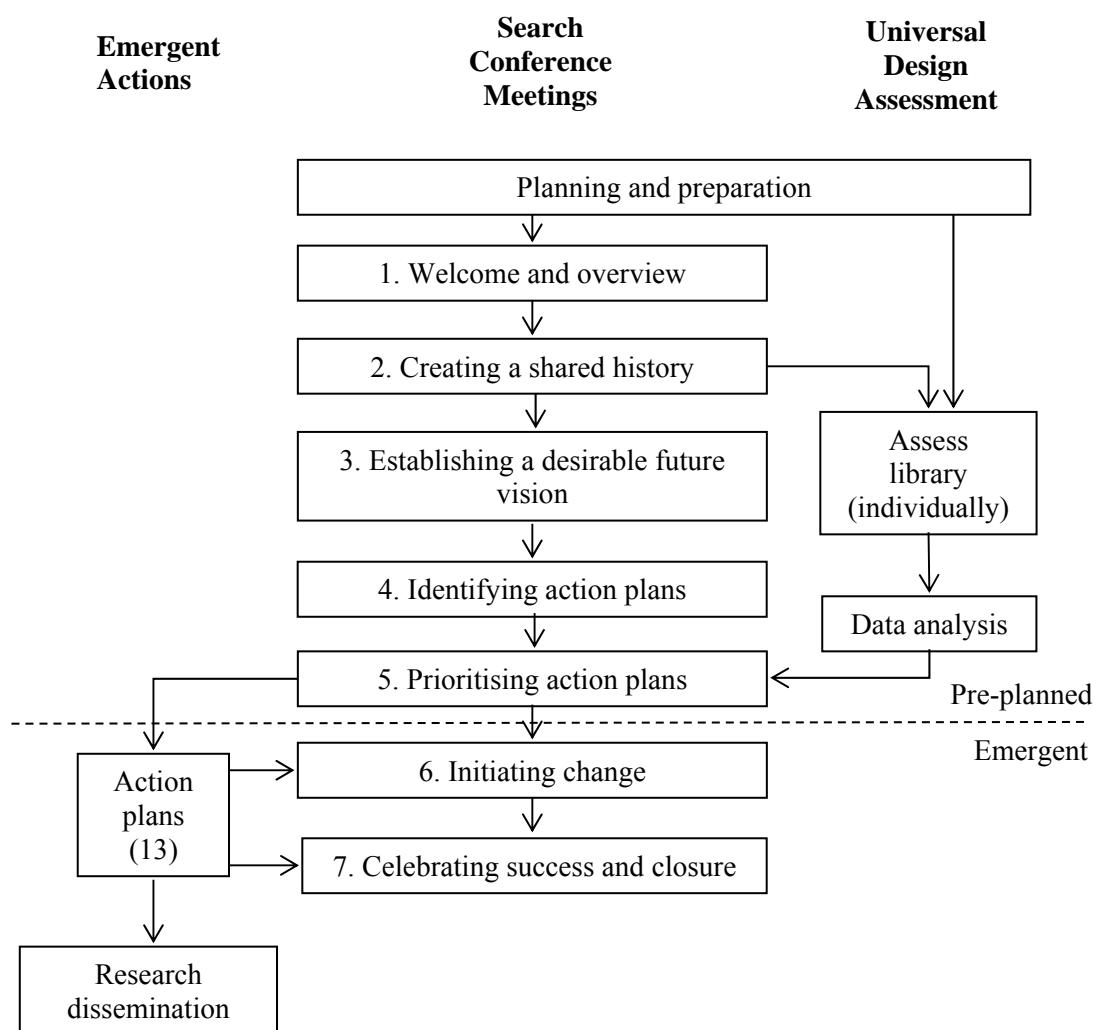


Figure 2. Overview of the study design

Consistent with pragmatic action research, a defined problem was brought to the co-researchers (Greenwood & Levin, 2007). The stated problem was that there are

environmental barriers in public buildings which affect people's ability to participate in their communities.

### ***Design decisions***

Greenwood and Levin (2007) argued that many theories, techniques, and work forms developed in the social sciences can be utilised in pragmatic action research. Two techniques selected for this study are a search conference, also known as future search, and an assessment of a public building. Consistent with that, the collection of both quantitative and qualitative data was planned (Greenwood & Levin). A search conference was the primary means of collecting qualitative data and the universal design assessment collected quantitative data. Multiple methods for data collection provide triangulation, increasing the validity of the research (Carpenter & Suto, 2008; Liamputpong, 2009). These data-gathering methods laid a foundation for action that would inform my research question.

#### *Search conference*

As discussed in Chapter One, a search conference is the type of work form used in this study. It was selected because search conferences aim to maximise participation and generate collective planning and actions designed to solve problems directly relevant to the people involved (Greenwood & Levin, 2007). A search conference is a good fit with the research question, congruent with pragmatic action research (Greenwood & Levin), is well described and documented as effective (Rehm, et al., 2002), has a timeframe and time commitment by co-researchers that could be accommodated within a Masters research project, and is well matched with my skill set as an occupational therapist. Future search is also one of a number of recommended techniques to encourage public participation in decision making (Office for Community & Voluntary Sector Department Tari mō te Rāngai ā-Hopori ā Tūa-o, n.d.).

'Searching' is about the conference community searching through the external environment and systems to collect, analyse, and synthesise data to be able to adapt and thrive in a changing world (Rehm, et al., 2002). The first search conference was designed in 1959 by Fred Emery and Eric Trist as they sought to engage complex organisations and social systems in learning processes leading to change (Pasmore, 1992). The future search was pioneered in the United States by Marvin Weisbord, an organisational development consultant (Weisbord, 1984). His workplace consulting was based on action research and was aimed at improving employee satisfaction and organisational performance in factories, offices, and corporations (Weisbord, 2012).

While search conferences were originally developed in the business world as a way for industrial organisations to collaboratively plan for future change, community development groups began to use this method in the 1980s as a tool for building healthier communities (Flower, 1995; Greenwood & Levin, 2007), which is one of the goals of universal design (Steinfeld & Maisel, 2012).

In the 1990s these methods gained in popularity at a time when increasing globalisation forced organisations and communities to become more responsive to change (Oels, 2009). Search conferences are considered to be a powerful approach capable of generating significant results in pragmatic action research studies (Greenwood & Levin, 2007). Search conferences have been used to research strategic plans for regional development and sharing limited resources in communities (Oels; Selin, Pierskalla, Smaldone & Robinson, 2007). The search conference method has continued to be developed. As part of the planning for this study, the decision to structure the search conference on the work of Greenwood and Levin and Rehm, Cebula, Ryan, and Large (2002) was taken, with several modifications to fit within this Master's research project.

### *Implementation plan*

The aim of the study was to look at public buildings through the lens of universal design: “the design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialised design” (Mace, 1985). In this study it was planned that the participants would first examine environmental barriers in public buildings, and then at ways that universal design may be promoted to improve community participation.

To achieve these aims, several modifications were made to the standard search conference format. The first modification was the duration of the search conference. A search conference is generally held over a period of two to three days (Oels, 2009; Weisbord, 1984). In this study, the process was modified to a series of meetings over an initial period of four weeks. This configuration was chosen so as to not overburden the co-researchers with a search conference scheduled for eight hours on two successive days. That decision was based on recent evidence from a study in New Zealand that people with moderate and severe disabilities have a high time cost associated with personal care activities. “Whether at work or at home, some activities just take more time – and the extra time spent doing activities of daily living means less time is available for other activities” (Disability Resource Centre Auckland Inc., 2010, p. 49). Spreading the sessions over an extended period also meant that first reactions could be

compared to later views, following periods of reflection between meetings (Blackburn & Stokes, 2000). Additionally, while a small research grant was received to complete this study, this funding was not sufficient to fund a weekend at a hotel for the group of seven participants, which is the method frequently adopted for business search conferences.

The meeting room in which the search conference meetings would take place needed to be large enough to accommodate all of the participants, but small enough for everyone to be able to see and hear what was going on (Rehm, et al., 2002). While it would have been optimal to hold all of the meetings in the same venue, room availability meant that the second meeting occurred in a different building. Seating in both venues was arranged around an oval table and whiteboards were available for use. Doodle<sup>3</sup> was used to schedule the meetings with the co-researchers. In preparation for the first meeting, co-researcher information packs were developed which included meeting dates and times for the first four meetings, an overview of the search conference process, an overview of the first meeting, a map of AUT's North Shore campus with directions, the principles of universal design (Connell, et al., 1997) – both text and poster versions – and my contact details for any questions or concerns (Appendix E).

Meetings were scheduled to range in duration between 1½ and 3 hours, with the three-hour sessions including a one-hour catered lunch break. The extended three-hour duration of the first two sessions was planned to facilitate bonding as a research group and to progress through several steps of the search conference within the first two weeks. It was also considered that the longer duration of the first two meetings would assist in creating the space needed for debate and decision-making respecting the diversity of the individual participants (Greenwood & Levin, 2007).

### *Reflection*

Greenwood and Levin (2007) emphasised the importance of reflection for action researchers. They argued that reflection is needed to enhance understanding and to uncover tacit knowledge. It was planned that following each search conference meeting I would record reflections on the search conference process in a journal, congruent with action research methodology (Reason & Bradbury, 2008). The reflective practice model from Fish, Twinn and Purr (1991) was used to guide the reflective process. This model involves four strands of reflective practice. The first is the factual strand, describing

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<sup>3</sup> Doodle is an online tool used to organise meetings amongst a group of people. Retrieved from <http://doodle.com/?locale=en>

what happened and pinpointing any significant or critical incidents. The second is the retrospective strand, which involves looking back over the event to seek patterns and new meanings and reviewing intentions. Next is the substratum strand, which aims to uncover assumptions, beliefs, attitudes, or values that underlie the event as well as the environmental demands of the situation. Lastly is the connective strand, where learning is reflected upon and changes and implications for future practice are discussed (Fish, et al.). The reflections were also treated as data and these data were revisited during data analysis. This is the culmination of the action research cycle, involving planning, action, and reflection (refer to Figure 3).

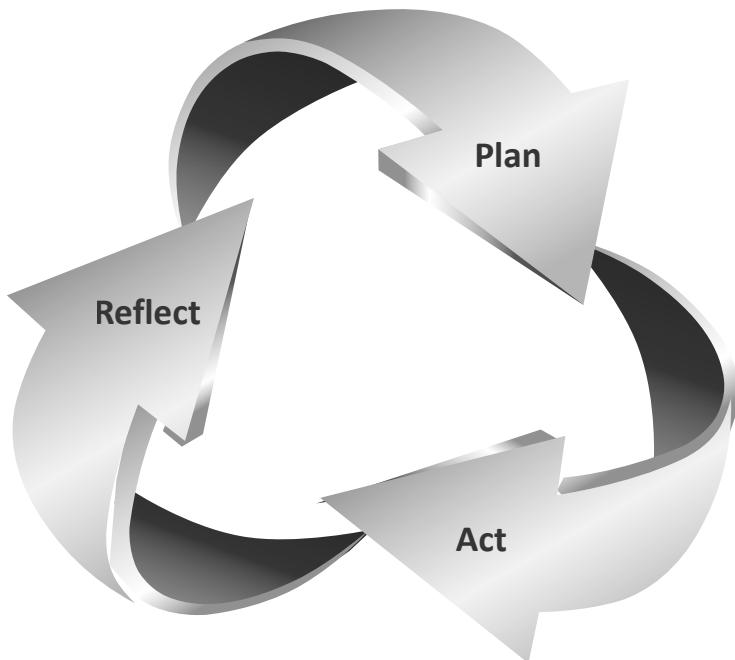


Figure 3. Action research cycle

#### *Co-generative learning activities*

In addition to the search conference activities were planned to enable the co-researchers to learn (Rehm, et al., 2002) about universal design and the universal design principles. To that end, I decided to have the co-researchers assess a public building against universal design principles which involved the collection of quantitative data. This is in line with the pragmatic action research principle of cogenerative learning, where the professional researcher seeks activities to facilitate a colearning process aimed at solving local problems (Greenwood & Levin, 2007).

Collection of quantitative data was planned to promote co-generative learning and understanding of the universal design principles. It was anticipated that some of the co-researchers would have little or no understanding of universal design prior to starting

this study. This was anticipated for several reasons: universal design was noted to be a relatively new concept in New Zealand, only appearing on websites and in government documents in the last decade (Ministry of Social Development, n.d.); minimal tertiary education opportunities were uncovered that focussed on universal or inclusive design; and the dominant discourse in New Zealand still appeared to be predominantly focussed on accessibility and barrier-free design (Barrier Free NZ Trust, 2011; Be.Accessible, n.d-b).

#### *Universal design assessment selection*

Planning for the experiential learning activity required a universal design assessment and a public building to assess. Greenwood and Levin (2007) recommend that local stakeholders be involved in the selection of techniques and data-gathering methods (Greenwood & Levin). My initial plan was to scope available universal assessments that would provide the quantitative data and a selection of potential public buildings to assess, and to bring a shortlist to the co-researchers for their decision on which to use. As discussed in the literature review, it is important to have objective and standardised measures for assessing the success of public building design (Afacan & Erbug, 2009; Cooper, et al., 1991; Iwarsson, et al., 2004; McClain & Todd, 1990; Stark, et al., 2008). However, the lack of such tools has also been noted (Steinfeld, 2012). Following the literature review, a specific search was conducted for universal design assessments of public buildings. The search terms were as follows: assessment, universal design, building. The same databases and Google and Google scholar were used. Only three assessments were uncovered: Housing Enabler, which had been modified for assessing public buildings and renamed as the Public Environment Enabler (Iwarsson, 1999), the Universal Design Audit Checklist (Levine, 2003) and Task Scenarios (Afacan & Erbug, 2009). I tried to access each of these assessments to determine their suitability for use in this study.

The Public Environment Enabler was sought as a potential assessment as reliability studies indicated it had good inter-rater reliability (Iwarsson, Nygren, & Slaug, 2005) and it is considered an objective tool and an extensive assessment for public places (Hovbrandt, Carlsson, Iwarsson & Ståhl, 2008). Upon contacting the researchers involved, I was informed that it was out of date and was, therefore, not available for use (personal communication, G. Carlsson, June 10, 2011). An updated version may be available in several years.

The Universal Design Audit Checklist (UDAC) has the simplest design out of the three available assessments, with assessors rating different areas of a public building on a scale of zero to three. However, this checklist has not been part of any research, either during its development or subsequently (personal communication, D. Levine, October 10, 2011). This checklist was not chosen for this study for several reasons. Careful review of this checklist revealed that it was based on the Americans with Disabilities Act (Americans with Disabilities Act, 1990); to achieve a score of one on this measure, the area being assessed must meet “code”, which in New Zealand would need to meet different legislative requirements. Secondly the scoring system of the UDAC did not appear to align, at times, with the philosophy of universal design. For example, there are noted to be many descriptors within the scoring system related to mobility difficulties, while sensory or other impairments are infrequently addressed. In addition, to achieve a score of three (the highest achievable) in any particular area appears to be somewhat arbitrary. For example, for service counters, “Counter heights are comfortable for a range of statures and for the uses intended” is given a score of two, while “Privacy conditions are similar for all users” is given a score of three (Levine, 2003, p. 219). These descriptors address different principles of universal design – the first addressing flexibility in use and size and space for approach and use, and the second addressing equitable use. It is unclear why achieving one universal design principle should receive a higher or lower score than another. For these reasons, the UDAC was not considered to be an appropriate tool for this study.

The Task Scenarios developed by Afacan and Erbug (2009) are based on the universal design principles and were designed to assess five aspects of public buildings: entrances and exits, circulation systems, wayfinding, obtaining a product or service, and public amenities (Appendix E). In each of these five areas, guiding questions relating to each of the seven universal design principles are given. For example, assessors are asked to consider all the entrances/exits on each floor regarding their equitable use, flexibility in use, simple and intuitive use, etc. However, this assessment had only been used by architects and planners up until that time.

#### *Adaptation of the universal design assessment*

Once the Task Scenarios from Afacan and Erbug (2009) had been selected as the most appropriate universal design assessment to use in this study, two adaptations were made, with permission (personal communication, Y. Afacan, September 15, 2011). The first was that the co-researchers in this study were requested to tick yes/no not to each of the

guiding questions, but to each universal design principle as a whole. This modification was made for two reasons. First, the guiding questions are examples of the universal design principles only; they are not the only way that each principle could or should be demonstrated. For example, within flexibility in use, a guiding question is, “Can it be operated right or left handed?”. Another way that this principle could be demonstrated is that it could be operated with an elbow or with a foot, which would still demonstrate the principle of flexibility in use, that the “design accommodates a wide range of individual preferences and abilities” (Connell, et al., 1997). This modification to the Task Scenarios was also done for pragmatic reasons. The modified tool, which has 35 yes/no questions, was thought to be more readily accessible than the original format which has 105 questions. A second way that the Task Scenarios were adapted was the layout. The Task Scenarios were originally published as an appendix in six-point font over two pages, which I considered to be too small for practical use. In producing the tool for the co-researchers, I chose to allocate the space on the forms so that each area (entrance and exits, wayfinding, etc.) of the tool was on a single A4 page with space provided for the co-researchers to write comments beside each of the principles being assessed. This was done to capture qualitative data which could provide greater detail and depth in addition to the yes/no quantitative results. Refer to Appendix F for a copy of the modified tool which comprises five pages of written assessment. In light of the limited use of the Task Scenarios for research reporting to date and the modifications implemented, it was planned that co-researchers would be asked to provide qualitative feedback about the tool itself.

### *Building selection*

Assessing a public building was an activity that was planned to facilitate the co-researchers’ learning about universal design in an experiential way. This is in line with Dewey’s concept of learning as an active occupation. One consideration in selecting a building to assess was that it be close to the location of the meetings, as participants in this research were required to fund some of their transport costs to attend meetings and to complete the assessment. The age of the building was also considered important as an older building may not meet basic accessibility standards. If a building did not meet basic accessibility standards, it was thought that the co-researchers would see their role as focussing on accessibility issues rather than on assessing how the building performed according to the universal design principles. Therefore, older buildings were not selected.

Several buildings were considered for this study: the Auckland Art Gallery, which had been significantly refurbished in 2011; Westfield Albany, a shopping mall which was opened in 2007; and the Birkenhead Public Library Te Whare Matauranga o Birkenhead. Neither the art gallery nor the mall was chosen due to their distance from AUT North Shore where meetings were scheduled. Additionally the significant size of the buildings could have required the participants to spend an entire day to assess them. The Birkenhead Library, which was founded in 1949, had a new, purpose-built building, opened in December 2009 (Thompson, 2009). As a public library, the building provides for a diverse range of participation possibilities. These include the loan of books and compact discs, author talks and bookchat sessions, a council area office, a community learning centre with access to computers and the internet, community meeting areas, English-as-a-second-language collections, homework help, housebound delivery, library tours, and a local history collection. It is “a place where people can work or volunteer and provides information on council and community activities” (North Shore Libraries, 2010). Lastly, this building was recommended by a Barrier Free Advisor from CCS Disability Action, who reported that this building met many accessibility requirements (V. Naylor, personal communication, January 19, 2012).

Ideally the co-researchers in this study would have been involved in both the selection of the universal design assessment tool and the selection of the public building to be assessed. However, as described above, few options were uncovered in relation to universal design assessments for public buildings or newly constructed public buildings in the vicinity of the meeting location. Therefore, both the universal design assessment and the public building were both chosen by me.

### ***Recruitment strategy***

As stated in Chapter Two, the research literature has been dominated by studies examining the interaction of people with mobility impairments and public buildings and occasionally those with visual and hearing impairments, but fails to include a more universal sample such as older adults and mothers (Gossett, et al., 2009; Heckel, 2003; Huss Pace, 2006; Ormerod & Newton, 2005; Saito, 2006). Accordingly, to inform the knowledge generation process (Greenwood & Levin, 2007), the purposive sampling strategy for this study was for maximum variation representing as much of the diversity of the Auckland population as possible within this small-scale study. The aim was to include participants across different ages, genders, and abilities (Liamputpong, 2009), capturing both biological and cultural diversity as well as differences in local

knowledge, everyday experience, historical consciousness, and capabilities. This led to the development of a pre-screening questionnaire, which included information on the prospective participant's sex, age, ethnicity, work status, household composition, and type of disability (Appendix G). Categorisations and definitions were drawn from Statistics New Zealand (n.d.). Participant diversity is considered to be a rich social resource that would give the group greater capacity for change and shaping knowledge relevant to action (Greenwood & Levin, 2007). Diversity is also considered an essential element in democracy, with many and varied points of view needed to work through conflicts to an improved situation (Dewey, 1944). I was also endeavouring to recruit participants with a specific interest in accessibility issues, which was highlighted on the flyer advertising the study (Appendix H) and was the final question on the pre-screening questionnaire about their interest in participating in the study. It was hoped that participants that had a particular interest in accessibility issues would commit to working on actions to promote greater accessibility and inclusion.

Action research rests on the premise that small groups are the most important vehicle for change and democratic decision making (Bargal, 2006). Bringing community members together to promote social change is a theme of many of the stories of recent social change movements in New Zealand (Hutchinson, 2011) and is a strong focus within Be. Accessible (Be. Accessible, n.d.-b). Literature also supports the use of diverse groups to promote more accessible and usable environments (Imrie, 1999; Steinfeld & Maisel, 2012). The intention was to recruit six to eight participants into the study. Although Kitzinger (1995) stated that an ideal group size is between four and eight, four was considered too few to offer variation, limiting discussion, and may have resulted in cancellation of a meeting if one or two participants were unable to attend (Bloor, Frankland, Thomas, & Robson, 2001). Conversely, more than eight participants in a group may mean that individual participants' voices would not be represented within the data, with participants feeling that their views and opinions have not been heard (Bloor, et al.). The focus in qualitative research is on richness and depth rather than sheer numbers of participants (Jones, 2002). The inclusion criteria were that participants be adults, aged 20 years and over, who were involved in an advocacy organisation or adults who provided support or care for individual(s) with an impairment(s) or experience of physical, cognitive, and/or sensory impairments. Any adults with cognitive impairment recruited to the study needed to be able to understand the information sheet and to provide consent to participate in the study. Advocates were chosen for this study for both the diversity of their lived experience of barriers and

facilitators in public buildings and their potential for work on implementation of the action plans developed by the group. This criteria is supported by search conference literature which states that members of the search conference be selected according to their knowledge of the system and potential for work on implementation (Rehm, et al., 2002). The exclusion criterion was any potential participant that was unable to provide informed consent.

The recruitment plan was to contact a range of advocacy organisations representing the diversity of the Auckland region by telephone or email including, two national organisations that are specifically dedicated to improving accessibility in the built environment – Barrier Free New Zealand Trust (2011) and Be. Accessible (n.d.-b). If the organisations indicated interest in promoting the study they would be emailed or mailed the Participant Information Sheets (Appendix I) and Flyers (Appendix J) for display in their offices as well as through their internal communication channels including newsletters. An easy-read Participant Information Sheet was also created at the request of Citizen Advocacy Auckland (2011), a community organisation that promotes the interests of people with intellectual disability (Appendix J). As advertised on the flyer, potential participants were invited to call, text, or email me to discuss the proposed research.

### ***Ethical considerations***

Ethical approval was sought and granted from the Auckland University of Technology (AUT) Ethics Committee (Appendix K). Ethics were considered according to the following principles: informed and voluntary consent, respect for rights of privacy and confidentiality, minimisation of risk, truthfulness including limitation of deception, social and cultural sensitivity including commitment to the principles of the Treaty of Waitangi Te Tiriti o Waitangi, research adequacy, and avoidance of conflict of interest (AUT, n.d.).

Informed consent involves providing complete and understandable information to participants regarding the research project (Liamputpong, 2009). This was accomplished through the information sheets which detailed the purpose, the research process, and any potential risks and benefits so that the individuals could make an informed decision about whether to participate (Appendix I). To minimise the risk of prospective participants feeling pressured to participate, a minimum of one week would be allowed to enable them to review the information prior to meeting me to confirm their interest. At that meeting the information sheet would be reviewed to ensure understanding

including repeating that they could discontinue participating in the study at any time prior to the completion of data collection.

Privacy and confidentiality of the participants' information is extremely important, particularly when working with people that are marginalised and stigmatised in society (Liamputtong, 2009). Several actions were planned in this regard. Signed consent forms and the pre-screening questionnaires would be stored in a locked filing cabinet in a locked office. The meetings that formed the basis of this study were audio-recorded and transcribed (Kitzinger, 1995). A confidentiality agreement was established with the transcriber (Appendix L). Participants would also need to protect the confidentiality of each other's information and this requirement was to be discussed with them during recruitment. Data would be kept secure within password-protected computer files, a locked filing cabinet in a locked office, and a locked car boot when in transport. In the event, all of these plans were actioned as described.

In addition, in undertaking this research project I was committed to the principles of the Treaty of Waitangi – partnership, participation, and protection (AUT, n.d.). In relation to partnership with Māori, I planned to have a Māori advisor. I sought an architect with knowledge of universal design. I planned to seek advice on the research design to ensure that there was opportunity for Māori to be involved as research participants.

Consultation took place with Rau Hoskins, director of the Design Tribe architectural practice specialising in kaupapa Māori building design (Appendix M). Initial exploration of concepts and philosophies such as te whakatinanatia i ngā wawata Māori o te taiao (the embodiment of Māori aspirations in the built environment) (Te Aranga: Māori cultural landscape strategy, 2008) was undertaken. These concepts reveal the importance of acknowledging a Māori world view that views physical landscapes as inseparable from occupations, events, and cultural practices.

### *Partnership*

Collaboration and partnership with participants was considered vital. Kanohi ki kanohi, pakihīwi ki pakihīwi (face to face and shoulder to shoulder) (Te Aranga: Māori cultural landscape strategy, 2008) is a principle that was planned for in all interactions with the co-researchers throughout this study. In action research, the researcher and the insider community are co-researchers in the process. Te Aranga recommended taking time to explore and celebrate together cultural difference and diversity in the built environment.

### *Participation*

As co-researchers, it was planned that the participants would be actively involved in collecting data, contributing to data analysis, and research dissemination. The benefits of participation in the study were made clear to participants through the participant information sheet: the research group would develop an understanding of the philosophy of universal design and have the opportunity to take action towards creating change to improve participation in their community.

### *Protection*

An acknowledgement is needed that I am Canadian, and therefore, have a western research perspective with some different values and different concepts of place, knowledge, language, and structures of power than those of the co-researchers. I planned to actively reflect on my values and beliefs both individually and through supervision sessions. Reflections were recorded in notebooks and assisted in guiding my actions and planning for each subsequent meeting. I was not aware of any conflict of interest arising from these differences at the outset of the research, and used reflections as a tool to ensure that no conflicts of interest arose during the course of the study.

It was considered unlikely that co-researchers would experience discomfort, embarrassment, or incapacity as a result of the research, though steps were taken to mitigate this possibility. For instance, discomforts that might have been faced included frustration at not being able to access part of a public building, recollecting previous experiences of discrimination, or conflict arising during the group meetings. Co-researchers would be advised that they could discontinue the assessment of the public building at any time and that they were eligible to attend three free sessions in person or online with professional counsellors from the Health, Wellbeing and Counselling at AUT, if discomfort or embarrassment arose through participation in this study (Appendix N). To my knowledge, none of the co-researchers availed themselves of this support service.

I had knowledge and experience of adult education and group facilitation, as a full-time lecturer for the two years preceding the commencement of the study. I reviewed conflict management strategies for groups with a senior lecturer prior to the search conference meetings commencing. Co-researchers would be encouraged to voice any discomfort if this was experienced within the group and/or to discuss any issues with me or the supervisors of the research project. Co-researchers would be invited to have a support person attend meetings, though none availed themselves of this option.

### ***Trustworthiness***

Credibility is whether the research findings can be trusted (Liamputong, 2009). A variety of methods can establish credibility: careful and purposeful selection of participants, keeping a reflective journal, member checking, and triangulation of the data (Letts et al., 2007b). Congruent with action research as a methodology, all of these methods were planned. For triangulation of data, multiple data-gathering methods and multiple sources of data were to be implemented. I planned to provide an audit trail documenting the decisions taken at each stage of the research to demonstrate dependability. Outcome validity or workability is a test of validity of action research of the extent to which actions occur (Herr & Anderson, 2005). This is linked to Dewey's notion of pragmatism, where knowledge is utilised in an activity to purposefully adapt the environment to meet identified needs (Dewey, 1944). Workability is considered a central aim of action research, and needs to be demonstrated from the point of view of the insider community (Greenwood & Levin, 2007). This would be discussed with co-researchers at the end of the study, to reflect on whether this had been achieved. In the following chapter the sources of data and the audit trail are provided.

Additionally, supervision and peer review were undertaken to promote trustworthiness. Meetings with my thesis supervisors took place on a monthly basis, guiding and challenging my interpretations of the data. This research was collaborative and the co-researchers were involved in the data collection. They were also invited to support, challenge, or modify the preliminary findings that arose from the study, consistent with peer review. This occurred through mail and email communications in July 2012 and August 2013. Critical reviews by stakeholders are considered to be the single most crucial technique in establishing credibility (Lennie, 2006).

### ***Search conference planning***

The final step of the preparation for this study was to plan the search conference. Due to the developmental nature of action research, only the first three meetings had detailed plans established in advance (Appendix O). Flexibility within the pre-planned meetings was expected and allowed for, and it was anticipated that the co-researchers would direct the next steps and actions (Greenwood & Levin, 2007). For example, the plans for the third meeting were altered based on direction from co-researchers. Search conferences have a set format of successive steps: creating a shared history amongst the participants, sharing a vision of a desirable future, identifying actions, choosing among the action plans, and initiating concrete change activities amongst the participants

(Rehm, et al., 2002). Refer to Table 3 for a summary of how the steps were scheduled in this study.

Table 3

*Planned Steps of the Search Conference*

Search conference steps	Agenda items	Time allocation
Welcome and overview	<b>Meeting 1 – Feb. 1, 2012</b> Welcome co-researchers to the search conference Provide an overview of the search conference Create group ground rules	3 hrs
Creating a shared history	Share hopes and expectations for the project Identify global perspectives on public building design Share personal history of barriers/facilitators experienced in public buildings Explore universal design as a design philosophy	
	<b>Meeting 2 – Feb. 8, 2012</b> Trial the universal design assessment at AUT Discuss the trial of the assessment at AUT Questions regarding the upcoming assessment of the Birkenhead Library	3 hrs
Establishing a desirable future vision	Develop a future vision	
Identifying action plans	<b>Meeting 3 – Date TBC</b> Brainstorm action plans to promote universal design	1½ hrs
Prioritising action plans	<b>Meeting 4 – Date TBC</b> Prioritise action plans	1½ hrs
Initiating change	<b>Outside of Meeting time</b> Progress action plans	3 months
Celebrating success and closure	<b>Meeting 5 – End of May 2012</b> Reflect on the action plans that were completed	1½ hrs

*Planning for the first meeting*

Consistent with literature on running groups, it was planned that the group would create group ground rules (Kielhofner, 2009). While not a specific step within a standard search conference, I considered this important to include to ensure the safety and comfort of group members. It was planned that the participants would have access to refreshments throughout the meeting and a shared lunch served buffet-style; this is also reported to assist in rapport building (Rehm, et al., 2002).

Creating a shared history is considered important, as this is about letting every participant understand how the world looks according to others (Rehm, et al., 2002). To start this process, participants would be invited to share their hopes and expectations for

the search conference (Rehm, et al.). This is considered to be a warm-up activity aimed at helping participants get to know one another and clarifying the group's expectations. To further create a shared history, in the second half of the meeting it was planned that co-researchers would identify worldwide changes in the last five to seven years that could influence the design of public buildings in the future. The reason for this step is for the co-researchers to see that their community exists within a much larger context. Starting with this environmental scan aims to ensure a direct connection between the future of the community and the direction of the global environment (Rehm, et al., 2002). These influences could be demographic, economic, environmental, institutional, social, or technological in nature. To capture the co-researchers' views, they would be invited to participate in a brainstorm, a technique reported to provide an encouraging environment for all those present to participate and contribute fully to the discussion. Group brainstorming takes advantage of bringing together members' creativity and diverse experiences (Osborn, 1963). The ground rule for the discussion was that all perceptions of the environment are valid and written down on chart paper to be recorded (Rehm, et al.).

#### *Experiential learning activity*

The last part of the first meeting was unique to this study, and not a specific part of a standard search conference method. They would be invited to share their personal experiences of barriers and facilitators in public buildings. It was anticipated that this would assist the group to bond over shared experiences and also to continue to share what the world looks like according to each participant, part of creating a shared history. In addition, while the co-researchers were aware of accessibility issues in public buildings, it was anticipated that not all of the co-researchers would be familiar with the philosophy of universal design.

These experiential learning activities (Dewey, 1944) were planned to introduce the co-researchers to universal design and the universal design principles. It needs to be noted that this was not training or education in universal design by the researcher as 'expert'. Avoidance of explicit teaching is in accordance with search conference methods, which avoid moving back and forth between bureaucratic and democratic design (Rehm, et al., 2002) as co-researchers moving from passive learning to active engagement might result in 'fight or flight' reactions. The co-researchers are adult learners and were given responsibility for their own learning, bringing their wealth of knowledge and experience to the table.

### *Planning for the second meeting*

The final element of creating a shared history was a further experiential learning activity trialling the universal design assessment. Again, this exercise would be a departure from the standard search conference format. The participants were to be asked to use the universal design assessment to assess aspects of the building in which we were to meet, and then come back together to share their observations and discuss any questions about it. This activity was planned for two reasons. First, it would assist the co-researchers in becoming familiar with the assessment of a building according to universal design. Secondly, they would discuss their findings together in both small and large groups, which was planned to assist the group in seeing the building through the eyes of the other participants. By discussing the findings first within small groups, it was hoped that the group members would feel safer to share their thoughts and ideas within the larger group.

It was planned that co-researchers would visit and assess the library independently of each other outside of meeting time. Prior to the co-researchers assessing the Birkenhead Library, I completed my own assessment of that building's alignment with universal design principles. I did this for several reasons. I tried to identify whether there were safety hazards that could affect the co-researchers. I ascertained that the library was a suitable size to be assessed, large enough to have a variety of areas to assess, but small enough that it could be assessed on a single visit. I reviewed the language used in the tool in relation to the library environment and made very minor amendments to wording, such as removing the word "shopping" from the original Task Scenario statement "Approaching all the stairs/elevators and escalators from the shopping corridors regarding their low physical effort...".

Having completed the experiential learning activity and briefed the co-researchers about the next activity, I planned to resume the standard search conference format. The second step of a search conference is to create a shared vision of a desirable future. This step is about the group collaborating to develop and create a vision statement (Rehm, et al., 2002) of how the community should look by the end of the next decade (Greenwood & Levin, 2007). I chose a 10-year timeframe for this visioning process as this was considered long enough in the future to enable 'big-picture thinking' while short enough to ensure that concrete action plans could be developed to lead towards the vision statement (Flower, 1995).

### *Planning for the third meeting*

This meeting had the least amount of detailed advance planning to allow for flexibility of the group process. Having created a shared vision, the next step in the search conference process is for the group to identify action plans to achieve the vision (Rehm, et al., 2002). It is important in this step to come up with as many ideas as possible, discounting none. Co-researchers may ask each other questions for clarification, but all ideas are treated as worthy of consideration and criticism of the ideas of others is not permitted (Greenwood & Levin, 2007). This caveat is to encourage sharing, creativity and possibilities for future action within the group. The broad plan was for another brainstorming session ensuring that all of the participants had the opportunity to contribute their ideas. It was also planned that the group may begin to prioritise the action plans, a process likely to continue into the fourth meeting.

### ***Summary***

This chapter has detailed the design decisions made prior to the commencement of participant recruitment. This included the work form of a search conference, as well as the added steps of assessing a public building according to universal design. The search conference technique was chosen due to its fit with the research question and methodology and its participatory structure. The assessment of the public building was planned as an experiential learning activity, as it was expected that not all of the participants would be familiar with the concept of universal design at the start of the study. Assessing a public building also provided a possible opportunity for the participants to develop actions from this assessment to promote universal design.

## **Chapter Five – Enacting the Method**

*To achieve a society where products and environments are designed to enable optimal participation by all people.*

(Universal design research group, meeting 4)

This chapter provides the details of the actions that took place in this pragmatic action research project. It encompasses actions that took place both during and outside of the modified search conference. Reflections which influenced the planning for the subsequent meetings, forming part of the cyclical nature of action research are also detailed. In addition, the methods employed for data analysis are described. As this study used mixed methods, different strategies were required to analyse the quantitative and qualitative data (Bailey, 1997).

### **Recruitment**

Twelve organisations were approached and provided with information packs including flyers and participant information sheets. Participants were successfully recruited from each of the following organisations: Age Concern (2012b), CCS Disability Action (2011), Disability Strategic Advisory Group (Auckland Council Te Kaunihera O Tāmaki Makaurau, 2012b), Never2old (AUT University Te Wānanga Aronui O Tāmaki Makau Rau, 2011), and the Women’s Health Action Trust (2011). An additional two potential participants contacted me regarding this study, one from Be Leadership who was unable to attend regular meetings in Auckland, and one who did not name an organisation and did not respond to reply emails. Approaches to the following six organisations did not generate participants: Barrier Free NZ Trust (2011), Citizen Advocacy Auckland (2011), Grey Power (2011), New Zealand Multiple Births Association (2009), and Te Roopu Waiora Trust (2009).

When potential participants made contact, it was confirmed that they had a copy of the information sheet. If they did not, one was emailed or mailed to them. A meeting was arranged with each of the seven potential participants at a place of their convenience to check that they understood the consent form (Appendix P), and to answer any questions that they may have regarding the study. If they indicated their willingness to participate, they signed the consent form indicating their willingness to complete the pre-screening questionnaire and be considered for inclusion in the study. The pre-screening questionnaire was then completed. In addition, addresses were collected to ensure the

prospective participants were not too geographically dispersed so that they could readily attend meetings (Ripat, et al., 2010).

Prospective participants were made aware that if selected, they would be responsible for securing permission from their workplace to take part in the project. For some this included attending meetings during work time. They would also be responsible for establishing organisational parameters about sharing information about their workplace. It was important for confidentiality purposes that they felt free to share their personal opinions, which may or may not have aligned with those of their employer. Following those meetings, the pre-screening questionnaires were reviewed to ensure there was diversity between the participants. Prospective participants were then contacted by telephone to confirm that they had been selected for inclusion.

### ***Co-researcher characteristics***

All seven prospective participants met the inclusion criteria and were selected to participate in this study. They ranged in age from 30s to 60s, with an average age of 46 years old, and were predominantly female. The majority were New Zealanders, with no one identifying as Māori volunteering to be a part of this study. Employment status varied across the group and the majority belonged to single-family households. Co-researchers included five people with disabilities, two of whom used mobility aids (a wheelchair or a quad stick), and three of whom used other aides (a white cane, a guide dog, or hearing aids). The two co-researchers without a disability were an older adult and a mother of a young child. Refer to Table 4 for demographic characteristics of the co-researchers.

Table 4

*Demographic Characteristics of the Co-researchers*

Characteristic	Number of participants (n=7)
Gender	
Female	6
Male	1
Geographic origin	
New Zealand	5
European	1
African	1
Work status	
Employed full-time	3
Employed part-time	2
Unemployed	1
Not in the labour force	1
Experience of disability	
Physical	2
Sensory	3
None	2

**Conducting the Search Conferences**

Refer to Table 5 for a summary of how the pre-planned steps were completed in this study.

Table 5

*Completed Steps of the Universal Design Research Group Search Conference*

Search conference steps	Agenda items	Time involved
Welcome and overview	<b>Meeting 1 – Feb. 1, 2012</b> Co-researchers welcomed to the search conference Overview of the search conference provided	3 hrs
Creating a shared history	Shared hopes and expectations for the project Created group ground rules Identified global perspectives on public building design Shared personal history of barriers/facilitators experienced in public buildings Explored universal design as a design philosophy	
	<b>Meeting 2 – Feb. 8, 2012</b> Shared reflections from Meeting 1 Trialed the universal design assessment at AUT Discussed the trial of the assessment Conducted preparatory work for developing a future vision	3 hrs
	<b>Outside of Meeting Time</b> Assessed a public building using the universal design assessment	1–2 hrs
Establishing a desirable future vision	<b>Meeting 3 – Feb. 15, 2012</b> Shared reflections from Meeting 2 Mind-mapped ideas from Meeting 2 to form themes Discussed several proposed vision statements	2 hrs
Identifying action plans	Brainstormed action plans to promote universal design	
Prioritising action plans	<b>Meeting 4 – Feb. 22, 2012</b> Finalised a future vision Prioritisation process created for progressing action plans Developed a skills matrix Leader and co-researcher contributors volunteered for each action plan Collaborated to develop a work plan and communication strategies between the co-researchers	2 hrs
Initiating change	<b>Outside of Meeting Time</b> Leader of each action plan coordinated and progressed the action plans with the assistance and contributions of co-researchers	1½ months
	<b>Meeting 5* – Apr. 16, 2012</b> Reflected on the co-researchers' experience of the library Reflected on the universal design assessment Discussed progress of the action plans: 4 action plans completed, 3 new action plans identified, 4 action plans progressed	2 hrs
	<b>Outside of Meeting Time</b> Completed 13 action plans	1½ months
Celebrating success and closure	<b>Meeting 6 – May 28, 2012</b> Reflected on the action plans that were completed Reflected on the search conference process Planned for research dissemination	2 hrs

\* Requested by co-researchers.

Participation was enabled through the search conference process, where co-researchers exercised influence over the development of the research. In this study, a series of six meetings over four months formed the cyclical process of action research, with reflection on the previous meeting taking place at the start of the meeting and each meeting building on the previous one. Two types of reflections are presented, reflection on action and reflection in action. Reflection on action involves stepping back from the situation with reflection occurring some time after the situation has occurred (Schön, 1983). These reflections on the meetings were recorded in my reflective diary one to five days following each meeting. Reflection in action took place whilst I was involved in the meetings with the focus on gaining a new perspective (Schön). Where a search conference step extended over more than one meeting, multiple action and reflection cycles were recorded. Each step of the method that was carried out will now be reviewed.

### *Step 1 – Creating a shared history*

#### *Action*

It was important in the first meeting for the co-researchers in this study to begin to develop trust in each other to be able to share experiences and to contribute to the research project (Selin, Pierskalla, Smaldone, & Robinson, 2007). These co-researchers, unlike participants in many search conferences, did not belong to a single organisation, but rather a range of community organisations. To build rapport within the group, in the first meeting the co-researchers were invited to introduce themselves and why they were interested in this research study. They then shared their hopes and expectations for the project (Rehm, et al., 2002), this was completed in a round robin with co-researchers volunteering to speak.

Group ground rules were created by the group (refer to Figure 4). I explained the purpose of creating ground rules, which are to confirm expectations of each other and to support participation by all of the group members. I instigated the process asking for suggestions from the group. I wrote their rules on large poster paper, amending and adding to them as the ideas were suggested. They developed written expectations of behaviours and actions that would demonstrate respect for each other. These included maintaining confidentiality of each other's information, debating ideas rather than each other, speaking clearly one at a time, and recognising that they are all learners. During the discussion on ground rules the co-researchers agreed to further preserve their anonymity by having only their first names employed during transcription. The group

ground rules were distributed to all of the co-researchers as part of the first summary document and the poster was brought to all subsequent meetings. The group ground rules were revisited from time to time over successive search conference meetings, checking in with the co-researchers as to whether they wished to add or amend the ground rules as the meetings progressed, though no changes were suggested to the original five ground rules.

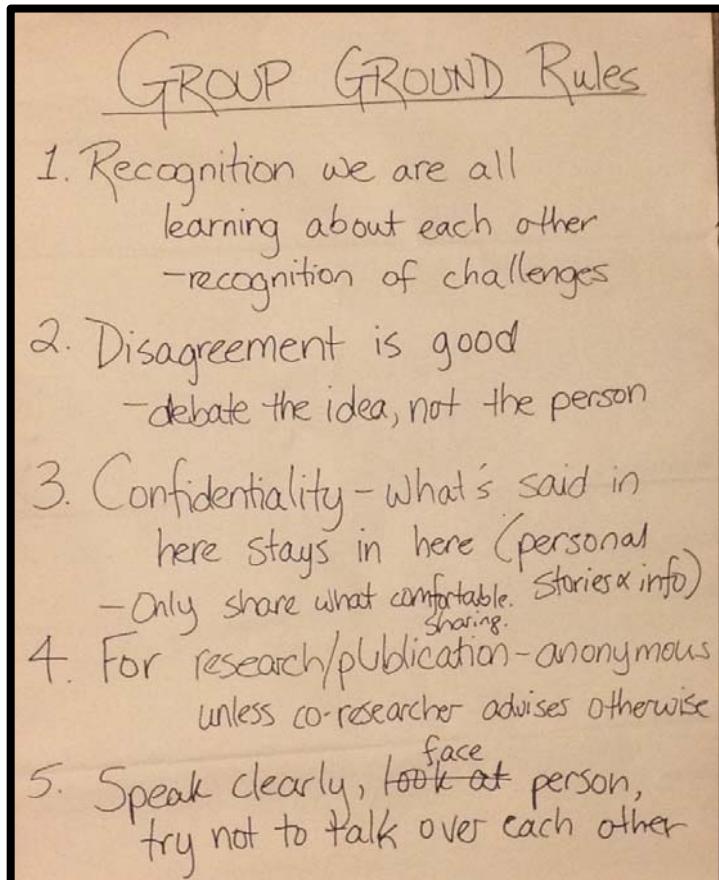


Figure 4. Poster listing the five ground rules decided upon as a group. Photographer: Elise Copeland, ©2012.

#### *Reflection in action*

Following the development of the group ground rules, co-researchers brainstormed a multitude of factors affecting the design of public buildings including economic, environmental, social, and technological ones. Initially the factors that were discussed were primarily global as per the plan. In line with search conference methodology, factors identified were written on large sheets of paper and placed on the walls. Rehm et al. (2002) stated that displaying the sheets on the walls demonstrates that all information in the conference is shared openly and publicly. I considered it important to read the list aloud following its completion to ensure that those co-researchers with visual impairments that could not see the poster had the opportunity to hear the list again.

After listening to the list, the group decided to have a discussion regarding factors that were particularly important in the New Zealand context. These were subsequently circled on the poster (refer to Figure 5). The ideas raised by the co-researchers were included in the summary document of the first meeting.

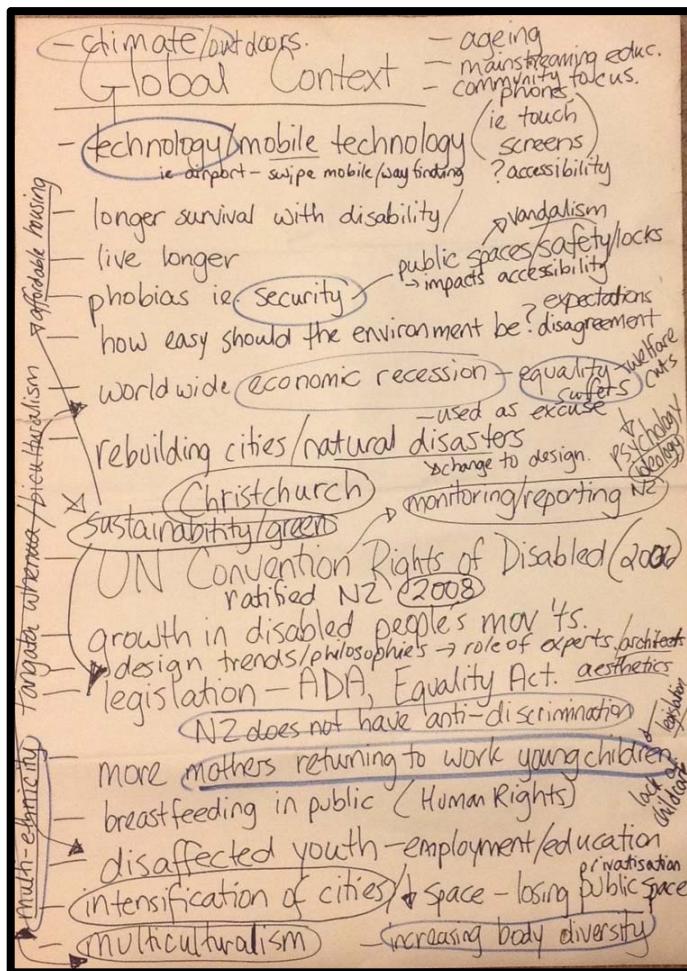


Figure 5. Results of the brainstorming session on the global context and potential influences on public building design. Photographer: Elise Copeland, ©2012.

Co-researchers were then asked to share examples of barriers and facilitators they had personally experienced in public buildings, to assist in building a sense of community and trust within the group (Flower, 1995). Co-researchers appeared to readily engage in this activity, and the examples that they gave were varied, an indication that the recruitment goal of diversity had been achieved. The sharing of experiences enabled the group to begin to understand barriers experienced by others within the group.

Time was then spent as a group exploring the concept of universal design and the universal design principles. The co-researchers were encouraged to discuss the principles and link examples to their own experiences. They discussed the concept of

universal design and the universal design principles in self-selected small groups and then shared ideas with the large group.

Prior to each meeting an overview of the upcoming meeting (Cole, 2012) and a summary of the previous meeting were emailed or mailed to all of the co-researchers (Appendix Q). Email was the preferred method of communication for four co-researchers; mail was the preferred method for two that did not readily have access to email. Regular communications are considered key in search conferences as they help to build commitment and practical involvement as well as keeping in contact with all of the co-researchers (Rehm, et al., 2002).

#### *Reflection on action*

Upon reflecting on the first meeting, several areas were identified which impacted on the planning for the next meeting. The first was that I had not had an opportunity to greet the co-researchers at the entrance to the building as they arrived. Concerned that this did not set a good tone for the meeting, and reinforced by the literature emphasising the importance of facilitating relationship and trust building (Rehm, et al., 2002; Selin, et al., 2007), I planned to greet co-researchers as they arrived for subsequent meetings. To further ensure that the co-researchers felt orientated and welcomed, I mailed maps out again in advance of the second meeting as it took place in another building.

Secondly, one of the initial activities designed to create a shared history was reflected upon. All of the co-researchers shared their personal narratives of barriers and facilitators experienced in public buildings, spontaneously passing the voice recorder from one person to another. Given the importance of all co-researchers having the opportunity to be heard (Rehm, et al., 2002), this passing of the recorder appeared to be an effective way to ensure each person was given the space to speak. To facilitate this in future meetings, I planned to use the round-robin technique again (Cole, 2012).

Lastly, I noted that jargon and abbreviations were occasionally introduced by co-researchers who worked in the disability sector, such as UNCRPD (United Nations Convention on the Rights of Persons with Disability). To ensure inclusion of all of the co-researchers in discussions, I asked the co-researchers to explain terms to the rest of the co-researchers. I planned to monitor this and continue to request explanations as needed.

### *Action*

Immediately prior to starting the second meeting I forewarned staff in the building that a group of co-researchers would be assessing public areas of the building. At the beginning of the meeting co-researchers were invited to discuss any questions, concerns, or reflections from the prior week's meeting. The group discussed barriers they encountered on arrival to the new meeting room including lack of adequate signage and placement of a kerb cut that was not intuitive as it led to a window rather than a door. There was a discussion on whether that 'failure' in design was a result of the designers/architects having a specific reason for designing it that way, or whether they simply did not think of the potential issues for people as a result of their design choices. One co-researcher made a correction to the summary regarding the process for informing building owners of issues with a building. Lastly the discussion on the differences between accessible and universal design raised the point that minimum standards, including accessibility legislation, is often not usable by the population for which it was intended. For example, the size of a wheelchair turning circle that is legislated for in public buildings is too small for many wheelchair users to be able to turn themselves, such as within an accessible toilet.

The outline for the meeting was then discussed so that all of the co-researchers were aware of the plan for the meeting. Co-researchers were then invited to trial the universal design assessment that they would be using to individually assess a public building. The co-researchers worked in pairs or groups of three, with each group completing one aspect of the tool to assess the building in which we were having our meeting (refer to Figure 6).



*Figure 6.* Photograph of the front entrance of the AG Building, AUT University, Auckland.

Photographer: Elise Copeland, ©2012.

Different groups assessed different areas of the building: one pair assessed the entrances and exits, one pair assessed obtaining a product or service, and a group of three assessed the public amenities. Co-researchers self-selected their group for this trial, with the suggestion that one person be nominated in each group to record their findings. A range of ages and abilities were represented within each small group. This trial was done in small groups to enable the co-researchers to share ideas on what they were observing as well as to learn about barriers that other people may face in public buildings. When the groups had trialled the tool, they came back together as a larger group to share their findings and ask questions in relation to the tool.

#### *Reflection on action*

Reflecting on the second meeting, there was evidence that the co-researchers had been reflecting on their experiences from the first meeting. They were already demonstrating incorporation of universal design principles into their thinking. Reflections and discussions were beneficial as a warm-up activity for trialling of the universal design assessment as well as building further rapport within the group.

I reflected on the two rooms in which we had had our search conference meetings. Greenwood and Levin (2007) advocate for search conference venues being retreat-like. Rehm et al. (2002) advocate that the venue needs to be a ‘social island’ where people can get away from the standard work pressures, emails, and phone calls to enable people to have the space to think, reflect, and dream. It became clear upon reflection that these two rooms, while functional, did not create the impression of being at a retreat. The second meeting took place in AG, a different building on AUT’s North Shore campus. While this meeting room was slightly larger and brighter, the social and physical environment overall was less welcoming. A complaint was received about the noise that the group was generating. The staff in this area did not offer any assistance to the group members, unlike when the meeting occurred in the AD building. The toilets in AG were more difficult for the co-researchers to use due to their distance from the meeting room, having to pass through four doorways to access them, and the small size of the cubicles. In addition, one of the doorways to the meeting room has a push button to open a glass door. This door did not stay open long enough for either the wheelchair user or the quad stick user to pass through. In discussion with the group, a complaint was raised to Health and Safety at the university regarding this doorway and to request that all of the timings on the push-button access doors be reviewed to ensure that they do not pose a hazard. As the initial meeting room was in a building at AUT North Shore which is the venue for interdisciplinary health clinics, it is possible that the staff in this area are more experienced in working with people with disabilities and that the space was better designed to accommodate a wide range of abilities. From this reflection, I planned to hold as many of the rest of the meetings as possible in the initial meeting room. I also planned to remove additional chairs within the meeting room to allow for ease of movement of the co-researchers during the meeting, to assist the co-researchers to act as co-facilitators within the meeting (Greenwood & Levin).

#### *Action*

Group members agreed that they could complete the universal design assessment of the Birkenhead Public Library (Figure 7) within a two-week period (between meetings two and four). They were advised to use whatever strategies they would normally employ in exploring a new building, which could include having a friend with them or making use of assistive equipment or mobility aids. Consistent with Thapar et al. (2004), co-researchers were provided with a map of the location of the library, the assessment tool, and an information form with details of the study and contact details of the researcher

(Appendix R) to take with them in case they were questioned as to the purpose of their visit. I advised the co-researchers that if they had not completed the assessment within two hours they should discontinue. There were two reasons behind this advice: first, to not overburden the co-researchers who were already giving a very significant amount of time to this research, and second, if the tool took longer than two hours to complete, the universal design assessment would be considered not practical as a tool for general use. The group decided to modify the assessment to record the date and the amount of time they took to complete their assessment. The group proposed that they would review their findings at the fourth meeting, so that although they would conduct the assessment individually, this experience would become part of their shared history and shared learning about the universal design principles.



*Figure 7.* Photograph of the front entrance of the Birkenhead Public Library and Civic Centre, Auckland. Photographer: Elise Copeland, ©2012.

All co-researchers committed to and completed the assessment by the fourth meeting and provided their assessment forms to me either in hard copy format or electronically. The research group had spent six hours together prior to conducting the assessment of a public building, which could be considered a short period of time in which to learn about the concept of universal design and how to use the assessment. Co-researchers took between one and two hours to complete the assessment, with an average time of one hour and forty minutes.

## *Step 2 – Establishing a desirable future vision*

### *Action*

In this study the second step was about coming together as a group to develop a vision of an ideal future for the community (Greenwood & Levin, 2007). In this study an ideal future was considered to be one where universal design is widely employed in New Zealand. While it was planned that this step would be completed during the second meeting, although it was initiated then, it was not completed until the fourth meeting. In the second meeting the group brainstormed ideas of a future vision and recorded these ideas on poster paper. Following the meeting, these phrases were listed in the summary of the second meeting (Appendix Q), which was emailed or mailed to the co-researchers in advance of the third meeting. I typed the phrases, printed them in a large font, cut them into strips, and brought the strips to the third meeting as a tool to continue the discussion of the future vision (Rehm, et al., 2002). The co-researchers worked collaboratively following a nominal group technique (Delbecq & VandeVen, 1971) to group these phrases into themes and to create links between the themes (Figure 8). This technique has been found to allow for balanced participation between group members (VandeVen & Delbecq, 1974). Several co-researchers physically arranged the phrases on the table and verbally checked in with the other co-researchers to seek consensus.

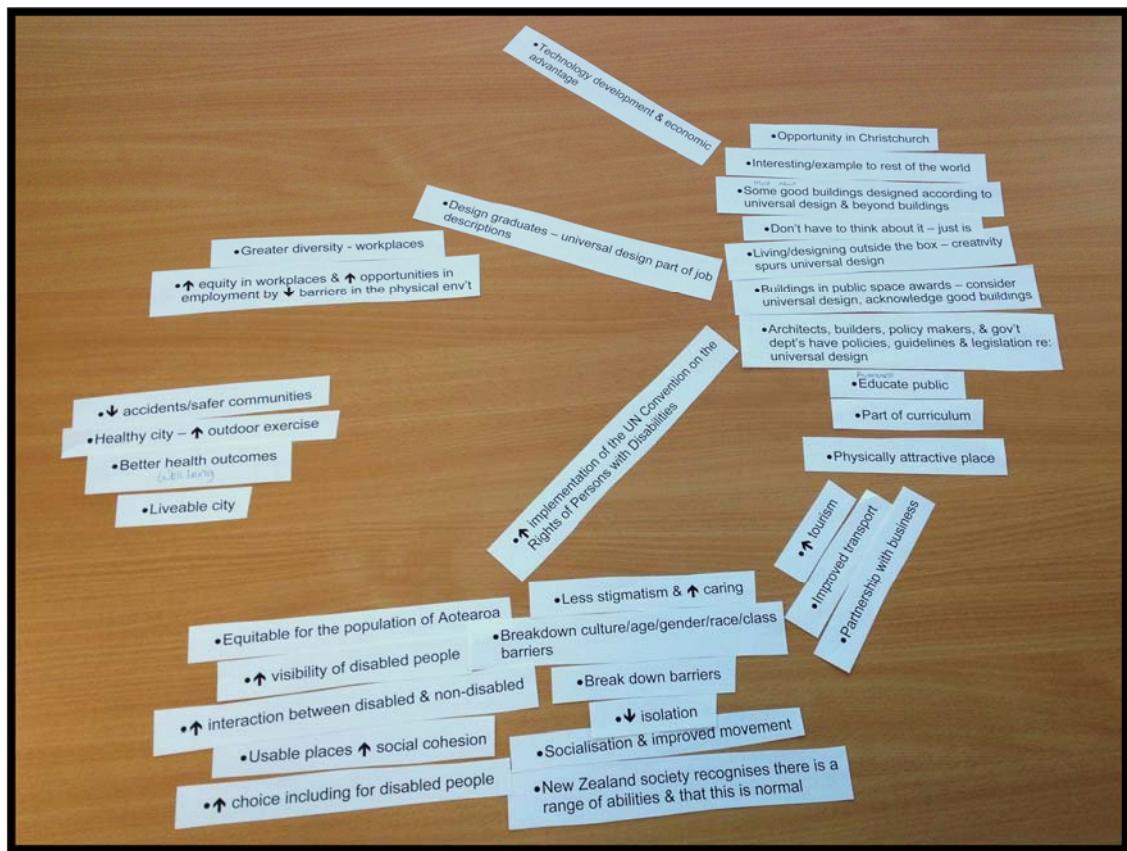


Figure 8. Photograph of typed phrases arranged by the co-researchers to create the future vision.

Photographer: Elise Copeland, ©2012.

Another co-researcher volunteered to be a scribe to capture the group brainstorm, using a whiteboard to write up the initial shared vision statement: “The population of Aotearoa can go about their daily lives with decreased barriers” (Figure 9). Below the vision statement five themes that were collaboratively developed were also captured: education and awareness, equity and inclusion, workplace/employment, wellbeing, and technology and economics.

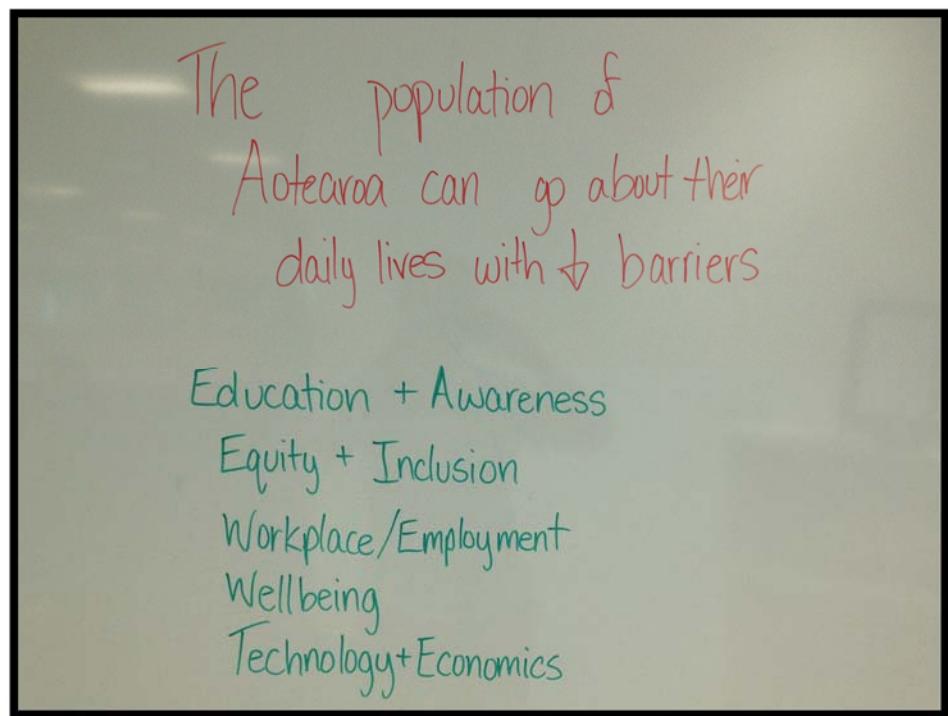


Figure 9. Photograph of the whiteboard to draft the future vision statement. Photographer: Elise Copeland, ©2012.

By the conclusion of the time allocated to this discussion, the group had not come to consensus. It was agreed that the vision statement would be ‘parked’ and reflected on over the following week and that the group would see it if could come up with a statement at the next meeting. Discussion of the vision statement continued online through email communication between meetings three and four, and the vision statement was revisited and finalised in the fourth meeting: “To achieve a society where products and environments are designed to enable optimal participation by all people” (Universal design research group, February 22, 2012). “Universal design research group” was proposed by one of the co-researchers during email discussion and was subsequently endorsed by all as a way of referring to the group.

### *Step 3 – Identifying action plans*

#### *Action*

Initially 21 action plans were brainstormed by the group, with group members adding and expanding on each other’s ideas. The compiled list was emailed or mailed to the group members as part of the summary of the third meeting (Appendix Q). Additional action plans were added to the list between the third and fourth meeting via email communications. Proposed actions were also added orally at the beginning of the fourth meeting, as co-researchers had the opportunity to identify additional opportunities

during the week, with a total of 25 plans proposed. Debate occurred regarding whether change can be effective coming from flaxroots<sup>4</sup> movements or whether it has to be initiated at an institutional level. Debate also occurred about whether disability needed to be reflected within the vision statement as those with disabilities may benefit to a greater extent from universal design than those without. Debate also occurred as to the benefits of having a vision statement at all. While it had been planned that the third and fourth meetings would be one and a half hours in duration, the enthusiasm and commitment to the project was such that all of the co-researchers agreed to extend the meeting times to two hours each.

#### *Reflection on action*

My reflection on the third meeting centred on the debates that occurred within it. Upon reflection, it was determined that the group was ‘storming’, a stage in group development where the group members have developed sufficient trust in each other to debate issues (Tuckman & Jensen, 1977). This was considered to be a good development, even though it is unusual within a search conference. In fact, within a search conference the opposite can occur, where group pressure is so strong that people find it difficult not to conform and they do not challenge each other’s ideas (Rehm, et al., 2002).

#### *Step 4 – Prioritising the plans*

##### *Action*

At the prioritising step, the group decides on the number of action plans to work on, based on what its members think they can manage. Greenwood and Levin (2007) suggested that the facilitator of the search conference take the brainstormed action list and group similar actions together, creating categories of actions. While I typed the action plan list and made it available to all of the co-researchers as part of the summary of the third meeting, I did not create categories of action items. A collective prioritisation process was implemented to choose among alternative plans (Rehm, et al., 2002). The prioritisation strategy was proposed by a co-researcher and agreed to by the group, based around the timing of the potential action plans. This is in line with the search conference method, which is about moving from the facilitator strongly guiding the process to the group members themselves guiding it (Greenwood & Levin). Those

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<sup>4</sup> Community development projects are sometimes referred to as ‘flaxroots’ movements in New Zealand rather than ‘grassroots’ (North Shore Community and Social Services, n.d.). Flax/harakeke is a plant with tall, green, sword-like leaves that grows throughout New Zealand and is important to Māori with many uses (Department of Conservation Te Papa Atawhai, n.d.).

actions that could be completed within the allocated three-month period were prioritised through open discussion and those that had longer timeframes or could be completed as part of research dissemination were proposed to be completed at a later date, dependent on the group's availability.

In this meeting I decided that the group would complete a skills matrix as suggested by Rehm, et al. (2002) to create a collective picture of the current skills and strengths of the group members in contributing to the proposed action plans. The co-researchers first listed essential skills required to make the action plans work. Then the group compiled a collective picture of the current skills within the group, volunteering their own and suggesting skills of others in the group, for example, writing, editing, preparing submissions, and oral presenting. Many in the group acknowledged skills in written and oral communication, which led to several of the action plans focussing on these strengths, while lack of knowledge and skill in economics was considered a barrier to one of the proposed action plans which was then not prioritised. Everyone in the group chose specific action plan(s) that they wished to work on. A total of 13 plans were agreed upon by the group members (refer to Table 6). At the conclusion of the meeting there was not enough time to discuss the co-researchers' findings of the universal design assessment of the Birkenhead Library. The group decided by consensus to have an additional two-hour meeting to discuss these findings, as well as their thoughts on the assessment tool itself. They also planned to discuss progress on their selected action plans.

Table 6

*Universal Design Research Group's Prioritised Action Plans*

Goal	Target organisation/audience	Format	Co-researchers
1. Add a universal design statement in the unitary plan	Auckland Council	Meeting and submission	Alexandra, Donald, Carol, Martine, Lisa
2. Promote universal design principles in wayfinding project and baby-friendly environments project	District Health Board	Meetings	Isis, Martine
3. Provide consultation on the Auckland Long-Term Plan	Auckland Council	Submission and oral presentation	Donald, Lisa, Carol
4. Provide consultation on the Land Transport Plan	Auckland Council	Submission and oral presentation	Donald, Lisa, Carol
5. Publication of universal design in magazines	Women's Health magazine and Parenting magazine	Article	Isis, Elise
6. Promote universal design through a guest column	New Zealand Herald	Article	Alexandra, Elise
7. Run a universal design workshop	Corporate sector, e.g. architecture firm	Workshop	Alexandra, Isis, Elise
8. Promote universal design in the Wider Journey Report	Human Rights Commission	Submission	Martine, Donald
9. Promote universal design principles at a conference	Health and Disability Conference	Oral presentation	Martine, Isis, Shirley
10. Promote universal design in tertiary education	Architecture, urban design, spatial design, engineering students	Meeting	Alexandra, Elise
11. Promote universal design to Diversity Practitioners	Diversity Practitioners Group	Meeting	Isis, Elise
12. Promote universal design in a new building or renovation	Auckland Council	Submission	Carol, Elise
13. Feedback on the Birkenhead Library	Architect, Auckland Council, Library Association	Letter	All
14. Upskill on universal design knowledge	Co-researchers	Reading, resources	All

### *Reflection on action*

Reflection on this meeting centred on the energy and enthusiasm levels within the group. The co-researchers appeared to be very energised to begin action planning. They clearly took the lead in developing the prioritisation process. However, as a consequence of my not having grouped the action plans into categories as suggested by Greenwood and Levin (2007), the group chose to progress 14 of the proposed 25 plans; I had concerns that this was potentially too ambitious. The request for an additional meeting was considered to be further evidence of the group's enthusiasm for this research project. Follow-up meetings to track progress are considered beneficial for increased learning opportunities and for creating collective ownership of the change process (Greenwood & Levin).

### *Step 5 - Initiating change*

#### *Preparation*

As this meeting was requested by the co-researchers, the agenda was proposed by email and mail to include a discussion of the findings of their assessments of the library and to review progress on the action plans to date. In preparation for this meeting, and as part of action plan 13, I completed preliminary analysis of the quantitative data generated by the co-researchers using the universal design assessment to assess the Birkenhead Library. Some of the co-researchers hand-wrote their responses; others filled out the forms electronically and emailed them to me. Refer to Appendix S for a sample of a completed page of an assessment by a co-researcher. Data were entered into SPSS 10 (IBM SPSS Statistics for Windows, 2010). The first step of this process was to define the variables associated with the demographic data of the co-researchers. These included sex, age, ethnicity, work status, household composition, and type of disability. Each variable was given a numeric value, for example female = 1 and male = 2. Then the responses to the universal design assessment questions were given the values yes = 1, no = 2 and unsure = 3. The data were then entered into the spreadsheet for each co-researcher (Pallant, 2010). The quantitative data were cleaned to ensure that there was no missing or incorrect information by reviewing each case a second time and using SPSS to recognise any blank cells as missing data. The participants' responses from the standardised assessment were scored using yes/no/unsure. The responses were counted and reported (types of usability problems and differences between the evaluators). The quantitative data from this study were solely used to enhance the co-generative learning process and to inform the feedback to the library stakeholders. The qualitative

comments that the co-researchers provided on the library assessments were also used in this way and were not analysed alongside the qualitative data from the transcripts. This analysis was provided to the co-researchers prior to the start of the fifth meeting and prompted further discussion and reflection.

#### *Action*

The last step in the search conference process is for the group to initiate concrete change activity and structure a follow-up process to share achievements and learning (Rehm, et al., 2002). This is the primary action phase of this research study. Once the plans had been decided upon in the previous step, it was up to the co-researchers to determine who was going to lead each project, whose assistance was needed, how they were going to communicate with each other, if they were going to meet again, what the next action steps were, and what the associated deadlines were (Flower, 1995). When I emailed and mailed co-researchers up to this point I had done so using blind carbon copy (BCC). Now that the co-researchers were taking the lead on various action plans, the group requested that the communication channels be clarified. On request from the group, I confirmed with each co-researcher individually which contact details they wished to share with the whole group; these details were then emailed or mailed out to all of the co-researchers.

At the beginning of the fifth meeting the group determined that they would discuss their findings of the assessment of the library and their thoughts on the universal design assessment as a tool for assessing a public building first. Some of the co-researchers reported that their findings were confirmed by the group, and others stated that they would assess the library differently if they were to go and assess it again following the group discussion. The collaborative discussions within the fifth meeting served to provide a framework for the summary of feedback on the universal design assessment of the Birkenhead Library that was sent to the various stakeholders that were involved in the library's design.

In the second half of the fifth meeting the co-researchers discussed their progress on the prioritised action plans. They reviewed the first six weeks of their three-month action phase of the study. The group reported that they had completed a number of the proposed actions, including promotion of universal design principles in two District Health Board projects, written submission on Auckland Council's Long-term Plan, written submission on Auckland's Regional Land Transport Programme, and written submission on the Human Rights Commission's Wider Journey Report. Refer to

Appendix T for a copy of the written submissions. During this meeting, new opportunities to promote universal design were identified by the group and several additional action plans were proposed, some of which were added to the list of prioritised actions based on group consensus; refer to the summary of the fifth meeting in Appendix Q.

A final follow-up meeting, meeting six, was planned for and convened in May at the end of the three-month action phase to reflect on the actions and to share achievements and learning. Some of the action plans were not completed due to changes in circumstances for example, action plan 1, the Unitary Plan consultation, was delayed by Auckland Council to 2014. Some of the plans were not completed as the opportunities did not arise; for example, action plan 12, as co-researchers did not identify notification of a new building/substantial renovation to a public building occurring within the action phase of the study.

Over the three-month action phase (March to May 2012) the group had enacted a number of the proposed action plans; refer to Table 7 for the list of actions that were completed, reported in chronological order. Co-researchers were more involved than anticipated in many of the completed action plans as some of the action plans were not progressed, making more time available to work on the remaining plans, and as the additional fifth meeting in April had given the co-researchers the opportunity to verbally contribute to and refine the actions.

Table 7

*Completed Action Plans*

Planned Actions	Completed	Co-researchers involved
1. Submitted on the Auckland Long-Term Plan	March 2012	All
2. Submitted on the Land Transport Plan	March 2012	All
3. Submitted on the Wider Journey Report	March 2012	All
4. Promoted universal design principles on wayfinding project with a District Health Board	April 2012	Martine
5. Promoted universal design principles on baby-friendly environments with a District Health Board	April 2012	Isis
6. Provided feedback on the Birkenhead Library	June 2012	All
7. Submitted an article to the New Zealand Herald	June 2012	All
8. Compiled resources on universal design	June 2012	Elise
Actions that Emerged	Completed	Co-researchers involved
1. Raised health and safety complaint with the library	April 2012	Donald
2. Raised health and safety complaint with a university	April 2012	Lisa, Shirley
3. Presentation to the Forum on the Land Transport Plan	April 2012	Elise, Isis
4. Presentation to the Councillors on the Auckland Long-Term Plan	May 2012	All
5. Presentation to the Planning and Urban Design Forum	July 2012	All

**Qualitative Data Analysis**

The primary source of qualitative data was the transcribed records of the search conference meetings with the co-researchers. These data were cleaned by listening to the audio files and correcting any errors or omissions to ensure accuracy and completeness of the transcriptions (Dijkers & Creighton, 1994). Qualitative data analysis commenced after the first search conference meeting: this is congruent with action research where the process of research is cyclical rather than linear, with data analysis informing the subsequent stages of action (McBride & Schostak, 2005).

Qualitative data were initially analysed using the NVivo 9 software (NVivo Qualitative Data Analysis Software, 2010), which assists with coding, managing, and analysing large volumes of qualitative data (Lennie, 2006). Inductive constant comparison was used to reveal emerging themes (Jones, 2002; Leech & Onwuegbuzie, 2011). First, an entire subset of data set was read, in this case a meeting transcript, with the codes initially specific and often using the co-researchers' own words (Leech & Onwuegbuzie, 2007). This involved the creation of 'child nodes', or short phrases of text, in NVivo; these were most frequently coded using 'Code In Vivo', which codes using the exact words/phrase from the transcript (Refer to Appendix U for an example

of child nodes). Then, I looked through the child nodes to identify nodes that were similar, reviewing the text that had been coded to each node (Leech & Onwuegbuzie, 2011). Parent nodes were created and named to encompass a number of the ideas captured within the child nodes; the relevant child nodes were then linked to a parent node (Refer to Appendix V for an example of parent nodes and associated child nodes).

Although parent nodes can be written as themes outside of NVivo (Leech & Onwuegbuzie, 2011), at this point in the analysis an additional process was undertaken guided by Dewey's concept of pragmatism. While initially the inductive coding process in NVivo appeared to be very productive, it became unwieldy. For example, from the fifth meeting alone I generated more than 200 codes. This process had me focussing too much on 'what' the co-researchers said rather than on the research question, which focuses on how'. Thematic analysis was then undertaken (Carpenter & Suto, 2008). A meeting transcript was printed with wide margins for recording categories. The transcripts were then re-read looking at larger chunks of data – whole paragraphs and pages – to cluster and amalgamate the categories to identify preliminary themes. The parent nodes, identified in the previous step, were explored alongside re-reading the transcripts and were expanded to uncover meaning, guided by my philosophical framework. Concept maps were employed to determine potential overlaps and linkages between the emerging themes (Carpenter & Suto); refer to Appendix W. Discussion and challenge of the themes took place during regular supervision sessions seeking alternative explanations for the findings. Questions were asked of the emerging themes, such as, "Are the themes and subthemes fully representative of the data?" Themes and subthemes were renamed to more accurately reflect the data. Finally, the transcripts were re-read and the themes finalised. For action research, the data analysis is a process of praxis. The analysis is developmental and dynamic, with the cyclical process continuing until an effective solution to the problem is achieved (Carpenter & Suto).

Direct quotes are used to give voice to the co-researchers using their own words and were selected to illustrate themes from the qualitative data (Greenwood & Levin, 2007). Feedback on the emerging themes and permission to use the specific quotes selected was obtained during a research dissemination meeting held on September 6, 2012 and through email and mail communication in March and August 2013.

### ***Audit trail***

My decision-making about the research and tracking of the research process was documented in several ways: in my reflective diary, in the written records of regular

supervision sessions, in reflections with co-researchers during the search conference meetings, and in communications with the co-researchers via email and mail including summaries of each meeting and presentations of preliminary findings. Table 8 documents the Appendices which constitute the audit trail for this study.

Table 8

*Appendices Documenting the Audit Trail*

Appendix	Description
Appendix P	Meeting plans
Appendix Q	Meeting summary documents
Appendix U	Example of the categories of inductive child nodes
Appendix V	Example of a parent and associated child nodes
Appendix W	Examples of deductive construction of themes
Appendix X	Example of a reflection following a meeting
Appendix Y	Member checking – Preliminary findings of the building assessment

# Chapter Six – Findings

*“It was the process that enabled me to learn... I’m sure that I’ve seen the universal design principles before, but unless you actually have to do something with it [you don’t learn]”*

(Martine, meeting 6, p. 33)

The findings are organised chronologically and reveal how users can influence universal design in the following ways: by forming a group, by using a tool, and by presenting their views. As described in the previous chapter, the findings are drawn from analysis of the data generated by the co-researchers using the universal design assessment tool, data collected in the search conference meetings, co-generative learning activities, and reflections on the process. An overview of the themes and subthemes presented in this chapter:

## Influencing universal design

### By forming a group

Broadening their perspective

- Building a shared perspective
- Entrusting each other with personal experiences
- Reflecting on the experience of others

Sharing knowledge, skills, networks, and resources

- Bringing personal skills and knowledge to the group
- Sharing networks and resources

### By using a tool

Enhancing learning of universal design principles

- Assessing tolerance for error
- Difficulty achieving all of the universal design principles all of the time
- Critiquing the principles
- Proposals for change

Being equipped to assess universal design

- The tool as a prompt
- Questioning the causes of poor usability
- Making use of staff

Needing access to a good universal design tool

- Good points about the assessment that don’t need changing
- Room for improvement
- Recommendations from the group

### Presenting their views

Gaining access to new networks

Reflecting on influencing change

Reflecting on change in governance

## **Influencing Universal Design By Forming a Group**

The analysis revealed that coming together as a group emerged as one of the ways users of public buildings can influence universal design. In coming together, knowledge and experiences were shared, with all of the co-researchers developing new understandings. There are two aspects to this process, represented in two subthemes: broadening their perspectives and sharing knowledge, skills, networks, and resources.

### ***Broadening their perspectives***

By forming a group the co-researchers became attuned to universal design issues and were motivated to take action. They learned from each other about all of the different perspectives that existed in the group and about each other's personal experiences. From that standpoint, they were able to reflect on and extrapolate this knowledge beyond the group. Subthemes within broadening perspectives are as follows: building a shared perspective, entrusting each other with personal experiences, and reflecting on the experiences of others.

#### ***Building a shared perspective***

In the first meeting, when working together to map out the context of the study, the co-researchers linked the global factors they identified to whether universal design would be taken up as a design philosophy within New Zealand. It was evident through the transcript that the co-researchers refined and added to ideas that were presented by others within the group. An example of this is the discussion regarding the economic context and its impact on the uptake of universal design. It was surmised that in a recession the government would be less likely to support initiatives that are seen to be more expensive than standard practice.

*I think the economic recession worldwide is going to have an absolutely enormous impact because immediately you're going to have people asking for anything new, you're going to have everybody despondently saying they can't afford it. (Carol, meeting 1, p. 14)*

*I think that's right – I think that equality would [be] one of the first things to suffer in times of recession. (Donald, meeting 1, p. 14)*

*Yes, definitely. (Martine, meeting 1, p. 14)*

The co-researchers also explored alternative possibilities when completing their environmental analysis. This demonstrates that they felt safe within the group to express different points of view. For example, some co-researchers stated that during an

economic downturn there is an even greater need for universal design as people with different needs return to the workplace in greater numbers.

*Financially in the economic downturn and things, more women are working and there are more mothers returning to work when their children are quite young and that can present all sorts of issues in respect to the workplace environments. (Isis, meeting 1, p. 16)*

*It seems important to universal design to think about, but it's this idea of welfare cuts. They put disabled people off benefits and into work, even though there are no [supports] and I think it will ultimately have a huge impact. Because it brings in economic ability to do things, but it also brings in the ideology stuff that you were talking about, the deserving/undeserving poor and disabled people are maybe seen as part of that whole beneficiary bashing and stuff. So again it has a philosophical, psychological, however you want to put it, effect... (Donald, meeting 1, p. 22)*

*It certainly has a fiscal effect. (Carol, meeting 1, p. 22)*

*It has a fiscal effect in terms of people... it ought to be more about disabled people[getting] around in public buildings, how are they going to get there. (Donald, meeting 1, p. 22)*

The growth of sustainability initiatives and ideas around improved participation and citizenship were discussed as aligning with universal design. Conversely, the current government was reported to favour less regulation; therefore, legislating for universal design in the current political climate was seen as unlikely. Technology was identified as a major area of change, and technological advances were identified as assisting the promotion of universally designed features. Refer to Appendix Q for the complete list of global influences identified in the first meeting summary. This session was beneficial in that the co-researchers became educators in the search conference (Rehm, et al., 2002), giving their perspectives on the systems that currently exist. Co-researchers were enlightened by the knowledge of the group as a whole and were informed about what is important when planning for the future and the context in which the action plans would be completed. For example, designers and architects were considered to be a specific audience that needed to be targeted in relation to universal design.

*I think we should be mindful of designers themselves, what kind of trends in the design world we know about [like] shared spaces... and think about the way designers are thinking, design trends and what philosophies they're being exposed to. (Alexandra, meeting 1, p. 20)*

*And the role of the expert. (Carol, meeting 1, p. 20)*

*Yeah. (Alexandra and Donald, meeting 1, p. 20)*

*I've been designing buildings for 50 years and I don't see why I should be doing it different. (Martine, meeting 1, p. 20)*

*(Laughter from the group.)*

*I think it ties in a bit with what Alexandra said. It's the notion amongst architects and designers I think, that accessible means somehow looking functional and therefore, it takes away some of the aesthetic beauty and you can't do both. I'm always amazed and quite perplexed – it upsets me a bit that most designers or architects don't seem to want to get around that and I'm challenged by this issue – why can't they make something beautiful and inclusive? (Donald, meeting 1, p. 21)*

Energy and commitment to the project was built through such lively and thought-provoking discussion. It was also evident throughout the transcripts that the group members appreciated each other's contribution to the knowledge generation process.

#### *Entrusting each other with personal experiences*

With the ground rules emphasising the importance of maintaining confidentiality and respecting each other's personal experiences, the co-researchers were invited in the first meeting to reflect on their own experiences of barriers and facilitators in public buildings. They shared reflections on a variety of experiences, including those in public buildings such as shopping malls, grocery stores, and university buildings, but also beyond public buildings, for example, public transport and private housing. Refer to Appendix Q for a summary of shared experiences in the first meeting. While the co-researchers were requested to share examples of barriers and facilitators, all shared examples of barriers only. They often spontaneously agreed with the barriers experienced by others in the group, which assisted in the rapport-building process.

*Every day, when I go to the supermarket... there's an issue if I take the pram which sometimes I just have to because I can't carry him and everything else, the turnstiles... they're an issue... I'm sure that other people find the same thing. Just when I go through with the pram, they hit him on the hands and as he gets bigger, probably the face. So that's something that I find incredibly frustrating. (Isis, meeting 1, p. 23)*

*My other [experience] is the supermarket as Isis just said. When I'm going to the supermarket – they have a trolley where I can connect it to my chair, but nine times out of ten it's filled up with other stuff and also going down the aisle, you can't go – hmm, hopefully someone will come along. But it's not easy. (Lisa, meeting 1, p. 26)*

In the meeting there were many murmurs of agreement and nodding of heads as each person shared their narratives. Through these observations of the group during the meeting and in my reflective diary, it was apparent that the co-researchers recognised

themselves in other people's stories and the environmental barriers that were faced. Acknowledging these shared experiences clearly assisted in group bonding. Personal experiences also evoked emotional responses that supported group consolidation.

*I can remember where I exactly was when I read my first Braille menu, when I was independently, ever first able to read a menu. I was in a Novotel in Wolverhampton in England and I was 25. That was the first time I was able to read a menu and order food without having to get someone I was with to do it or the waiting staff to do it. (Donald, meeting 1, p. 29)*

*Have you been able to do that many times since? (Isis, meeting 1, p. 29)*

*Not very often actually, which is quite interesting... never in New Zealand, except when I wrote the menus for the Association of Blind Citizens' Christmas dinner. (Donald, meeting 1, p. 29)*

In genuinely making this enquiry, Isis seemed to be expressing surprise that something taken for granted, being able to read a menu in a restaurant, was not a reality or regular occurrence for people that read Braille.

This sharing also appeared to heighten awareness of and attention to caring for each other's needs within the group. Group members frequently offered each other assistance during the course of the meetings, which included both practical and emotional forms of support. These included offering to bring the mugs and milk from the kitchen to the meeting room, offering to pour coffee for others, verbally describing what food was available and ensuring that each person had their preference given to them, providing guidance or assistance as to where the bathrooms were or exiting the building, and offering transport assistance to subsequent meetings for those that had arrived by taxi. One co-researcher spontaneously reflected at the end of the first session that she already felt she had learned about others:

*I just want to say that I think that I've already learnt some more about other people and the challenges that they might face, day-to-day things, things that I hadn't thought of and that's always a nice thing to come away with. (Isis, meeting 1, p. 40)*

#### *Reflecting on the experience of others*

Over the course of the six search conference meetings, it was evident that co-researchers were broadening their perspectives and demonstrating the ability to think outside of their own experiences. In the first two meetings the group thought of the environmental barriers experienced by friends or colleagues and shared these examples within the group. This assisted the individual co-researchers in thinking outside of their own

experience prior to assessing the Birkenhead Public Library. Following the assessments of both the building where the meeting was held in the second week and the library, co-researchers gave examples of barriers and reflected on how these barriers might affect the others within the research group. Following the assessment of the library, the co-researchers also proposed hypothetical scenarios where other people in the community may face barriers.

Co-researchers utilised the experiences of friends as a way to identify potential issues. This is in line with research that learning from personal experience can be direct or through observation of family, friends, or work colleagues (Iwarsson, et al., 2004; Ormerod & Newton, 2005). One co-researcher without impairment discussed difficulties with shelving.

*I have a friend in a wheelchair and I know that she has difficulty moving around [shelving]. Either she's in the way of other people or she can't reach certain things. (Carol, meeting 5, p. 3)*

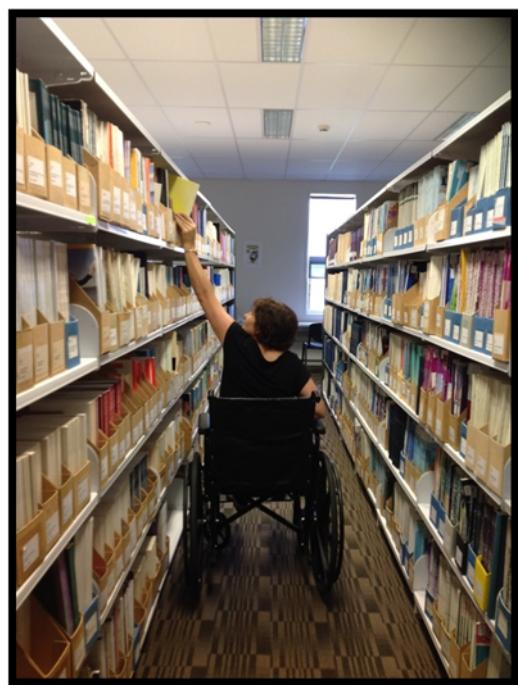


Figure 10. Reaching for a library book from a wheelchair. Photographer: Elise Copeland, ©2013

Another co-researcher who uses a single pram was able to ascertain difficulties for a double pram user.

*Because I have a number of friends who have double prams... if you had a side-by-side pram or even a long one, to get into a lift... you just couldn't get in and you probably couldn't get into the parents' room. (Isis, meeting 5, p. 6)*

As more time was spent together as a group, co-researchers began to refer to other members of the research group to identify where potential issues may arise. For example, an older adult without impairment commented to the mother of the young child about potential safety risks associated with the children's area being on the second floor of the library.

*If the children had run along to the other end of the floor there's no [gate]. (Carol, meeting 5, p. 5)*

*That's right, and then there's no door there either, exactly. (Isis, meeting 5, p. 5)*

In regards to an accessible toilet, a co-researcher with visual impairment commented that a co-researcher who uses a mobility aid may encounter difficulties.

*It wasn't an issue for me. Well, if I could find it, I could use it fine. Lisa would have had some real issues with it because of the [lack of] space. (Donald, meeting 2, p. 9)*

Through the research process, the co-researchers gained a heightened awareness of the difficulties that other members of the group may experience in other public buildings and spaces.

*I've found just when I'm going to a public place now... that I am really looking at things and thinking, how would Donald get along here, or what would Cosmo [the guide dog] do with this? (Isis, meeting 6, p. 34).*

Co-researchers also drew on their participation in non-governmental organisations as they broadened their thinking about barriers. For example, one co-researcher with visual impairment believed that the 'drive-through' option of the library may be beneficial for people with phobias.

*It's the first library where you can do a drop-off drive-through type service... some people don't like crowds. Even the Phobic Trust might even like that. (Martine, meeting 5, p. 10).*

Co-researchers also began to think of hypothetical scenarios where others in the community could face barriers.

*How on earth would you fit someone on a stretcher in that Birkenhead Library [lift]? (Isis, meeting 6, p. 4)*

*Well, you'd use an E-Vac chair. (Donald, meeting 6, p. 4)*

*I guess you'd have to go down the stairs or yeah, have a chair. (Isis, meeting 6, p. 4)*

This point was raised in relation to the forum on the Auckland Long-Term Plan. A paramedic at the forum supported the group's proposal of universal design in public

buildings, noting the significant difficulties that paramedics encounter when evacuating unwell patients from inner-city apartment blocks where lifts are too small to allow for stretchers.

### ***Sharing knowledge, skills, networks and resources***

Coming together as a group who had spent time together, committed themselves to a shared goal, and entrusted each other with their personal and political perspectives set the stage for the next mechanism by which the co-researchers could influence the universal design of public buildings. This involved the co-researchers making use of their personal skills and past experiences as well as sharing their professional networks and resources to achieve the group action plans. Subthemes include bringing personal skills and knowledge to the group and sharing skills, networks, and resources.

#### *Bringing personal skills and knowledge to the group*

From the very first meeting, co-researchers began to share their knowledge with the wider group. For example, several co-researchers had significant background knowledge about the UNCRPD (UN, 2006) and were invited to share this information with the group as a whole.

*I think from reading and discussions I have with other activists there is a bit of a growth around the Disabled People's Movement again. The UNCRPD has helped with that. (Donald, meeting 1, p. 14)*

*Donald, for those people in the room that may not be aware of the United Nations Convention on the Rights for Disabled – would you like to give a brief précis on it, or would you like me to do it? (Elise, meeting 1, p. 15)*

*UNC Rights for Disabled People – UN document, the first of the 21<sup>st</sup> century. The first UN Convention really written by disabled people themselves ratified by a lot of countries, New Zealand in 2008, covers a whole host of areas... it covers things like access... universal design, it covers areas you'd expect and things about education, standards of living. (Donald, meeting 1, p. 15)*

Such demonstrations of the expertise residing within the group supported my role as a facilitator of the group process rather than as an 'expert' to lead the group. This is consistent with the ascribed role of the search conference facilitator as providing an overall structure and tasks for the group to work through (Rehm, et al., 2002). It was evident that co-researchers took responsibility for educating and learning from others within the group and contributed their own personal skills and knowledge to achieve this.

Co-researchers shared their past experiences on ways to exert influence, including knowing the right people, knowing the system, and timing.

*Knowing who your people are, it's critical in this game. (Carol, meeting 6, p. 2)*

*Mike does the One in Five still? (Donald, meeting 4, p. 8)*

*Yes. He would still be the one to be in touch [with]. He doesn't do all the interviews... I know him quite well. (Martine, meeting 4, p. 8)*

Co-researchers implied that those with influence and power are more likely to get changes through and that for citizens to be effective in advocating for change they need to know who the key players are.

In the fourth meeting the research group completed a skills matrix (Rehm, et al., 2002) to identify the personal skills within the group that were needed to progress the group's action plans. That process was initiated by me asking the co-researchers what skills may be needed to progress the plans. As the discussion progressed, co-researchers took ownership of the process and began to suggest the skills that may be needed.

*It may be worth noting for things like the Long-Term Plan and the Land Transport Plan and possibly the Human Rights Commission submission, when we talk about not just submission skills, but oral presentation skills, who'd like to be involved. (Martine, meeting 4, p. 39)*

*I mean I don't mind talking, but I can't stand PowerPoint presentations and things like that to get information across. (Carol, meeting 4, p. 39)*

*Isis is offering to do a presentation. (Donald, meeting 4, p. 40)*

*I'm more than happy to be part of actually presenting the Human Rights Commission stuff for instance. (Martine, meeting 4, p. 40)*

The group utilised the completed skills matrix to assist in prioritising which action plans would be progressed over the three-month timeframe. In some cases co-researchers were working on different projects for the same organisation and took advantage of the opportunity presented by this study to promote universal design from different perspectives.

*I'll share one of Martine's. She's involved in a wayfinding project with [a local] District Health Board and she would like to have the opportunity to put out there the principles of universal design within that project. (Elise, meeting 3, p. 28)*

*I'm working with an organisation who got a contract to implement a pilot project for baby-friendly environment initiatives and they are working with public places to try to help make them more friendly... I*

*could talk to them about the principles of universal design. (Isis, meeting 3, p. 30)*

When drafting documents such as a submission, an oral presentation, or an article for the New Zealand Herald, the drafts were emailed and mailed to the co-researchers that volunteered for that action plan for feedback. Responses were collated by the leader of that action plan and then re-sent out to the group prior to submission. This process appeared to give the research group more ownership of the action plan than if a single person had developed and completed it on their own. Some of the drafts that were in progress were also discussed during the fifth meeting, giving the co-researchers the opportunity to provide oral feedback on the overall flow and intentions of the document or presentation.

#### *Sharing networks and resources*

In addition to freely sharing their knowledge and skills with the group, co-researchers drew on their professional networks to lend support to different actions that the group had prioritised. This was considered to be a key resource in achieving the action plans.

*What other key skills do we need to progress some of these action plans forward? (Elise, meeting 4, p. 36)*

*Well some of us have access to networks. I think we all have networks of various kinds. (Donald, meeting 4, p. 36)*

Some of the co-researchers shared lists of their networks online in a reference document so that leaders of each of the action plans could refer to it as needed.

Personal and professional networks were also apparent and utilised when the action of providing feedback to the library was discussed. Co-researchers drew on their knowledge of the various systems involved with Birkenhead Library and proposed that the feedback be provided at a variety of levels.

*I think if you cover the Local Board, if you cover the librarian services side, and if you cover the property side, then you've covered the service side, the property side, and the political side. (Martine, meeting 5, p. 29)*

Amongst the group of co-researchers, the names of specific individuals within these various systems were identified to whom feedback could be addressed.

The co-researchers shared resources such as documents and newsletters to facilitate their understanding of context, and later to enable the progression of their action plans. This assisted the group in forming communication channels and the flow of information between group members.

*I was thinking for those who want it I can send you out a link or an email attachment about the UN Convention and I can do it in various formats – large print or normal. I think that is the easy way, because it's a lot easier to understand. (Alexandra, meeting 1, p. 16)*

*Do you get the UN Enable newsletter?...[It is emailed] every two weeks and it tells you right in the first sentence who's ratified [the UNCRPD] and how many have ratified the Optional Protocol and it's amazing. (Martine, meeting 1, p. 16)*

Co-researchers shared information and resources acquired from their professional networks.

*When I send this group out the information about the UNCRPD meeting, I'll send you a copy of the CEDAW [Convention of Elimination of Discrimination Against Women] report as it currently stands. (Martine, meeting 6, p. 8)*

*That would be great. (Isis, meeting 6, p. 8)*

Unlike many search conferences, where each attendee chooses to work on one action plan (Rehm, et al., 2002), in this study co-researchers opted to work on multiple projects at once, sharing information and resources between the different projects. For example, the same introduction to the research group and explanation of how the universal design principles are applied was included within several different submissions as they were being drafted (Refer to Appendix T). This sharing of information and resources between the different action research projects appeared to strengthen the actions that were completed and also added to the cohesion between the group members and the projects.

The universal design research group's submission on the Auckland Long-Term Plan also informed submissions made by the professional networks to which the co-researchers belonged.

*The other thing in terms of the submissions... we can do is make our submissions available to other groups who we know will be submitting. So, for example, Martine and I have connections with the Auckland Disability Law and the Association of Blind Citizens... I always think it is good sharing your submission with other NGOs. Again, trying to get them to incorporate [universal design] ...in a number of [submissions]. (Donald, meeting 4, p. 8)*

*I put a submission in on the plan from Women's Health Action as well, and I used the information that was on your one, Donald, to put into ours as well. (Isis, meeting 5, p. 34)*

*Good stuff, fed into that one. Good. (Donald, meeting 5, p. 35)*

*Yeah, so that it fed into ours. And I also made sure that we put in the stuff about the accessibility of the plan. (Isis, meeting 5, p. 35)*

## **Influencing Universal Design By Using a Tool**

As discussed in Chapter Four, between the second and fourth meetings the co-researchers independently assessed the Birkenhead Library using a universal design assessment. This was an opportunity for experiential learning about the application of universal design principles in a public space that housed a service all of the co-researchers were familiar with. For the co-researchers to be better equipped to influence universal design in public buildings, the universal design principles embedded in the assessment were used as a way to learn about the concept of universal design. Three main subthemes are presented in relation to influencing universal design by using a tool: enhancing learning of the universal design principles, being equipped to assess universal design, and needing access to a good universal design tool.

### ***Enhancing learning of the universal design principles***

The majority of the co-researchers came to this study with a strong understanding of accessibility, and some with knowledge of universal and inclusive design. Actually using a tool that incorporates universal design principles was an important means of learning to apply those principles in real-life situations. It built on earlier experiences in the first meeting when, working in pairs or groups of three, the co-researchers generated examples of the universal design principles in public buildings encompassing signage, technology, and human assistance, among others. Refer to the summary of the first meeting in Appendix Q for the list of the examples of universal design that were generated.

The universal design assessment was then utilised as a tool for further learning about the universal design principles. When the co-researchers were presented with the Modified Task Scenarios (Appendix F), their response was an enthusiastic endorsement of learning universal design through doing.

*I've been at the workshops on universal design over the years, I have read the principles, but I've never had to use them in quite the concentrated way that we did, and I think that was really cool. (Donald, meeting 6, p. 35)*

Several factors appeared to concentrate the experience for the co-researchers. One is the immediacy with which they were asked to apply the learnings and discussion of universal design principles to an unfamiliar environment. Secondly, the co-researchers were in mixed-ability groups, so had the opportunity to discuss potential barriers and enablers in the environment from different perspectives. Having an objective tool also prompted the co-researchers to examine the public space from a variety of standpoints,

which promoted deeper analysis and discussion. Lastly, co-researchers appeared to benefit from the commitment that was required as part of the experiential learning process.

*The process [that] we actually went and worked with the tool to find [out] for ourselves was quite a lot, so I think that whole personal involvement and commitment was therefore there. (Martine, meeting 6, p. 28)*

#### *Assessing tolerance for error*

Through the assessment of the public building, co-researchers uncovered that one of the universal design principles, ‘tolerance for error’, appeared to be more difficult to assess. Although Yes/No were the only options provided, “Unsure” was written in four times on this principle, more than any for other principle. One co-researcher without impairment commented that tolerance for error was particularly difficult to assess if no safety issues were apparent in the area being assessed.

*I felt like I couldn't say no that there wasn't, or yes that there was tolerance for error, if I didn't have an error. (Isis, meeting 5, p. 19).*

Another co-researcher commented on their assessment that tolerance for error was

*difficult to judge properly, but I didn't encounter a problem, but then again, I'm blind, so would be blissfully unaware of hazards or signs of hazards; my guide dog... might have simply guided me around items, without me knowing about it (Martine, Universal Design Assessment, p. 1).*

From this, co-researchers learned that they would benefit from having further knowledge about this specific universal design principle, and that examples of this principle could be more difficult to generate as things may need to go wrong in order to know that there is a problem.

#### *Difficulty achieving all of the universal design principles all of the time*

By using the tool to assess the public building, the co-researchers identified that it was not always possible to achieve all of the universal design principles at once. The discussions regarding technology are provided as an exemplar. Technology was noted as requiring time and experience for it to become intuitive to use. Co-researchers provided examples from the library on technology and intuitive use.

*The front door that open[s] automatically, I really like the idea, but I didn't expect for it to happen. But, maybe for many people it is not intuitive that – I suppose it's getting [used] to the newest technology... not all of it is intuitive. (Martine, meeting 5, p. 11)*

So while the front door was rated highly by the co-researchers in terms of the universal design principle of low physical effort, it did not meet the principle of simple and intuitive use for all of the co-researchers. Co-researchers noted that with exposure over time to new technology comes familiarity, which makes the technology usable.

Another example comparing different universal design principles is in relation to security. Several co-researchers commented on how security concerns could make public buildings less accessible. In relation to the library they talked about the security scanners at the main entrance. The following interchange demonstrates how the co-researchers built upon each other's ideas.

*I did find the barriers at the front door were a hindrance when there was a lot of people coming and going. (Shirley, meeting 5, p. 8)*

*It did restrict what was a big, wide entrance, yeah. (Donald, meeting 5, p. 8)*

*You did feel like you were going through Customs or something. (Carol, meeting 5, p. 8)*

To access staff or restricted areas, swipe cards and number pads were mentioned as becoming more commonplace. Swipe cards were discussed as not meeting universal design principle number three (simple and intuitive use). Key pads may require two hands in order to operate the key pad and the door at the same time, therefore not meeting universal design principle number two (flexibility in use). However, it is noted that these technologies overall increased personal security and privacy, which is in line with principle number one (equitable use).

Co-researchers also discussed that while technology can make environments more usable, the technology needs to be designed with a wider scope of needs in mind. Several co-researchers noted that while an automatic opening is easier to use in line with principle number six (low physical effort), if the door does not stay open long enough, this can become a significant safety issue.

*I found that the lift doors closed too quickly. So that you barely had time to get yourself in or out if you were going to be manoeuvring yourself around. (Isis, meeting 5, p. 6)*

*We entered from the main entrance and I found the doors closed too quickly on me. (Shirley, meeting 5, p. 8)*

Technological refinements, such as sensors to tell whether someone is still in the doorway, were mentioned as a solution to this issue, which would meet the requirements of universal design principle number five (tolerance for error).

*The other thing about sliding doors, it's so great to walk through a sliding door and not having to open it... When you actually manually open a door, you've got the choice of how long it will stay open and whoever develops the sliding door will determine how long it will – unless there is a sensor in it that detects you, that you're still in the doorway, or if that sensor is high enough. (Martine, meeting 5, p. 16)*

Also in relation to designing for a broader range of needs, while the library provided free use of computers to benefit library users in line with principle number two (flexibility in use), the computers did not have software installed to enable them to be effectively used by users who are blind, therefore not meeting principle number four (perceptible information). From this co-researchers learned that technology is ultimately designed by people, and therefore, the design considerations can either enable or disable the user (Keates & Clarkson, 2003).

#### *Critiquing the universal design principles*

In addition to being a powerful way for the co-researchers to learn the universal design principles through small and large group discussion and reflection, the tool seemed to stimulate critical thinking about the principles themselves. As evidence of the deeper learning about the universal design principles, the co-researchers critiqued the lack of attention to context, that culture was not addressed, and that societal attitudes were not discussed. With respect to context, the co-researchers acknowledged that their expectations of a building would differ depending on the context. In the quote below, one co-researcher proposes that not all of the principles would have equal importance in every setting.

*Where does context fit here in terms of the purpose of a building and what you do in it? I'll give you an example: I went to my GP the other day. Now I don't need to know my way around my GP's because my GP comes out, shouts people's names, waits for them to come, and you follow him or he'll guide. In that building there isn't a need for anyone, really, to get themselves from A to B. You are always escorted by a GP or a nurse. Whereas in another sort of building, the purpose for which you use it is quite different. (Donald, meeting 2, p. 2)*

This insight is consistent with the notes that follow the text version of the universal design principles:

Please note that the Principles of Universal Design address only universally usable design, while the practice of design involves more than consideration for usability. Designers must also incorporate other considerations such as economic, engineering, cultural, gender, and environmental concerns in their design processes. (Connell, et al., 1997)

Culture, as part of context, defines our expectations of a building or space. From the first meeting, when they were introduced to the universal design principles, the co-researchers discussed the impact of culture with respect to public buildings. In the following quote a co-researcher speaks to how a building may or may not feel welcoming:

*How intimidating a building can be, because it's a place where you don't belong...one particular woman I remember...it took her five times before she actually made it up the steps and through the building...so my experiences of buildings like that is probably more cross-cultural and it's what the university represents to some people as a no-go area.*  
*(Carol, meeting 1, p. 27)*

Through their trial of the tool, the group also discovered that there is not a specific universal design principle that addresses culture, and hence its absence in the universal design assessment. They decided as a group that they may note cultural expectations within the comments section on the tool.

The discussion of the impact of culture progressed through the meetings; within the last meeting a co-researcher wondered whether Māori might have spiritual expectations of a building and how this may impact on universal design.

*I would have wanted to see possibly an aspect to do with that whole Māori culture mixed with universal design and almost spiritual things...we could always go and have a look...at a marae. (Martine, meeting 6, p. 31)*

As well as culture, the group decided that they might note the impact of attitude within the comments section on the tool, as attitudes are not specifically acknowledged within the universal design assessment or universal design principles.

*Say for instance that all this attitude or unawareness comes through, we put it in the comments because it is not reflected anywhere else, is that right? (Martine, meeting 2, p. 20)*

The group discussed how negative or unhelpful attitudes of others were a significant barrier to participation in public buildings; this is also reported in research literature (Imrie & Kumar, 1998; Kaufman-Scarborough, 2001; Rattray, 2007). In response to criticisms of the universal design principles, goals of universal design have recently been proposed (Steinfeld & Maisel, 2012). Refer to Appendix Z for the goals of universal design. These goals are noted to include 'cultural appropriateness' which includes consideration of the wider social and environmental context. The goal of 'social integration' has the ideal of treating all groups with dignity and respect; this can be linked to the impact of attitude on people's participation (Steinfeld & Maisel, 2012).

### *Proposals for change*

Applying the Task Scenarios and the group discussion that followed enabled the co-researchers to think about issues in the library more holistically and to propose ideas for change. For example, while the gate at the top of the stairs was noted on a number of the individual assessments, during the group discussion, the location of the children's area as being upstairs was raised and discussed as an issue. Safety concerns regarding potential for falls, accessibility issues regarding needing to access the second floor via the small lift, and the lack of suitable toilet facilities on the second floor were all discussed. The potential to shift the children's area to the ground floor was noted as a possible solution to the issues that were raised.

After only six hours together, the co-researchers were able to complete a thorough assessment of the library. Following the additional meeting, their collated results and feedback from their discussion were drafted, refined, and then submitted to the Birkenhead Public Library; refer to Appendix AA. Co-researchers discussed how the process of assessing the library and providing feedback was an effective way to learn about universal design.

*It was the process that enabled me to learn... I'm sure that I've seen the universal design principles before, but unless you actually have to do something with it [you don't learn]. (Martine, meeting 6, p. 33)*

Through group discussion and reflection on their findings, the group came to new understandings.

### ***Being equipped to assess universal design***

Having a tool stimulated the co-researchers to think through the details of assessing a building and to think critically in ways that they might not have done if they hadn't had a tool. The tool served as a prompt, assisted them in asking questions of the staff in the library, and incited them question the causes of poor usability.

Preparing to use the universal design assessment tool to assess the Birkenhead Library helped to clarify the co-researchers' questions about the Task Scenarios and to find ways to resolve some of their issues with the tool. The group agreed on the need to modify it to include the date, as it was pointed out within the group discussion that the assessment may be different depending on when it was completed. This amendment was considered necessary by virtue of having people with different abilities assessing and asking questions, which could feasibly cause changes to improve accessibility to be made in the building over the two-week period in which it was being assessed. The co-

researchers also sought clarification as to what is meant by ‘public amenity’ as compared to ‘obtaining a product or service’, which are assessed as different areas within the tool.

*I would argue that that's an amenity. It is an interesting one, the library, isn't it, because is the computer an amenity in the library? Or is it a service where you look up the catalogue? (Donald, meeting 2, p. 4)*

*And the front desk as well. (Lisa, meeting 2, p. 4)*

*Yeah, so front desk? Would we consider that an amenity or obtaining a product or service? (Isis, meeting 2, p. 4)*

*I think in a library you would only go to the front desk if you wanted something. So I think we could argue there that it is probably a service. (Donald, meeting 2, p. 4)*

As this interchange between co-researchers demonstrates, consensus was reached after discussion that ‘public amenities’ would include public toilets, public information, and computers, while ‘obtaining a product or service’ would include the front desk and the self-service checkouts. When looking at ‘circulation’ co-researchers also wanted to consider doorways, corridors, and hallways. Reaching consensus as a group not only equipped them with a tool they could feel confident using, it also assisted the group to feel more cohesive and, from the perspective of taking on the role of people who might influence universal design of a public building, might be considered to enhance the inter-rater reliability of the assessment process. For the full results of this building assessment, refer to Appendix AB. For the summary of the building assessment that was provided to co-researchers at the fifth meeting for discussion and member checking, refer to Appendix Y.

#### *The tool as a prompt*

When the co-researchers brought their individual findings together as a group a number of things occurred: they discussed additional barriers that were not recorded on their individual assessments, they reached a higher level of consensus as a group on what the significant barriers were, they explored some of the barriers in greater depth, and they discussed the potential causes and solutions. These points could equip the co-researchers to assess universal design in the future; writing a submission on a new construction was one of their prioritised action plans.

The group discussion of the assessments provided affirmation of ideas from others within the group and the discussion prompted new thinking about what they had seen and assessed.

*I found the meeting rooms were very small and after what you've said, Lisa...once you open the door you take away half the space and you think, could someone with a wheelchair or a pram or whatever come in here and then you can't leave the door open because you are right behind where the services [are]. (Martine, meeting 5, p. 10)*

*Tiny, isn't it. (Donald, meeting 5, p. 10)*

*Mmmm [murmur of agreement]. (Carol, meeting 5, p.10)*

Many co-researchers identified the same barriers to participation, but for different reasons.

*It's about the shelves and how near they are to the stairs...that prevents routes through easily. And not just for wheelchair users, but there were a number of places where I was being guided by someone and walking two abreast was actually problematic. (Donald, meeting 5, p. 2)*

Additional examples are cited in Appendix Y, such as the signage being reported as a frequent barrier. Lack of perceptible signage was reported by five co-researchers, while lack of line of sight or poor placement was reported by three. Similarly, facilitators in the environment were discussed in that they may benefit more than the 'intended' users. For example, they noted that computer software that enables users to interact orally with computers, while designed for those with low vision, may benefit users with literary difficulties or those that have difficulty understanding written information. Co-researchers were prompted to think more broadly than their own experience. They noted that other people may experience the same barrier as they do, or that other people may benefit from the same feature in a public building if it has been designed with the universal design principles in mind.

#### *Questioning the causes of poor usability*

In preparation for assessing universal design, co-researchers shared ideas on what can impact on usability. From the second meeting, co-researchers raised the idea that it is not always the design that impacts on whether a building or space is usable.

*That's the other interesting thing, Martine, you were saying last week about policy. You can have a space that is really well designed, but because there are no policies in place to help control how that space works, it is still not useable. (Elise, meeting 2, p. 7)*

*And that's really strong in the baby-friendly workplaces environment that we work in sometimes: you can have a room for parents and you can have this and that, but without the culture and the policy in place it means nothing. (Isis, meeting 2, p. 7)*

These preparatory discussions helped in applying the tool by prompting the co-researchers to question whether the impact on usability was due to the built structure of the building or decisions made after the building was constructed.

*So I don't think it's the building that's a key problem. I think where there are real circulation type issues, then I think it's about the shelves...that prevents routes through easily. (Donald, meeting 5, p. 2)*

Leaflets and general information on the walls were also pointed out by the co-researchers as being difficult to access.

*The information... was obstructed by a notice board. (Shirley, meeting 5, p. 9)*

*You mean those information bits at the front? (Donald, meeting 5, p. 9)*

*Yes, at the front. (Shirley, meeting 5, p. 9)*

*They were bizarre, weren't they? I mean, there was a bench in front of them. (Donald, meeting 5, p. 9)*

*We had a notice board in front of them, the day we went. (Shirley, meeting 5, p. 9)*

Another example was a lowered checkout desk available for wheelchair users or children, rendered unusable as it was covered in elaborate pamphlet displays. This is echoed in the literature where it was found that shopping environments could be made enabling or disabling based on the choices made by the retailer (Kaufman-Scarborough, 2001). From this experience co-researchers believed that universal design is not simply about getting into a building, but about being able to obtain products and services as any consumer would prefer.

#### *Making use of staff*

While the idea of asking questions of staff was not explicitly discussed in the preparation for using the Task Scenarios, the co-researchers were advised to use whatever strategies they would normally employ when visiting a public building that they had not previously been to. A number of the co-researchers used the opportunity to question the staff in relation to both universal design and ways in which the library promoted participation. The staff played a vital role in being able to successfully complete the tool.

Several co-researchers commented on the helpfulness of the staff, though noting that additional training could be beneficial. This is consistent with the literature that recommends staff training as a significant strategy to promote participation in public

buildings (Kaufman-Scarborough, 2001). One co-researcher posed a question to the staff at the reception desk about using a particular technology with the library's computer system and "she said she doesn't have a clue what I'm talking about" (Martine, meeting 5, p. 12). The receptionist then got the librarian on duty to provide assistance; the librarian was considered to be

*very helpful in that she from then on took me through to the lift and talked about some of the other online facilities they do have. (Martine, meeting 5, p. 12)*

Another co-researcher posed a question in relation to council information, part of the dual role of librarians, and stated:

*Ask the librarian that and she'll just look at you with glazed eyes... and that seems to me it's doing a disservice to the public. (Carol, meeting 5, p. 9)*

Co-researchers found that their original premise that attitudes of staff affect people's participation in public buildings was reinforced through doing the assessment of the Birkenhead Library. This view is supported by research literature (Imrie & Kumar, 1998; Rattray, 2007).

### ***Needng access to a good universal design tool***

Co-researchers felt strongly that a universal design assessment tool is needed for architects, designers, local authorities, and others to provide a way of assessing public buildings according to universal design principles.

*We need some push, some input around having a tool, a decent tool. Because it is a lack, it is a gap...there isn't really a tool to measure quite what [universal design] is. (Donald, meeting 6, p. 35)*

The group felt that existing building codes and standards are not aspirational and do not encourage innovation and best practice. The co-researchers discussed the utility of the Task Scenarios they trialled and provided a variety of recommendations for enhancing its usability. Three subthemes are presented in relation to strengthening the tool: good points about the assessment that don't need changing, room for improvement, and recommended adaptations from the group.

### ***Good points about the assessment that don't need changing***

As technology progresses and our expectations of buildings change, the co-researchers found that it is beneficial that the Task Scenarios allow for change over time. The co-researchers felt that the assessment could assess both current and emerging technology within a public building.

*You're going to make a mistake with new technology because it is not intuitive, but later on it will be best practice. So I'd rather talk about aspiration, like how do we move forward? Well, it's not intuitive, but will be hopefully easier to use, more technologically advanced, and so that's why it's aspirational. (Martine, meeting 5, p. 25)*

This may mean that a building feature may not meet universal design principle three initially (simple and intuitive use), but does meet other universal design principles such as one (equitable use) and six (low physical effort). Over time, the new technology may then become intuitive.

They also felt that it was beneficial that the tool was not number-based, in comparison to existing tools, such as the one employed by the Barrier Free Trust which is based on New Zealand legislation and standards. What is considered usable in a given situation may depend on the context rather than on a specific standardised number.

*There is a bloody problem measuring everything: is it exact, is it not. If it's not 570 mm high then it's wrong and actually it might be more useful in a particular case being 575 or 545, depending on use, what's actually happening. (Donald, meeting 5, p. 16)*

They felt that overall the Task Scenarios was a useful analytical guide and was comprehensive.

#### *Room for improvement*

The group had a number of criticisms of the Task Scenarios. The co-researchers found that while having five separate sections of the assessment prompted them to think about each area, this could cause assessors to need to revisit areas of the public building to ensure that they had captured all of the relevant information.

*You've got two approaches. Either you geographically take each bit of the building, so you take the entrance area and you check out bits there. And then you go inside, then upstairs or roundabout. Because the way this is laid out, you have to have more or less done the whole building before looking at the wayfinding. So that made it rather difficult... I think we agreed that it would have been easier to go – okay, here we are in the entrance bit, how does that go for being assessed. Okay, now we are in the next bit there. Otherwise you've got to assess the whole building first and then come back and start again. (Carol, meeting 2, p. 8)*

As they noted within the second meeting when they trialled the Task Scenarios, they found there was too much included in the category ‘amenities’. Amenities in this assessment include restrooms, information displays, public telephones, and seating units.

*I think the tool lumped a lot of things together, so in terms of amenities you had a whole host of things together there, which even if one – so if one had been okay, you had to make a decision whether overall to mark it yes or no. (Donald, meeting 5, p. 17)*

This point was discussed in that while those that design a public building may give little attention to ‘amenities’ while attempting to maximise ‘usable space’, the size and space for approach and use (universal design principle 7) of public amenities significantly affects the usability and experience that a person has within a public building.

A number of co-researchers noted that the Task Scenarios made the results seem more harsh, by only judging yes or no in meeting a universal design principle.

*I don't think the library was at all a bad building, but I think the way the tool's constructed, I gave it some very bad marks. (Donald, meeting 5, p. 1)*

*I think that you are right... I think my feedback probably judged the building more harshly than I could have. (Isis, meeting 5, p. 19)*

They stated that the Task Scenarios could not be easily provided to a building owner or manager, as there is no place to provide specific recommendations for what a builder or architect should do to make the building more universally designed or to add universal design features.

*If you use the Barrier Free tool where something either is or isn't accessible, depending on the legislation, I could go around a building and give my results then to a building manager and they would be able to get some sort of idea... I just wonder that if we were to give those sheets [the Task Scenarios] to someone who hadn't been to the building, I wonder what they'd make of the building and what they would then have to put right. And I don't think they'd have very much. (Donald, meeting 5, p. 17)*

*Yes. (Carol and Isis, meeting 5, p. 17)*

*And I think with a tool like this, that's a problem. If we want to see that part of this is about educating and about getting universal design implemented, I don't think someone reading our tool results would be able to go away and do very much. And I think that's a missed opportunity. (Donald, meeting 5, p. 17)*

They also felt that the assessment needed an area to provide feedback to the building owner, manager, or architect.

*It would be good to have something where you say – You're doing really well in this area, you're actually nearly there and by making a couple of small changes we can say that this particular area of your building is universal design (Isis, meeting 5, p. 19).*

There appears to be some conflict in the idea that the tool needs to be flexible, for example being able to capture emerging technology, while at the same time needing to be specific, in that concrete recommendations need to be generated.

Lastly, there was general agreement that the language employed in the Task Scenarios was unclear, that there was too much jargon, and that the questions were repetitive.

*I guess the writing of it set my teeth on edge immediately...I don't know why it is so over-written, I mean the best language is always the simplest and the most direct... And it was ambiguous as well, as you said that first one – do they make the design appealing to all users? Well, was that visually or functionally? (Carol, meeting 5, p. 21)*

*It does seem ironic, doesn't it, that something around universal design uses such bad jargon. Cobbler's kids wear no shoes and all that stuff, isn't it? (Donald, meeting 5, p. 21)*

Even one of the authors of the universal design principles agrees, stating that in terms of language they 'weren't very universally designed' (E. Steinfeld, personal communication, June 12, 2012). The goals of universal design (Appendix Z) were also developed with this criticism in mind.

#### *Recommendations from the group*

To influence the universal design of public buildings, the group proposed a number of changes to the tool to increase the possibility that others would use the Task Scenarios, both as a research tool and in practice. The desire to amend the tool could also be seen as providing a concrete outcome of the research project, whereas many of the other action plans were discussion-based.

They discussed that the yes/no answers to the questions were not helpful, as this led to generalisations. They suggested that either the yes/no be eliminated or a continuum be provided.

*Maybe the yes/no is not helpful. (Elise, meeting 2, p. 12)*

*Maybe it could be like a continuum. (Alexandra, meeting 2, p. 12)*

The co-researchers believed that the layout over five pages did not allow enough space for handwritten qualitative comments and that this space allocation should be greater. Aligning with their concern about jargon, they suggested that the questions be reworded for greater clarity. Additionally, one co-researcher found that it was easier to use the Task Scenarios in conjunction with the one-page handout of the universal design principles which has pictures and examples (Connell, et al., 1997).

Lastly, the group felt that for the assessment to be really valuable, it would be beneficial if there were both a summary section providing an overview of what the building is like and a recommendations section indicating what the building owner, developer, council officer, etc., could do to make the building more universally designed.

*I mean one of the things I do like about the... Barrier Free audits, is this - What needs doing now? What's medium-term? What's long-term? What do you do when you've got lots of money and you're doing a major [renovation] ... and this [assessment] doesn't have that...we need to be able to say to people with their buildings - Well, these are some of the recommendations, some of the things you could do. (Donald, meeting 5, p. 18)*

This criticism of the lack of recommendations informed how the feedback was provided to the library and other stakeholders. Refer to Appendix AA for the feedback that was provided to the library.

### **Influencing Universal Design By Presenting Their Views**

As discussed in Chapter Three, pragmatic action research is about consensus building, working with existing structures in society, and emphasising change in organisations through collaborative problem solving (Johansson & Lindhult, 2008). This research group came to consensus to raise awareness and promote the concept of universal design at a variety of systems levels – organisational, local, and national. They presented their views to local government bodies, professional conferences, commercial companies, and non-governmental organisations. The group primarily focussed on written submissions and oral presentations as their main methods of effecting change. Three subthemes emerged from the sixth meeting where co-researchers came together to reflect on the action plans that were progressed within this study: gaining access to new networks, reflecting on influencing change, and reflecting on change in governance.

#### ***Gaining access to new networks***

A number of written submissions were completed as part of this action research study. This included submissions on the Human Rights Wider Journey's discussion document, the Auckland Long-Term Plan and the Auckland Transport Plan (Appendix T). It was evident that by writing these submissions, further opportunities arose. The co-researchers supported each other to act on these opportunities, which enabled their actions to continue to progress over time. This appears to be the power of a group, the continuing energy and support for change. For example, through the submission on the Human Rights Wider Journey's discussion document, the group was invited to attend a

Human Rights event to discuss New Zealand's progress on the UNCRPD. Through submissions on both the Auckland Long-Term Plan and the Auckland Transport Plan, the group was given the opportunity to present orally to Auckland City councillors. Through such a presentation, the group was invited to present at the Urban Planning and Design Forum. This enabled the group to have access to new and influential audiences to promote the concept of universal design and to present the research that they had collaboratively undertaken.

*Yeah and there's also the thing where Cameron Brewer is, isn't there?  
The Planning [and Urban Design Forum]. (Donald, meeting 6, p. 1)*

*Yes, which I've got a date for as well, a provisional date. (Elise, meeting 6, p. 1)*

*And that's the important one...he's a councillor with quite a lot of influence. (Donald, meeting 6, p. 2)*

This is in line with literature that states that action plans continue to progress and evolve as the process continues: "You don't know where you'll end up. It is an adventure" (Rehm, et al., 2002, p. 43). Refer to Table 9 for the research dissemination activities that occurred as part of this study.

Table 9

#### *Research Dissemination*

Research Dissemination	Completed	Co-researchers involved
1. Presentation to the Universal Design Conference, Oslo, Norway	June 2012	All
2. Presentation to the Occupational Therapy Conference, Hamilton, NZ	September 2012	All
3. Presented to the National Foundation for the Deaf, Auckland, NZ	October 2012	Alexandra, Elise
4. Presented to a New Zealand engineering Firm, Auckland, NZ	October 2012	Elise, Alexandra
5. Presented to the Gender and Diversity Research Group, AUT, Auckland, NZ	February 2013	Elise
6. Presented at the Auckland Universal Design Conference, Auckland, NZ	May 2013	Martine
7. Presented at a Barrier Free Workshop – Barrier Free Trust and Blind Citizens NZ, Wellington, NZ	August 2013	Martine

### ***Reflecting on influencing change***

In addition to the support received through the group, the co-researchers collaboratively decided on which formats were likely to be influential. They discussed that oral presentations were needed as they lend further weight to the written submissions.

*You always tick the box ‘Yes, I want to be heard’... They’ll always tell you, ‘You don’t really need to [orally present] and we do read it and all that’, but we all know from the past that being there on the spot and saying – ‘Hey, look here, this is what I’m saying’ [is important]. (Carol, meeting 6, p. 10)*

Available guidelines also stated that oral submissions provide the opportunity to reinforce the message of a written submission (Office of the Clerk of the House of Representatives, 2012). This sharing of insights enabled the group to effectively engage in political and social processes to stimulate change. In line with advice received from a policy analyst, the verbal presentations contained many of the personal narratives of the co-researchers, examples of barriers experienced in public buildings and in using transportation to highlight the need for universal design.

*I’ve drafted [the oral submission on the Auckland Transport Plan] on the basis of some of the stories that were shared during that first week. So, for example, the story about getting stuck on the train that almost went to nowhere, when she didn’t have her hearing aids working...these are some of the experiences of people when transport isn’t accessible. (Elise, meeting 5, p. 35)*

This method is supported by literature (Hughes & Calder, 2007). Refer to Appendix AC for the transcript of the oral presentation to Auckland councillors regarding the Auckland Transport Plan.

### ***Reflecting on change in governance***

The change in governance of Auckland was discussed in some depth when the co-researchers came together to reflect on the action research process. The change to a supercity predicated a change to the oral presentation process which follows a written submission. Co-researchers felt that the change from a verbal presentation to a panel of councillors to a forum, where a group of presenters sit around a table with one to two councillors, to be of concern. Concerns raised included not being able to sit at a table with presenters raising similar issues, which meant that your issue could get ‘lost’ in the discussion; not having the ‘right’ councillor sitting at your table, one that understands the issue that you are speaking to; and the discussion around the table not being adequately recorded.

Donald reported to the group on feedback that he received from another group that had also attended the forums on the Auckland Long-Term Plan:

*We got feedback from the Association of Blind Citizens who this time were involved in the forum. And it's interesting that while [the Association] quite enjoyed that, the feedback was – we're talking to the few people who happen to be around your table rather than getting the chance to talk to all the councillors. (Donald, meeting 6, p. 2)*

*There's some real warm fuzzies at that forum...but you do get the feeling that the information is just being disseminated into the air. (Carol, meeting 6, p. 3)*

*The forum really depends on the council [member] you happen to have at your table. (Donald, meeting 6, p. 3)*

*Yes. (Isis, meeting 6, p. 3)*

It was also noted that there was decreased participation in the process. Many of the people who submitted and indicated that they would like to orally present their submission did not attend when they were notified that the process would be a forum.

*Apparently out of the 1,600 people that offered to give oral submissions at the Auckland Long-Term Plan, only 900 showed up. (Elise, meeting 6, p. 26)*

*Well, a lot of people, when they found out that it was a group thing, said – waste of time. I know two people who did that. (Carol, meeting 6, p. 26)*

There was fear among the research group that this change to a forum format was precipitated by a need for expediency, but that the end result would be that oral presenters would have less impact on Auckland Council decisions. This led to an overall discussion of the impact, or lack thereof, of submissions on strategic directions taken by local and national government.

*Do people get dismayed, just put off going through the public submission process because you so often can't see where your work shows up in the rollout of these plans? It's just like all of the consumer consultation that is done in our work and in health and you get these huge big documents coming out from the Ministry and search for anything that has any resemblance on the work that you did in a wide group from many stakeholders – do they just tick their box and say that they consulted, or is it, does it actually meaningfully contribute to something? (Isis, meeting 6, p. 27)*

However, the group believed that it was still important to exert their democratic voice on these issues, and used the opportunities for both written and verbal submissions.

They boosted confidence within the group by sharing some of the more positive experiences that they had had with respect to submissions.

*The submission on the Wider Journey report has [been submitted].  
(Elise, meeting 5, p. 36)*

*And we've received [acknowledgement]. (Martine, meeting 5, p. 36)*

*They're not taking oral submissions are they? (Donald, meeting 5, p. 36)*

*No. But what they do sometimes, because they've actually got back to me about a prior submission I made two years ago about local elections, the Human Rights Commission [asked] may they use my submission [from] two years ago, for some examples. So they do keep stuff and then use it again. So it's not just oh, this will go in a drawer somewhere. (Martine, meeting 5, p. 36)*

The group felt that it was important to have their say on issues that were important to them and would continue to do so, despite changes in governance. They acknowledged that the ways in which their voices would be heard may be different now and into the future.

### **Summary**

The findings in this study demonstrate several ways that coming together as a group provided a powerful mechanism for the co-researchers to collaborate to influence the universal design of public buildings. They developed and shared new knowledge and networks over time, they developed experiential knowledge of universal design by using a universal design tool to assess a public building, and they presented their views collaboratively at organisational, local, and national levels to raise awareness of the concept of universal design.

# **Chapter Seven – Discussion**

*“I certainly feel I’ve participated, rather than just being consulted.  
I’ve had a say in the direction of the whole thing.”*

(Donald, meeting 6, p. 29)

## **Discussion**

This study set out to answer the following question: How can users influence the universal design of public buildings? Pragmatic action research was the methodology employed to answer this research question, in which the co-researchers were actively involved and engaged in the research process and knowledge was generated through action and experimentation (Boog, 2003). The method utilised in this study was that of a modified search conference, based on the writings of Greenwood and Levin (2007) and Rehm et al. (2002). As an integral part of the method, the co-researchers assessed a public building using the Task Scenarios developed by Afacan and Erbug (2009). They brought their collected data together and engaged in discussion to deepen their understanding of universal design in a public building, as well as to support their action of sharing their assessment results with the building stakeholders including its owners, designers and managers. This chapter discusses the three main findings of how the co-researchers influenced universal design: by forming a group, by using a tool, and by presenting their views, drawing on recent literature and Deweyan philosophy to deepen understandings.

## **Collaboration and Partnership**

This study has demonstrated how bringing a group of users together may be an effective means of influencing the universal design of buildings. A diverse group of individuals endeavoured to promote the concept of universal design through planning and action, collaborative discussion, and reflection. Meeting as a group over a number of months enabled the group members to share their individual skills, knowledge, and resources with the wider group and to have their ideas for change supported, extended, and presented.

### ***Forming a group***

By coming together as a group, the co-researchers in this study solidified the belief that to achieve greater participation in public buildings and spaces, social change is required from both the bottom up (flaxroots movements) and top down (national government

policies). The group began its flaxroots movement by uncovering and deepening their understanding of barriers and facilitators in a public building. The universal design assessments of the Birkenhead Public Library, completed individually by each co-researcher, exposed a number of barriers and facilitators according to the universal design principles. When the co-researchers brought their individual findings together as a group, a number of things occurred: they shared their perspectives of barriers and explored some of the barriers and potential solutions in greater depth through shared reflection and respect for each other's knowledge, skills, and resources.

The findings of this study are in line with recent literature that reports building users in particular are able to highlight facilitators and barriers to accessibility in public buildings (Hammel, et al., 2006) and public spaces (Ripat, et al., 2010), with this study suggesting that being in a group amplifies this capacity. While several studies have indicated that diverse individuals are able to uncover a greater number and variety of barriers in public buildings than a single individual on their own (Afacan & Erbug, 2009; Luck, 2003), only Gossett et al. (2009) alluded to the notion that coming together as a group is beneficial in deepening understandings of barriers that are faced.

Consistent with those assertions, and even though the Birkenhead Public Library has won a number of design awards (Libraries Ngā Whare Mātauranga o Tāmaki Makaurau, 2011), the co-researchers in this study were able to identify a number of areas where the building did not meet universal design principles. However, the collaboration and reflection that was a critical component of collaboratively applying universal design principles in this study has not been described in previous research studies.

To establish partnership with the co-researchers, it was essential to build trust in each other as a group. It was important to establish a shared vision of the future, for each person's views to be acknowledged and valued, and for the co-researchers to take ownership of the process, openly share knowledge and experiences, and have good personal relationships and respect for each other. This is congruent with Dewey's concept of democracy (Dewey, 1944), ensuring that all of the co-researchers were enabled to participate in the research process. Partnership with end users of public buildings can be seen as a continuum – from simply providing information, to consultation, through to collaboration and community decision-making. See Figure 11 below.



*Figure 11.* Levels of participation. Source: Office for Community & Voluntary Sector Tari mōte Rāngai ā-Hopori ā Tūa-o, n.d.. Reproduced with permission from the Department of Internal Affairs Te Tari Taiwhenua, New Zealand Aotearoa.

Co-researchers reported that this study engaged them beyond a consultative level:

*It's been really great how you have sought to actively involve us all on an equal platform, in terms of being co-researchers and encouraging us to be actively involved in spreading the word about the research, so more than an advisory group participant platform... you're not just getting our perspectives on things, you're actually getting us to assist with trying to develop the understanding of universal design. (Isis, meeting 6, p. 28)*

*We were co-researchers – you didn't just consult with us... we had to do some of the drafting of submissions and things like that, so I think people took more ownership of the process. (Martine, meeting 6, p. 28)*

*Everyone put into the direction... through the process we've all led and done things that we've brought together... for me, it's not been about consultation, I think it has been much more about participation. (Donald, meeting 6, p. 29)*

### ***Presenting their views***

While collaboration and partnership were essential principles within the research group, the ideas of collaboration and partnership extended to partnering with the wider community. When the co-researchers enacted their action plans, how, when, and to whom they presented their views were significant points of discussion.

The findings of the study suggest that not involving users early in the design process affects the extent to which they can influence the universal design of public buildings. Szenasy (2011) argued that designers need to engage with communities to find out what their existing skills and resources are and then involve them in creating their own environments. As the response from the principal architect of the library made clear

(refer to Appendix AD), many of the issues raised by the co-researchers in relation to universal design were structural, and therefore were unlikely to be addressed or rectified now that the building is complete. This finding is consistent with the study by Ormerod and Newton (2005), where it is recommended that consultation with building users occur early in the design process – these authors suggest as early as the briefing stage. Once a building goes out to ‘notification’, the design is essentially complete and this removes the opportunity for structural changes in line with universal design theory. However, as the co-researchers expressed, it is difficult to find out and contribute to design early in the process. Accordingly, the co-researchers expressed dissatisfaction with consultation as a process:

*As a society, and especially in Auckland at the moment, people get tired of just being over-consulted and then two years later someone comes and asks them the same questions. (Martine, meeting 6, p. 28)*

This dissatisfaction was particularly the case when consultation occurs at a late stage, when the design of a public building is nearly complete. Grassroots involvement of stakeholders from the beginning of the design process has also been recommended as an outcome from a previous qualitative case study (Gossett, et al., 2009).

In addition to consultation with building users occurring too late in a building’s design, consultation with disabled users frequently does not occur at all (Ormerod & Newton, 2005). It is important that the diversity of a given population be reflected within the group that is consulted with. However, extending from the current literature that discusses consultation with building users (Gossett, et al., 2009; Hammel, et al., 2006; Ripat, et al., 2010) is the notion of partnership with building users to improve the universal design of public buildings.

In New Zealand, policy and legislation requires participatory and partnership processes above those that are simply consultation (Office for Disability Issues, n.d.) These ideas are linked to Dewey’s conceptualisations of democracy. According to Dewey, democracy involves all levels of society being actively involved and not privileging the voice of experts (Dewey, 1944). It is important that decision-making by ordinary citizens not be reduced to tokenism (Evans, 2000). The co-researchers expressed concern that democracy was being devalued with the change of governance structure and feedback mechanisms that were occurring in Auckland at the time of this study.

## **Experiential Learning and Reflection**

With respect to contribution to knowledge there are two findings that do not appear to have been reported in the research literature to date. These are the benefits of experiential learning as a process for learning about universal design in public buildings and for applying that knowledge to specific action plans, and the power of reflection as part of a search conference process.

### ***Using a tool***

The co-researchers in the study noted many benefits from experiential learning as a way of learning about universal design and how to apply the universal design principles. Experiential learning, as defined by Dewey (1944), involves active occupations with a social aim. The co-researchers found that they were more engaged and committed to their process than they had been after attending workshops on accessibility in the past. They found that they were able to articulate their findings about the universal design assessment of the library and about the tool with greater confidence. They were also able to draw on their experiential learning as a way of communicating the need for change in promoting universal design. As the co-researchers found the experiential learning to be particularly helpful as a way of learning about the universal design principles, a similar process was completed during the research dissemination phase. When requested to present the findings of the study to a large international engineering firm in Auckland, the study was introduced, followed by an experiential learning process.

The participants at the seminar were provided with the Task Scenarios, which had been modified with the feedback from the co-researchers in this study (Appendix AE). In small groups they were instructed to assess their own building according to the universal design principles. The participants appeared to be enthusiastic with the process and reported that it opened their eyes to many existing barriers, some that were obvious and some that had remained hidden until they used the tool to uncover them. They reported that taking the time to examine their surroundings was a very valuable learning experience. As a result, several participants planned to notify building services and their management team to address the issues that were raised.

### ***Reflecting***

A second new finding is the power of the reflections of the co-researchers as part of a search conference. In action research, there is a significant focus on the reflective processes of the researcher (Herr & Anderson, 2005); however, there is often little

mention of reflection by the co-researchers as part of the action research cycle. It was very evident during this study that the co-researchers continued to reflect on their previous actions both outside of the formal meeting times, often through email communication, and at the beginning of each of the meetings. These reflections then changed, guided, and further informed the actions as they progressed. Several co-researchers commented on the benefits of having time to reflect.

*I can imagine how I felt when I went to the library that you could be very critical and not have time to reflect on what was good, because you're there specifically, probably at that stage almost, looking for what's wrong. Even though that's not how it's supposed to be. (Isis, meeting 6, p. 37)*

*When you do this intense thing, it doesn't work because it does not allow people to reflect. It's impossible for people to take concepts in, consider them and things in that pressured environment... when you've had a whole weekend of that sort of stuff, I don't think it really achieves. (Carol, meeting 6, p. 37)*

Reflection enabled the co-researchers to think about ways that they have identified problematic situations in the past and to uncover habits that they have developed to solve these situations (Cutchin, 2007). Dewey defines habits as “an acquired predisposition to ways or modes of response” (Law, 2002, p. 40). Habits involve the support of the environing conditions. This appears to be the reason that the co-researchers predominantly chose submissions as a means of promoting the idea of universal design. They had previous experience in writing submissions, and the timing was such that the plans were open to public response. While the co-researchers acknowledged that the change to the supercity may decrease their democratic voice, they relied on this previous habit as an action to achieve change.

*Donald and I are both – we're sort of professional activists, in a way. I mean mine comes from having a family background like that where you're always taught that if there was nothing there you'd better do something about it. And I guess it's also we must have a sort of a belief that it's worthwhile, Donald. (Carol, meeting 6, p. 38)*

*Yeah, I guess so. Otherwise I'd stop. (Donald, meeting 6, p. 38)*

*Even though we don't have that many wins, I know myself with these things; somehow we must believe that it's worth [it]. (Carol, meeting 6, p. 38)*

*Yeah, I do believe that, yeah. (Donald, meeting 6, p. 38)*

*I think if we can make a difference to one person, then it's worthwhile. Because then it makes the difference, you know, the whole ripple effect. (Isis, meeting 6, p. 38)*

When no habit was available to guide their choices (Dewey, 1938/1986), the co-researchers collaboratively brainstormed ideas as a group to come up with a new way of dealing with a problematic situation (Cutchin, 2007). For example, co-researchers posed hypothetical scenarios as a way to illustrate or identify potential issues in the library. Coming together as a diverse group enabled them to explore these issues in a wider sense. Achieving better universal design appeared to be facilitated by the group discussions and reflections. Co-researchers came up with a number of proposed solutions to design barriers as they were discussing the barrier. One co-researcher, who is blind and had walked through the library side by side with someone who is sighted, pointed out that the narrow passageways between the shelving might be able to be changed by rotating the orientation of the shelving by 90 degrees. Another suggested that the children's area of the library be relocated downstairs to facilitate access for those unable to use the small lift, such as mothers with double prams.

### **Process and Pragmatism**

The findings of this study support the shift in thinking that is occurring internationally to conceptualise universal design as a process rather than an end stage to be achieved. This shift in thinking is reflected in the new definition of universal design proposed by Steinfeld and Maisel (2012) – “a process that enables and empowers a diverse population by improving human performance, health and wellness, and social participation” (p. 29).

Universal design can be said to be idealistic (Steinfeld & Maisel, 2012). The critique that it “can’t be all things to all people” is a significant barrier in achieving universal design (Gossett, et al., 2009; Tokar, 2004). The co-researchers noted that achieving all of the universal design principles at the same time can be problematic. However, what the co-researchers have discussed and acknowledged in this study is that universal design needs to be viewed as a process rather than an end state, and that pragmatism is needed in achieving workable design solutions. In the sixth meeting the co-researchers were discussing a walkway in Auckland that was not accessible to some potential users and that attitudes can be an impediment to that goal.

*Around Takapuna and Milford there's a rock walk between the two beaches. [It] has been suggested that it should be made to be accessible for all, which would then be pushchairs, wheelchairs, bicycles, everything, but it then would not be what it is, because to do that you'd have to create a concrete walkway which would no longer be a rocky climb. (Carol, meeting 6, p. 19)*

*I think that is the issue isn't it. I think you make these things as accessible as they can, but no one is suggesting that the countryside get flattened and become tarmac so that wheelchair users can go along it. I mean, it's a balance isn't it? (Donald, meeting 6, p. 19)*

*Sometimes it's hard to know where they're going on this. (Carol, meeting 6, p. 19)*

*Sure. I think for me it's always as far as you can and then a bit further. If it started off that that was the attitude I'd be quite happy, but the attitude normally starts – Oh, we can't do this. (Donald, meeting 6, p. 19)*

*And then you've got to push to say – Yeah, it can be done. (Isis, meeting 6, p. 19)*

“Idealism detached from action is just a dream. But idealism, allied with pragmatism, with rolling up your sleeves and making the world bend a bit, is very exciting, is very real, is very strong, and is very present” (Bono, 2005). This is how real change can be achieved. When viewed as a process rather than an end state, one where pragmatic and incremental improvement in design occurs over time, the barriers to the walkway being used by a wide variety of users could be broken down into smaller, more achievable steps and targets. This is reflected by Greenwood and Levin (2007) who advocate that pragmatic solutions are those that are the best possible ones at that moment in time given the resources at hand. Incremental improvement is also suggested in the preamble to the book Universal Design New York 2 (Levine, 2003) with the statement “a universally designed building or site is as much about becoming universally usable as it is about being universally usable. There are always improvements that can be made” (p.14). Achieving pragmatic solutions is also linked to how the Inclusive Design Toolkit “Exclusion Calculator” (Inclusive Design Toolkit, 2013) is formatted – to demonstrate to designers how many people are excluded from their design, and therefore, how many more people could be enabled to use a particular feature if it were changed to encompass a greater diversity of users.

Co-researchers in this study showcased their pragmatism through their action plans. For example, in their feedback to the library, they provided their recommendations in three stages – short term, medium term and long term. They were aware that the ideas presented under long term were significant and potentially costly and discussed that these changes were unlikely to be completed unless the building itself underwent a major renovation at some point in the future. If universal design is viewed as a process rather than an ‘end’ to be achieved, it can be more easily managed steps of incremental improvements, rather than dismissed as unattainable.

## **Strengths and Limitations of this Study**

Recruitment of advocates is considered to be both a strength and a potential limitation of this study. Advocates were specifically recruited as the time commitment for this study was significant, and it was hoped that advocates would be passionate about enabling change. One of the strengths of this study was that the group that became co-researchers were particularly well-informed with respect to accessibility and disability issues. A number of the co-researchers in the group had previously completed Barrier Free training (BFNZT, 2013), several had in-depth knowledge of the UNCRPD (United Nations, 2006), and one co-researcher had completed a Master's degree in Disability Studies. Many of the co-researchers also had employment which gave them many connections to community groups and organisations. As a result of having a well-informed, well-educated, and well-connected group of co-researchers, it is possible that the actions and process of this study would not be replicated in another group of diverse community members, both in terms of the volume and the nature of the actions that they committed to.

A second limitation with respect to recruitment, was the lack of representation of all of the relevant stakeholders with respect to universal design in public buildings. This is linked to the size of this study and the number of co-researchers that were engaged in the process. Different authors promote an ideal group size for a search conference of 20 to 40 (Greenwood & Levin, 2007) with up to as many as 64 participants (Weisbord, 1984). A larger search conference better allows for representation from all of the relevant stakeholders. The co-researchers in this study identified that having diverse stakeholders present, particularly those with power to influence change, could have had a very beneficial effect on the action plans to promote universal design.

A third limitation with respect to recruitment, was the relative lack of cultural diversity within the group. While the group did have some cultural diversity with co-researchers from New Zealand and from outside of New Zealand, there was no tāngata whenua<sup>5</sup> representation within the group. As acknowledged by a co-researcher, the lack of a Māori co-researcher meant that an alternative cultural viewpoint of the indigenous people of New Zealand Aotearoa was missing. While discussions were held with a Māori advisor to seek understanding of some of the cultural differences that may apply to public buildings and documentation was reviewed in relation to housing as suggested

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<sup>5</sup> Tāngata whenua: local people, hosts, indigenous people of the land; people born of the whenua, i.e. of the placenta and of the land where the people's ancestors have lived and where their placenta are buried (Māori Dictionary: Te Aka Māori-English English-Māori Dictionary, 2013a).

(Hoskins, Te Nana, Rhodes, Guy, & Sage, 2002), this cultural perspective was not discussed in depth within the research group itself. The co-researchers also noted that it would be very difficult to represent a wide range of cultures within a small group and that individuals of the same ethnicity may have very different views on public building design from a cultural viewpoint.

Recruitment of potential Māori co-researchers was considered in this study and recruitment paperwork was reviewed with the Māori advisor; however, specific recruitment strategies were not discussed. In New Zealand it is very important to partner with Māori and to seek guidance for effective ways of doing so. Telephone calls and emails were made to an organisation that provides disability information, advice, and support to whānau<sup>6</sup> with disabilities and their communities. It has since been learned that an approach in person may have been more successful (Health Research Council of New Zealand, 2010). To my Pākeha or western way of thinking, I considered that it may not be respectful to arrive in person at an organisation without first having made contact in another way. However, the face-to-face approach may have been seen as being more polite as well as demonstrating an effort to engage and partner with this organisation.

Methods of communication during the study may also be considered a limitation. When the recruitment process was completed, a number of documents were sent out to the co-researchers prior to the first meeting and throughout the search conference process.

Initially a package of information was sent to assist the co-researchers in orientating to this study (Appendix D), as well as practical information including maps for the venue for the first meeting. Co-researchers were not required to have access to email or to the internet to be a part of this study; however, it became apparent as the search conference meetings progressed that the majority of the group continued to communicate online between meetings, sharing their thoughts and reflections. After the fourth meeting it was observed that email communications were frequently used to progress their action plans. While I made every effort to continue to include the two co-researchers that did not have email access by posting documents and the email communications to them and telephoning regularly, it was noted that they were less able to contribute to the discussions that occurred between meetings. The time delay of the postal system was also discussed as a potential barrier to engagement with the project. For example, a summary of the research findings was mailed to the co-researchers in the week before a meeting, but in some cases the co-researchers advised that they had not received it by

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<sup>6</sup> Whānau: extended family, family group, a familiar term of address to a number of people (Māori Dictionary: Te Aka Māori-English English-Māori Dictionary, 2013b).

the meeting; this could have affected their ability to comment on the findings within the meeting.

Another limitation affecting this study was that the universal design assessment to be used and the public building to be assessed by the co-researchers were both chosen prior to the start of the search conference. This meant that the co-researchers were not given the opportunity to explore the universal design assessments that I uncovered and then come to a group consensus as to which tool would be trialled in this study. During discussion in the fifth meeting, I advised the group that I had uncovered very few assessments for universal design in public buildings. I mentioned that the checklist in Universal Design New York 2 (Levine, 2003) was considered for this study and gave the reasons that I chose not to use it. It was apparent that co-researchers were interested in other tools that might be available – “can you cut and paste that [checklist] out and send it to us?” (Donald, meeting 5, p. 22). To have had the selection of the assessment be a group process may have encouraged greater acceptance of the tool that was chosen and may have altered the feedback with respect to the strengths and potential improvements to the assessment.

The co-researchers also did not have the opportunity to choose the public building that was to be assessed. One co-researcher had previous knowledge of the building, which was beneficial to the research group; however, this may have also coloured their assessment of it. Another co-researcher shared previous experiences of libraries as a place where he didn’t belong because of a disability-related issue, although it had been essential to engage with as part of university study. This could have also affected the way that he scored the building. It was noted that there were no volunteers to lead the dissemination of the results of the universal design assessment of the library, though there was widespread agreement that this was an important action of the project. If the building had been chosen by the co-researchers there may have been a volunteer to lead this action plan.

One of the key strengths of this research study was that the research processes overall were participatory. Pragmatic action research demands dialogue, mutual learning, and cogenerative research (Greenwood & Levin, 2007) and the search conference method requires the researcher to act as a facilitator rather than leader of the process (Rehm, et al., 2002). Partnership occurred with the co-researchers of this study in a number of ways, from the initial sharing in a group the barriers and facilitators that the co-researchers had experienced in public buildings to the actions that were chosen and

worked on as a group to promote universal design in New Zealand. These collaborative processes were essential in the co-researchers being involved and committed to the process which lasted a number of months. The level of commitment to the project was also evidenced by the volunteered increase in time spent meeting together, the many ongoing communications by email between meetings, and the fact that action plans and research dissemination continues to date by the co-researchers. This type of partnership and action research is seen as an important emergent area for occupational therapists.

While most occupational therapists work to enable individual change, systemic barriers in the real world outside of the clinical setting will determine what can be accomplished... Occupational therapists can... link [with] established community advocates to break down these systemic barriers. Collaboration and partnership are the way to develop the knowledge base and confidence required for people with special needs to fully participate in society. (Dickinson, 2007, p. 276)

I argue that occupational therapists need to break down systemic environmental barriers not just for those with 'special needs', but for all people, to enable their full and equal participation in their communities and society. Until occupational therapists do their part to help people access public spaces we contribute to occupational injustice and social isolation (Townsend & Whiteford, 2005).

### **Future Research**

There are a number of areas of potential future research stemming from this small-scale action research study. These include quantitative research on the Task Scenarios, universal design assessment of a public building by users early in the design process, research on design professionals' engagement with building users, and a larger search conference on universal design involving a wide range of stakeholders.

As the Task Scenarios are one of the few available assessments for universal design in public buildings, further quantitative research is needed on this assessment. The Task Scenarios have been used by a limited number of assessors, by five design professionals (Afacan & Erbug, 2009), and the modified version by eight building users in this study. To establish whether the Task Scenarios are reliable, potentially with further modifications proposed by the co-researchers of this study, larger-scale quantitative research is needed. To establish power, it is estimated that 10 researchers would need to assess a minimum of 10 buildings each for statistical significance (N. Garrett, personal communication, March 23, 2011).

Secondly, it is acknowledged within the research literature (Ormerod & Newton, 2005), as well as by the co-researchers in this study, that universal design needs to be considered as early in the design process as possible. As such, further research could involve a diverse group of building users assessing a planned building according to universal design from an early design stage. This research could be carried out in a number of ways, such as by using physical 3D models of buildings or newer technology such as 3D-imaging software. Some architecture firms advocate for the use of physical 3D models. They report that particularly with Māori clients, the geographical orientation of buildings and spaces is very evident in this way of working (M. Kelderman, personal communication, November 22, 2011). This is reported to enable clients to effectively visualise where a building sits in relation to other buildings on the site and in relation to significant landmarks, and to be able to physically pick up a building and easily change its position on the model if that is what is desired. With respect to technology such as 3D-imaging software, this has become a common way for architects to demonstrate their initial design concepts (Habitus Living, 2013) and layouts of a building to clients that have commissioned the work. However, research into the use of 3D software with building users as a method of uncovering environmental barriers and facilitators according to universal design does not appear to have been conducted.

How design professionals engage with user groups that set out to influence the universal design of public buildings is another avenue for potential future research. For example, design professionals in partnership with diverse members of the community could put into practice experiential learning as a method for learning about universal design. The mayor of Eidskog, Norway, reported that this type of process was applied when his town was selected as one of the 13 regions where universal design would be initially developed. The town council, in partnership with a range of community groups including those with a specific disability focus, explored their municipality to uncover the barriers and facilitators to universal design within their town. The mayor reported that now, instead of sitting around the table discussing whether something should or should not be done to improve the universal design of a building or space, the conversation is “when and how could this be done”. He reports that this has led to more productive discussions and is leading to better outcomes for participation (K. Woie, personal communication, June 15, 2012).

Finally, as discussed within the limitations of this study, research on a larger-scale search conference involving a diverse range of stakeholders addressing universal design in public buildings would be beneficial. Stakeholders could include architects, designers, policymakers, building owners, and property developers, as well as building users. Similar to this study, co-researchers could be drawn from the community to observe whether learning to use a universal design assessment and working as a group similarly emerges as a useful means of promoting universal design in public buildings and spaces. The power of reflection by the co-researchers also leads to further implications for research with respect to search conferences. As discussed previously, search conferences typically run for two and a half days over a weekend. This may not allow sufficient time for the participants in the conference to reflect, suggesting that to explore the potential for promoting reflection in a standard search conference may be beneficial.

The action of one person can change a lot, but the actions of many,  
coming together as one, can change the world.

(Bono, 2005)

## Conclusion

This study highlights the importance of collaboration and partnership with users of public buildings. The study aimed to be participative, democratic, and inclusive. A diverse group of users have valuable insights as to facilitators and barriers to participation based on the principles of universal design. The process of coming together as a group enables sharing of knowledge, networks, and resources and enables the barriers to participation to be explored in depth and concrete action steps to be developed and actioned. Ongoing commitment and energy to the project was supported by the group process. The study also demonstrates the significance of reflection, not just on my part as the lead researcher, but also by the co-researchers, as they deepened their understanding of universal design and of each other, which facilitated their action plans in promoting universal design. This study provides a framework for working with, rather than working for, users of public buildings.

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## **Appendices**

## **Appendix A – Principles of Inclusive Design**

The principles of inclusive design (Commission for Architecture and the Built Environment, 2006)

1. Inclusive design places people at the heart of the design process.
2. Inclusive design acknowledges diversity and difference.
3. Inclusive design offers choice where a single design solution cannot accommodate all users.
4. Inclusive design provides for flexibility in use.
5. Inclusive design provides buildings and environments that are convenient and enjoyable to use for everyone.

## Appendix B – Glossary of Selected Terms

**Accessibility:** “the extent to which norms and guidelines in legislation and other official documents are met” (Iwarsson & Ståhl, 2003, p. 60) or compliance with official norms and standards (Preiser & Ostroff, 2001).

**Approachability:** Includes provision of an accessible route. This route “shall extend from the street boundary and car parking area to those spaces within the building required to be accessible to enable people with disabilities to carry out normal activities and processes within the building” (Standards New Zealand, 2001, p. 12).

**Barrier-free design:** “a design concept to make the built environment accessible to people with physical disabilities and/or older people by removing the architectural barriers present in existing buildings” (Saito, 2006, p. 463).

**Building:** “a temporary or permanent movable or immovable structure including a structure intended for occupation by people, animals, machinery, or chattels” (Building Act, 2004, s.8).

**Inclusive design:** “a way of designing products and environments so that they are usable and appealing to everyone regardless of age, ability, or circumstance by working with users to remove barriers in the social, technical, political, and economic processes underpinning building and design” (Newton & Ormerod, 2007).

**Public building:** it “must totally or partially open to or intended to be used by members of the public; must be a building; but it does not matter whether the public has to pay to use it or whether the public can be excluded from time to time” (Building Act, 2004, s.362a).

**Universal design:** “a process that enables and empowers a diverse population by improving human performance, health and wellness, and social participation” (Steinfeld & Maisel, 2012, p. 29).

**Universal usability:** “in architectural terms is concerned with making buildings and facilities as universally usable as possible for everyone, rather than for the vast majority of a target population” (Afacan & Erbug, 2009, p. 733).

**Usability:** “how well the design of the environment restricts and supports the satisfaction of goals and desires” (Iwarsson & Ståhl, 2003, p. 60).

**Visibility:** accommodation parameters that are extended to enable public buildings to be visited by all kinds of disabled people (Goldsmith, 2000).

## Appendix C – Characteristics of Included Studies

Author/Year	Aim	Country	Discipline	Type of study	Participants/ Papers	Findings	Strengths/Limitations
Afacan & Erbug, 2009	To examine whether heuristic evaluation could successfully integrate universal usability into building design practice.	Turkey	Architecture	Qualitative - heuristics	5 participants	Sequential heuristic evaluation was an efficient method for evaluating how well the usability of a newly design shopping mall conformed to universal design. There were usability problems that could not have been detected solely on construction drawings. Interdisciplinary design and collaboration methods are needed for universal usability. Interdisciplinary characteristics of the evaluators increased the problem discovery rate. The interior architects found usability problems related to the interior design of the mall, the architects to building elements and the urban planner to the building-site relationship.	Strengths: interdisciplinary participant team, credibility, confirmability. Limitations: transferability, dependability.
Carlsson, Iwarsson & Stahl, 2002	To explore how functional capacity can be operationalised at a group level, and to study its complexity from the ageing perspective.	Sweden	Occupational Therapy, Engineering	Longitudinal prospective cohort	72 participants	It is not valid to operationalise functional capacity based on diagnosis, which is the most common 'unit' or classification used in medical and health care research. Profiles of functional impairments become more complex with age. Impacts on universal design, authors argue that the design of environmental details cannot be completed without valid knowledge on the prevalence of functional limitations in different groups.	Strengths: reliable and valid assessment measure, triangulated with observation and interview. Limitations: self-reports of diagnosis could lead to an under-reporting of diagnosis, significant mortality of cohort at 6 year follow up (32% of study participants), generalisability (based in one locality in Sweden).

Author/Year	Aim	Country	Discipline	Type of study	Participants/ Papers	Findings	Strengths/Limitations
Chard & Couch, 1998	To complete an access audit of university buildings.	England	Occupational Therapy	Cross-sectional on site survey	6 participants	There is public awareness of the needs of mobility impaired people; however, awareness of the needs of people with other impairments is less evident. Accessibility cannot be guaranteed by good design alone, the policies and procedures for managing a building have an impact on its usability. For example, stair lifts and induction loops are ineffective if no one knows how to use them and remote control doors need routine checking. Database was created identifying buildings with good accessibility and those with difficult access that can be considered in long term building refurbishment plans. This can enable prioritisation with respect to need and resources available.	Limitations: while participatory action research methodology recommended it was not followed due to time and funding constraints, inter-rater reliability of the assessment tools not discussed, total number of buildings assessed not provided (approximately 60% of the campus), overall accessibility of the university buildings not provided.
Cooper, Cohen & Hasselkus, 1991	To review the occupational therapy literature on barrier free design.	United States	Occupational Therapy	Literature review	Not stated (Reference list = 24 papers/texts)	Most guidelines have focussed on accessibility for wheelchair users on the assumption that if it is suitable for these users it will be equally suitable for other users. This is not the case, therefore, it is uncertain whose needs take precedence. Consistent reference in the literature to: accessibility, mobility, function and safety. Increased awareness amongst OTs of the ANSI guidelines for accessibility. The Enabler model provided four areas to consider: mental functioning, sensory, internal body regulation and motor impairment. This model could link OT, the multi-disciplinary team and barrier free design.	Strengths: important and relevant literature included - examined and critiqued both qualitative and quantitative research articles and occupational therapy textbooks.
Danford, 2003	To examine the extent to which universal design is realised through a case study building.	United States	Psychology	Case study	32 participants	People with vision and mobility impairments in particular found the case study building, designed according to universal design principles, to be easier to use than other buildings. All participants found the 14 set activities to be easier to complete in the case study building than in other buildings.	Strengths: people with impairments and people without impairment included as participants. Weaknesses: participants and data collection procedures could be more thoroughly described.

Author/Year	Aim	Country	Discipline	Type of study	Participants/ Papers	Findings	Strengths/Limitations
Fange, Iwarsson & Persson, 2002	To investigate perceived problems of accessibility and visiting preferences to public facilities among teenagers with functional limitations.	Sweden	Occupational Therapy	Cross sectional questionnaire	33 participants	Choice of facilities to visit – accessibility solely directed visits for 1/3 of participants. Outdoor accessibility – surface material (i.e. paving stones) biggest barrier as well as high and steep curbs. Building barriers – steps at shop entrances, restricted space, heavy doors, picking items from shelves and paying, reading signs, steep ramps, key to toilet. Facilitators – ramps, automatic doors, large text notifying accessible facilities, bannisters, large spaces inside, auditive information, merchandise catalogues, good personal service, positive attitude from the facility owner.	Strengths: examined facilitators to accessibility as well as barriers. Limitations: significant number of drop outs (20%), rigour of qualitative data not reported, conclusions broad and did not stay focussed on the study's stated aim.
Gossett, Mirza, Barnds & Feidt, 2009	To explore the decision making process during the construction of a new office building housing a disability rights organisation.	United States	Disability Studies, Occupational Therapy, Public Health, Urban Planning	Qualitative - phenomenology	1 building	Creating environments that are universally designed, accessible and sustainable is challenging but possible, careful analysis of competing needs is required. Documented the process to take the philosophy of universal design and translate into pragmatic reality, at times there is no 'one universal design'. Process proposed to be as important as the end product. Encouraged 'grassroots' involvement of stakeholders. Use of systematic data collection tools proposed, though additional tools recommended such as anthropometric tools for user information (i.e. strength, mobility, vision, etc).	Strengths: Credibility: range of participants, variety of methods for data collection, triangulation (sources, methods and researchers). Confirmability: team of researchers and checking with expert colleagues. Limitations: Transferability: case study so less transferrable, Dependability: no audit trail.

Author/Year	Aim	Country	Discipline	Type of study	Participants/ Papers	Findings	Strengths/Limitations
Grabois, Nosek & Rossi, 1999	To determine if primary care physicians are in compliance with ADA and to what extent offices of primary care physicians are usable for persons with disabilities.	United States	Physical Medicine and Rehabilitation	Cross sectional questionnaire	62 participants	7/10 physicians in newly constructed offices (after 1993) consulted with a builder, architect, etc to oversee compliance with ADA. 24% of physicians reported that they had the continuous path and a wheelchair accessible washroom, telephone and water fountain in the renovated areas. 55% of physicians reported that they had a continuous unobstructed pedestrian path and 1 other 'accessible feature' such as a wheelchair accessible restroom, water fountain or telephone. Authors concluded that 75% of physicians are more than 50% compliant. 18% of physicians could be interpreted as non-compliant with the ADA, primarily due to referring patients with a disability although they generally treat the particular condition.	Limitations: self report - no observation of the physician's office, low response rate - possible sample bias.
Gradziel, 2007	To determine the perceptions of Ontarian occupational therapists who incorporate universal design principles into their clinical reasoning and to describe how these principles are being applied.	United States	Occupational Therapy	Cross sectional email survey	190 participants	96% of Ontarian OTs believe it to be somewhat important, important or highly important to apply universal design principles in residential, commercial, institutional and public environments. Using universal design increases access to the environments that clients use or may choose to use. 65% of Ontarian OTs incorporated universal design into their clinical reasoning. Most common reason stated was to increase accessibility for clients. Another reason was to increase a client's independence, safety or function. Universal design was considered to be client centred.	Limitations: possible sample bias, low return rate, results not reported in terms of statistical significance.
Heckel, 2003	To identify the factors which contribute to the viability of the concept of universal design and its relevance for architects.	United States	Architecture	Literature review	Not stated (Reference list = 139 papers/texts/we bpages)	Designers must carefully define the problems that they are attempting to solve. Architects and designers in universal design realise that everyone experiences functional limitations at one time or another. History of the accessibility movement and review of origin of the concept of universal design. Urban and private settings reviewed and the passage of the ADA 1990. Future of universal design in the field of architecture examined in terms of teaching, attitudinal barriers, evaluation of design, and usability and aesthetics.	Limitations: methodology not stated for inclusion of literature. Rigour assessments of literature not included.

Author/Year	Aim	Country	Discipline	Type of study	Participants/ Papers	Findings	Strengths/Limitations
Heylighen, 2008	To analyse parallels between sustainable and inclusive design and investigate reasons for low uptake in architecture.	Belgium	Architecture	Literature review	Not stated (Reference list = 45 papers/texts/conference proceedings)	Lack of uptake of sustainability and universal design attributed to: the lack of knowledge that has the applicability to architectural practice, lack of infrastructure to make available knowledge more transparent and disseminated more efficiently, and secrecy within the profession that inhibits information sharing between architectural firms.	Limitations: methodology of literature review not discussed. Rigour assessments of articles not reported. "Secrecy" within the profession not supported by the provision of evidence.
Huss Pace, 2006	To explore what universal design features are preferred in an apparel retail store by older women.	United States	Human Ecology	Cross sectional survey	127 participants	Participants selected universal design features majority of the time (74%) and were most concerned with spatial issues – narrow aisles and lack of open spaces. Participants preferred wayfinding cues, such as directions to particular parts of the store, products or sizes. Recommendations for retailers are to use 60 inch wide aisles free of obstructions, open floor spaces (three foot turning circle) and to use informative focal points with strong value contrast (colour contrast and text that is easy to see and understand).	Strengths: extensive literature review. Limitations: women aged 55 and over only.
Imrie & Kumar, 1998	To document the diverse experiences of disabled people with regards to access in the built environment.	England	Geography	Qualitative - phenomenology	30 participants	Problems in built environments restrict independence and negate the concept of equal opportunity. This includes getting from place to place and accessing buildings, as well as occupations such as employment. Attitudes and reactions from others can be as big of a barrier as environmental barriers. Professionals often overlook experiential sources such as disabled people during the design and planning stages. Disabled often viewed as a homogeneous group, and access often weighted towards wheelchair users than other disabilities.	Strengths: large sample size. Limitations: theoretical perspective and methodology not stated, lack of transferability, dependability and confirmability.
Ivanoff, Iwarsson & Sonn, 2006	To examine how assistive technology and physical environmental issues have been studied in occupational therapy literature.	Sweden	Occupational Therapy	Literature review	76 papers	Highlighted a number of research gaps, authors recommended study designs which reflect a societal level in the three PEO components. Prevalence and incidence studies lacking, additional longitudinal studies are recommended. Further conceptual and theoretical development recommended.	Strengths: three independent investigators, clear methodology, broad inclusion criteria. Limitations: lack of concept definitions.

Author/Year	Aim	Country	Discipline	Type of study	Participants/ Papers	Findings	Strengths/Limitations
Iwarsson & Stahl, 2003	To position, define and discuss three concepts: accessibility, usability and universal design for research and practice concerning person-environment relationships.	Sweden	Occupational Therapy, Engineering	Literature review	45 papers	Accessibility: based on norms and official guidelines, therefore, varies internationally and over time. It may represent societal ambitions. Usability: due to the personal component, has substantial variation. Usability changes over time and according to the current state of the user – may be affected by fatigue, mood, or health. Usability considered to be a more positive concept – related to functioning rather than disability. It is a measure of effectiveness, efficiency and satisfaction. Universal design: can be the least stigmatising concept, as it relates to all users; considers that there is only one population, comprised of individuals representing diverse characteristics. The seven principles of universal design are widely acknowledged in the literature. Universal design is a process more than a definite result. It is about changing attitudes throughout society – emphasising democracy, equity and citizenship.	Strengths: extensive literature review of quantitative, qualitative articles, unpublished studies also included.
Iwarsson, Fange, Hovbrandt, Carlsson, Jarbe & Wijk, 2004	To evaluate an OT based intervention aimed at increasing accessibility to public buildings in a Swedish town centre.	Sweden	Occupational Therapy	Before and after (on site observations, follow up interviews)	5 facilities	Results were that the total number of environmental barriers increased slightly post intervention, but that the results were not statistically significant. Three out of five facility owners had used the intervention to some extent. Two owners had previous experience with people with functional limitations and used this for planning for accessibility. The study concluded that the positive effects of interventions suggested by OTs were at best moderate. Identified barriers: attitudinal barriers, lack of financial incentives to invest in accessibility. Facilitators: one facility that employed a disabled worker. When barriers are eliminated ad hoc, they may create additional problems.	Strengths: good inter-rater reliability of the assessment tool. Limitations: detail of the assessment tool may provide 'false' positives (i.e. where no ramp – 1 barrier, however 'bad' ramp may be several barriers), documents provided to the facility owner (intervention) not clear as to the length nor breadth of the information provided.

Author/Year	Aim	Country	Discipline	Type of study	Participants/ Papers	Findings	Strengths/Limitations
Johnson, Clarkson & Huppert, 2010	To review existing capability data sets and to identify challenges in measuring capability informative for work in inclusive design.	England	Engineering, Psychiatry	Literature review	Not stated (Reference list = 62 papers/texts)	Many existing surveys of disability do not reliably provide an indication of capabilities or the range of capabilities is too limited. The largest design relevant capability database excluded data from people living in institutions. Seven further research questions developed around the affects on capability: self-reporting, proxy reporting, performance assessment, interaction with products, environment (controlled or home), activity measures, and psychological resources.	Strengths: extensive literature review. Limitations: methodology of literature review not stated.
Kaufman-Scarborough, 2001	To generate insights into the psychological and interpersonal barriers encountered in retail environments.	United States	Marketing	Qualitative - ethnographic	9 groups	There are logistical barriers, psychological reactions of the disabled consumer and interpersonal barriers that affect disabled person's participation in shopping. Logistical barriers included ramps and narrow aisles, lack of rest areas and frequent problems encountered in change rooms. Psychological reactions included: embarrassment, fear, anger and frustration. Interpersonal barriers included: lack of communication with the disabled shopper and avoidance.	Strengths: Credibility. Limitations: transferability, dependability and confirmability.
Luck, 2003	To observe how user needs are discussed when architects meet with building users.	England	Construction Management	Qualitative - grounded theory	6 participants	Extrapolating individual user preferences to a broader population should be approached cautiously; people with the same disability may share similar experiences when they use buildings or they may not share views on particular issues. Insight into a users' experience of an environment can be revealed through discussion. In some cases, language use was limited (for example in describing aesthetics of a building) and absence of a common vocabulary could potentially limit discussion of a building to basic constructs.	Strengths: Credibility, transferability. Limitations: dependability, confirmability.
Martin, 1987	To assess accessibility of public buildings for wheelchair users in New York.	United States	Occupational Therapy	Cross sectional on site survey	13 facilities	Proposed need to refine regulations, due to difficulties with interpretation. Regulations regarding elevators – many buildings have “complied” by making freight elevators as access for the disabled – this is seen by the author as not convenient nor palatable to the consumer. Trend of improved compliance in newer buildings. Compliance: 1/13 toilet, 2/13 parking, doorways 6/13.	Limitations: sampling method not stated, small geographical area, only one building built after the 1982 guidelines which formed part of the assessment tool.

Author/Year	Aim	Country	Discipline	Type of study	Participants/ Papers	Findings	Strengths/Limitations
McClain, 2000	To evaluate the compliance of a new shopping centre and two older shopping centres that have undergone renovation subsequent to the ADA's enactment.	United States	Occupational Therapy	Cross sectional on site survey	3 facilities	Barriers identified in relation to: parking (compliance 67-95%), ramps (2/3 malls had ramps that were too steep), and restrooms (variety of non-compliance, only 1/16 features compliant in all 3 malls). Telephones were all compliant, knee clearance at all food courts were all not compliant. Aisles were often too narrow, particularly in department stores.	Strengths: reliable and valid assessment measure. Limitations: small sample size in one geographic region, no statistical comparisons provided in relation to the three malls, possible seasonal bias.
McClain & Todd, 1990	To survey 20 grocery and convenience stores regarding their level of accessibility.	United States	Occupational Therapy	Before and after (on site observations, follow up interviews)	20 facilities	Results appear to state that there was no difference between accessibility between urban and rural stores, but that grocery stores were more accessible than convenience stores. Parking seen as lowest area of compliance 70% compliant for grocery stores and 16% compliant for convenience stores. Of the 20 managers that were sent letters, five made improvements to some of the areas addressed as being deficient (primarily in parking).	Limitations: convenience sampling (including 6/13 buildings higher education), small sample size, statistical significance of results was not calculated, survey combined two different guidelines (ANSI 1971 and ATBCB 1982).
McClain, Beringer, Kuhnert, Priest, Wilkes, Wilkinson & Wyrick, 1993	To determine compliance of restaurants with wheelchair accessibility standards United Federal Accessibility Standards (1984).	United States	Occupational Therapy	Cross sectional on site survey	120 facilities	Functional problems related to ADA compliance provide physical barriers affecting the lives of OT clients. Areas of non compliance including parking (53% compliant), restrooms (60% compliant), entrance ramps/lack of ramp (66% compliant), knee clearance of fixed seating (35% compliant).	Strengths: large sample size. Limitations: convenience sampling, speculation on the types of affects of the physical barriers on the lives of the individuals, range of restaurants that were excluded from the study.
McClain, Cram, Wood & Taylor, 1998	To explore the perceptions of three wheelchair users on the impact of ADA on accessibility of public buildings.	United States	Occupational Therapy	Qualitative - phenomenology	3 participants	Some accessibility issues were pervasive across the ages (i.e. problems with parking, restrooms and building entrances). All participants commented about the attitudes, particularly the benefits of acceptance of others. Authors stated that participants were not aware of their civil rights relative to Title III of the ADA.	Strengths: high level of rigour in terms of credibility, dependability and confirmability. Two in depth interviews followed by a member check. Limitations: small sample size, child participant not well described.

Author/Year	Aim	Country	Discipline	Type of study	Participants/ Papers	Findings	Strengths/Limitations
Nelson, Jones & Salkind, 1986	To document the architectural barriers found in privately owned public use facilities and to evaluate efforts to prompt voluntary removal of barriers.	United States	Educational Psychology	Randomized control trial	359 facilities	Survey concluded that 90% of nearly 2000 facilities presented substantial barriers to accessibility and that 55% were totally inaccessible. Barriers included: parking (23% compliant), lack of ramps (67% compliant), bathroom access (68% compliance), bathroom features (31-55% compliant), telephones (10% compliant), elevator (20-60% compliant). Telephone or in person contacts considered to be the most effective and cost-effective strategy for promoting accessibility. Strong financial incentives may encourage voluntary removal of architectural barriers.	Strengths: large sample size, control group. Limitations: comparisons not completed between types of facilities, sample bias.
Ormerod & Newton, 2005	To assess the nature and extent to which accessible environments for new public buildings are considered at the briefing stage of the design process.	United Kingdom	Architecture	Cross sectional questionnaire and case studies	961 participants	Personal experience of disability influences consideration of accessible features. Access issues should be part of the briefing process. Minimum standards of Part M are used, guidance and codes of practice less used. Architects have limited understanding of the DDA 1995. Consultation with end users is an important element in briefing, but is less prevalent with disabled end users. Features of a building that support inclusion are more focused towards people with mobility impairments rather than those supporting less obvious impairments such as sight and hearing.	Strengths: large sample size, some open ended questions to learn from the participants and their point of view. Limitations: minimal literature review, possible sampling bias. Analysis methods of case studies not provided.
Prellwitz & Tamm, 2000	To describe how pupils with restricted mobility perceive their school environment with regard to physical-technical and psychosocial-social accessibility.	Sweden	Occupational Therapy	Qualitative - phenomenology	10 participants	Pupils generally found indoor environments accessible, outdoor environments, particularly in winter, less so. Most pupils were excluded from physical education classes. Older students did not like working with an assistant.	Strengths: confirmability - inductive data analysis by two researchers independently, and follow up interviews used for correction/clarification. Limitations: procedural rigour - reliability and validity of assessment tool not discussed. Dependability - no audit trail provided.

Author/Year	Aim	Country	Discipline	Type of study	Participants/ Papers	Findings	Strengths/Limitations
Rattray, 2007	To investigate perceptions of accessibility on a university campus.	United States	Anthropology	Qualitative - participatory	30 interviews	What is universal design is dependent on the user. Attitude is an important aspect of accessibility. Campus users have adaptive strategies to enable use of the buildings. Participatory research appears to be beneficial for researching universal design.	Strengths: participatory research design. Weaknesses: participants and study design could have been further described.
Rivano-Fischer, 2004	To assess the accessibility to public buildings for wheelchair users in Al Ain, UAE.	United Arab Emirates	Physiotherapy	Cross sectional on site survey	17 buildings	Highest compliance: university building, shopping mall and administration building (73%) compliant. Lowest compliance bank (13%). Highest compliance: accessible route (76%) lowest parking (19%). 3/17 buildings had designated accessible toilets. Trend of newer buildings being more accessible.	Strengths - appears to be a valid measure, based on ADAAG. Limitations - small sample size. Possible measurement bias.
Rose, 1999	To determine the level of compliance with ADA for chiropractic clinics.	United States	Chiropractic	Cross sectional survey	101 participants	Entrances and parking reported to be most compliant (92% and 83% respectively). 58% had an elevating table, 12% had Braille signage and 2% had TDD.	Limitations - self report, clinics were not observed. Self generated survey, no reliability or validity data. Possible sampling bias.
Saito, 2006	To understand how facility managers practice universal design and to identify factors that facilitate or obstruct their practice.	Japan, United States	Urban planning	Comparative cross sectional surveys	62 participants Japan, 128 participants United States	Many facility managers in both countries recognised the advantage of applying universal design in their workplaces and practice it currently at different levels. Most workplaces currently provided accessibility only within the scope of legal requirements. Most facility managers perceived cost as the biggest barrier to implementation of universal design. Understanding and commitment of top management considered to be a key to driving universal design.	Strengths: extensive literature review, definitions of barrier free, accessible and universal design provided to the participants. Limitations: very low response rate to survey, possible sampling bias.

Author/Year	Aim	Country	Discipline	Type of study	Participants/ Papers	Findings	Strengths/Limitations
Schranner, de Jonge, Layton, Bringolf & Molenda, 2008	To identify key methodological issues for economic analyses of costs and effectiveness of assistive technology and universal design based on the International Classification of Functioning, Disability and Health.	Australia	Economics and Finance, Occupational Therapy	Economic analysis	3 case studies	Universal design is considered to be a cost effective option in contrast to providing individuals with more expensive assistive technology to enable participation. The ICF is utilised as a biopsychosocial framework to explore environmental facilitators, environmental barriers and participation.	Strengths - generalisability. Weaknesses - case studies hypothetical.
Stark, Hollingsworth, Morgan, Chang & Gray, 2008	To examine the inter-rater reliability of the Community Health Environment Checklist.	United States	Occupational Therapy	Cross sectional on site survey	30 buildings	High inter-rater reliability of an assessment to measure the physical environment. Strongest agreement with restrooms (.99), least with amenities (.76).	Strengths - training of raters described. Limitations - minimal description of buildings assessed.
Thapar, Warner, Drainoni, Williams, Ditchfield, Wierbicky & Nesathurai, 2004	To compare functional access to public buildings and facilities for persons with and without impairments.	United States	Occupational Therapy	Cross sectional on site pilot study	30 buildings, 4 participants	All participants had high task performance. Structural barriers highest for the wheelchair user (WC) and mobility impaired (MI) participant, (building entrances and restrooms). All participants had wayfinding difficulties. Facilitators were structural for WC and MI. Wayfinding facilitators reported by visually impaired participant.	Strengths - extensive literature review. Use of participant without an impairment. Limitations - person without impairment changed throughout the study. Small sample size.

Author/Year	Aim	Country	Discipline	Type of study	Participants/ Papers	Findings	Strengths/Limitations
Tokar, 2004	To examine the current level of institutional commitment to creating exhibits that are universally designed and accessible for visitors with disabilities.	Canada, United States	Liberal Arts	Cross sectional survey	153 participants	Mobility impaired participants had the highest accessibility with vision impaired participants the lowest (73% of institutions reported that half or fewer of exhibits were accessible to those that are visually impaired). Smaller museums were far less likely to consult advisors with disabilities. Most institutions are using formative evaluation of exhibits and most are assessing access as part of the evaluation. Awareness of universal design higher in large museums than small. Challenges to universal design were cost and space, followed by the idea that some exhibits could not be designed to be accessible to all users.	Limitations - self report, museums were not observed to assess for accessibility/universal design features. Access not defined for the survey respondents therefore open to interpretation, though universal design was. Rigour of qualitative component of the questionnaire not provided.
Useh, Moyo & Munyonga, 2001	To evaluate accessibility of wheelchairs into public buildings and to identify architectural barriers faced in Harare, Zimbabwe.	Zimbabwe	Occupational Therapy	Cross sectional on site survey	20 buildings	Parking and ramps least compliant (18% and 38% mean compliance respectively). Elevators highest compliance (83% mean compliance). Trend of overall increase in compliance in newer buildings.	Strengths - good assessment reliability and validity and pilot study completed. Limitations - no evidence provided to support reasons for low compliance.

## **Appendix D – Participant Information Pack**

Email sent and mailed to the participants:

Hello,

Here is some additional information prior to our first meeting on Wednesday, 1st Feb. 10:30am-2:30pm (AD113).

The following documents are attached:

- Meeting dates and times with an overview of the search conference process
- Overview of the first meeting
- AUT North Shore campus map - Room is AD113, Main Entry, Carpark 4A
- The Principles of Universal Design - pdf document - includes pictures
- The Principles of Universal Design - word document - text only (same text as on the pdf with a bit of additional background information)

I will be providing lunch for the first two meetings, please advise me ASAP (if you haven't already), if you have any allergies/food preferences.

We have a really amazing group of people for this project, and I am really looking forward to meeting you all again soon. Any questions or concerns, please call me on 921 9999 ext 7122 or mobile 027XXXXXX.

Cheers,

Elise

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<http://www.aut.ac.nz/profiles/elise-copeland>

## **Meeting dates and times**

Meetings will take place for four consecutive Wednesdays in February 2011:

**Meeting #1:** Feb. 1st 10:30am-2:30pm (lunch will be provided)

**Meeting #2:** Feb. 8th 10:30am-2:30pm (lunch will be provided)

**Meeting #3:** Feb. 15th 10:30am-12:00pm (coffee/tea will be provided)

**Meeting #4:** Feb. 22nd 10:30-12:00pm (coffee/tea will be provided)

**Meeting #5:** will be scheduled for the end of May.

## **Search conference process**

As a group we will be proceeding through a six stage process to come up with actions as part of this action research. It is very much a 'learning by doing' model of working, with pair and group activities on each day that we meet. The only experience that you need is what you already have gained through your experiences in public buildings.

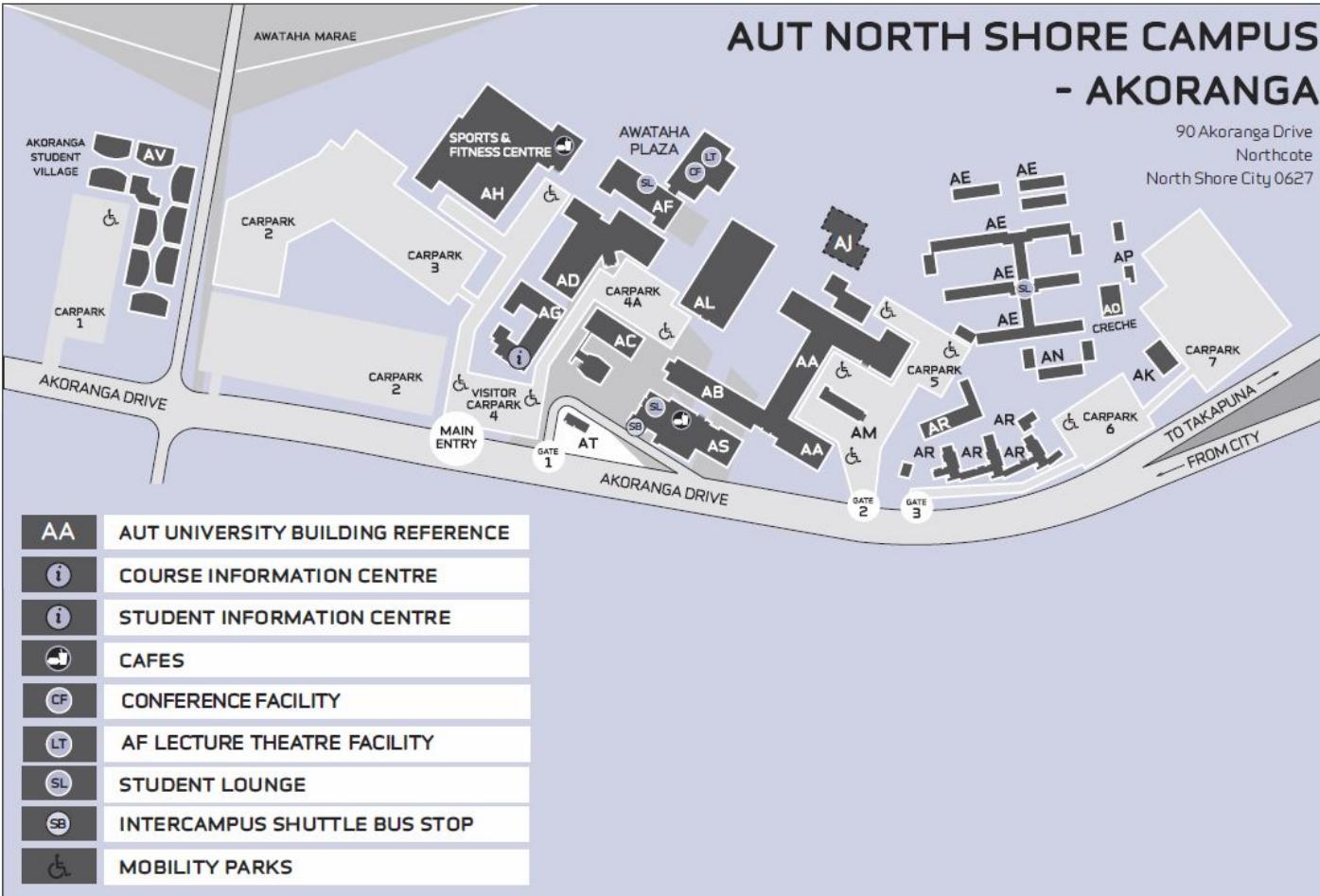
The six steps that we will be working through are as follows:

1. Creating a shared history
  - Sharing examples of barriers and facilitators that you have encountered in public buildings
2. Assessing a public building
  - After exploring the universal design principles and an assessment tool, you will go out to assess a public building according to the universal design principles
3. Sharing a vision of a desirable future
  - What could the future look like in 10 years if the concept of universal design was widely accepted?
4. Identifying action plans
  - Coming up with as many ideas as possible to promote the concept of universal design in public buildings
5. Choosing among plans
  - Collectively prioritising and choosing among the plans that have been considered
6. Initiate change (end of February – end of May)
  - In pairs or small groups, working on specific action plans that you have chosen

At the follow up meeting in May we will get together to share and celebrate achievements and learning that has taken place.

## **Overview of the first meeting, 1<sup>st</sup> February, 2011 (10:30am-2:30pm)**

1. **Welcome** and review of the search conference process
2. **Introductions** to each other and sharing of expectations and hopes for this project
3. Collectively we will establish some **group ground rules**
4. **Global context** – as a group we will try to answer the question: What has been happening in the world in the last 5-7 years and what is important to consider as we plan for the future?
5. **Shared history** – sharing of examples of barriers and facilitators that we have experienced in public buildings
6. **Universal design** – we will begin to explore the concept of universal design and the universal design principles and what they mean in the design of public buildings



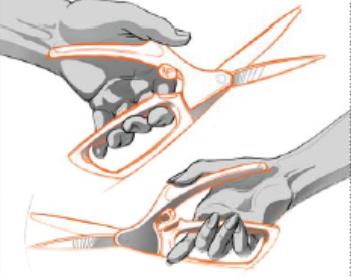
Please enter at the '**Main Entry**' – turn right into carpark 4 then proceed to **carpark 4A** for drop off.

The building is AD – room number **AD113**.

My mobile number is: **027XXXXXXX** please call if you have any difficulties. Elise

# The Principles of Universal Design



 <p><b>Equitable Use</b> The design is useful and marketable to people with diverse abilities.</p> <p>1a. Provide the same means of use for all users: identical whenever possible; equivalent when not. 1b. Avoid segregating or stigmatizing any users. 1c. Provisions for privacy, security, and safety should be equally available to all users. 1d. Make the design appealing to all users.</p>	 <p><b>Flexibility in Use</b> The design accommodates a wide range of individual preferences and abilities.</p> <p>2a. Provide choice in methods of use. 2b. Accommodate right- or left-handed access and use. 2c. Facilitate the user's accuracy and precision. 2d. Provide adaptability to the user's pace.</p>	 <p><b>Simple and Intuitive Use</b> Use of the design is easy to understand, regardless of the user's experience, knowledge, language skills, or education level.</p> <p>3a. Eliminate unnecessary complexity. 3b. Be consistent with user expectations and intuition. 3c. Accommodate a wide range of literacy and language skills. 3d. Arrange information consistent with its importance. 3e. Provide effective prompting and feedback during and after task completion.</p>	
 <p><b>Perceivable Information</b> The design communicates necessary information effectively to the user, regardless of ambient conditions or the user's sensory abilities.</p> <p>4a. Use different modes (pictorial, verbal, tactile) for redundant presentation of essential information. 4b. Provide adequate contrast between essential information and its surroundings. 4c. Maximize "legibility" of essential information. 4d. Differentiate elements in ways that can be described (i.e., make it easy to give instructions or directions). 4e. Provide compatibility with a variety of techniques or devices used by people with sensory limitations.</p>	 <p><b>Tolerance for Error</b> The design minimizes hazards and the adverse consequences of accidental or unintended actions.</p> <p>5a. Arrange elements to minimize hazards and errors: most used elements, most accessible; hazardous elements eliminated, isolated, or shielded. 5b. Provide warnings of hazards and errors. 5c. Provide fail safe features. 5d. Discourage unconscious action in tasks that require vigilance.</p>	 <p><b>Low Physical Effort</b> The design can be used efficiently and comfortably and with a minimum of fatigue.</p> <p>6a. Allow user to maintain a neutral body position. 6b. Use reasonable operating forces. 6c. Minimize repetitive actions. 6d. Minimize sustained physical effort.</p>	 <p><b>Size and Space for Approach and Use</b> Appropriate size and space is provided for approach, reach, manipulation, and use regardless of user's body size, posture, or mobility.</p> <p>7a. Provide a clear line of sight to important elements for any seated or standing user. 7b. Make reach to all components comfortable for any seated or standing user. 7c. Accommodate variations in hand and grip size. 7d. Provide adequate space for the use of assistive devices or personal assistance.</p>

## **UNIVERSAL DESIGN:**

**The design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design.**

The authors, a working group of architects, product designers, engineers and environmental design researchers, collaborated to establish the following Principles of Universal Design to guide a wide range of design disciplines including environments, products, and communications. These seven principles may be applied to evaluate existing designs, guide the design process and educate both designers and consumers about the characteristics of more usable products and environments.

The Principles of Universal Design are presented here, in the following format: name of the principle, intended to be a concise and easily remembered statement of the key concept embodied in the principle; definition of the principle, a brief description of the principle's primary directive for design; and guidelines, a list of the key elements that should be present in a design which adheres to the principle. (Note: all guidelines may not be relevant to all designs.)

### **PRINCIPLE ONE: Equitable Use**

The design is useful and marketable to people with diverse abilities.

#### **Guidelines:**

- 1a.** Provide the same means of use for all users: identical whenever possible; equivalent when not.
- 1b.** Avoid segregating or stigmatizing any users.
- 1c.** Provisions for privacy, security, and safety should be equally available to all users.
- 1d.** Make the design appealing to all users.

### **PRINCIPLE TWO: Flexibility in Use**

The design accommodates a wide range of individual preferences and abilities.

#### **Guidelines:**

- 2a.** Provide choice in methods of use.
- 2b.** Accommodate right- or left-handed access and use.
- 2c.** Facilitate the user's accuracy and precision.
- 2d.** Provide adaptability to the user's pace.

### **PRINCIPLE THREE: Simple and Intuitive Use**

Use of the design is easy to understand, regardless of the user's experience, knowledge, language skills, or current concentration level.

#### **Guidelines:**

- 3a.** Eliminate unnecessary complexity.
- 3b.** Be consistent with user expectations and intuition.
- 3c.** Accommodate a wide range of literacy and language skills.
- 3d.** Arrange information consistent with its importance.
- 3e.** Provide effective prompting and feedback during and after task completion.

### **PRINCIPLE FOUR: Perceptible Information**

The design communicates necessary information effectively to the user, regardless of ambient conditions or the user's sensory abilities.

#### **Guidelines:**

- 4a.** Use different modes (pictorial, verbal, tactile) for redundant presentation of essential information.
- 4b.** Provide adequate contrast between essential information and its surroundings.
- 4c.** Maximize "legibility" of essential information.
- 4d.** Differentiate elements in ways that can be described (i.e., make it easy to give instructions or directions).
- 4e.** Provide compatibility with a variety of techniques or devices used by people with sensory limitations.

### **PRINCIPLE FIVE: Tolerance for Error**

The design minimizes hazards and the adverse consequences of accidental or unintended actions.

#### **Guidelines:**

- 5a.** Arrange elements to minimize hazards and errors: most used elements, most accessible; hazardous elements eliminated, isolated, or shielded.
- 5b.** Provide warnings of hazards and errors.
- 5c.** Provide fail safe features.
- 5d.** Discourage unconscious action in tasks that require vigilance.

## **PRINCIPLE SIX: Low Physical Effort**

The design can be used efficiently and comfortably and with a minimum of fatigue.

### **Guidelines:**

- 6a.** Allow user to maintain a neutral body position.
- 6b.** Use reasonable operating forces.
- 6c.** Minimize repetitive actions.
- 6d.** Minimize sustained physical effort.

## **PRINCIPLE SEVEN: Size and Space for Approach and Use**

Appropriate size and space is provided for approach, reach, manipulation, and use regardless of user's body size, posture, or mobility.

### **Guidelines:**

- 7a.** Provide a clear line of sight to important elements for any seated or standing user.
- 7b.** Make reach to all components comfortable for any seated or standing user.
- 7c.** Accommodate variations in hand and grip size.
- 7d.** Provide adequate space for the use of assistive devices or personal assistance.

Please note that the Principles of Universal Design address only universally usable design, while the practice of design involves more than consideration for usability. Designers must also incorporate other considerations such as economic, engineering, cultural, gender, and environmental concerns in their design processes. These Principles offer designers guidance to better integrate features that meet the needs of as many users as possible.

### **Background**

Version 2.0 – 4/1/97

Compiled by advocates of universal design, listed in alphabetical order:  
Bettye Rose Connell, Mike Jones, Ron Mace, Jim Mueller, Abir Mullick, Elaine Ostroff, Jon Sanford, Ed Steinfeld, Molly Story, and Gregg Vanderheiden

Major funding provided by: The National Institute on Disability and Rehabilitation Research, U.S. Department of Education

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## Appendix E – Task Scenarios

*Y. Afacan, C. Erbug / Applied Ergonomics 40 (2009) 731–744*

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### **Appendix A. Five task scenarios including their seven sub-task descriptions**

Task Scenarios	Task descriptions
Task Scenario1 (T1)	<p>Would you please inspect the use of the circulation systems of the mall by:</p> <p>Sub-task 1</p> <ul style="list-style-type: none"> <li>- Using all the stairs/elevators and escalators in each floor regarding their equitable use, i.e.</li> <li>- Do they provide same means of use for all users?</li> <li>- Do they provide privacy, security and safety that are equally available to all users?</li> <li>- Do they make the design appealing to all users?</li> </ul> <p>Sub-task 2</p> <ul style="list-style-type: none"> <li>Using all the stairs/elevators and escalators in each floor regarding their flexibility in use, i.e.</li> <li>- Do they provide choice in methods of use?</li> <li>- Do they accommodate right- or left-handed access and use?</li> <li>- Do they provide adaptability to user's pace?</li> </ul> <p>Sub-task 3</p> <ul style="list-style-type: none"> <li>Using all the stairs/elevators and escalators in each floor regarding their simple and intuitive use, i.e.</li> <li>- Do they eliminate unnecessary complexity?</li> <li>- Are they consistent with user expectations and intuition regardless experience, knowledge or language skills?</li> <li>- Do they arrange information consistent with its importance?</li> <li>- Do they provide effective prompting and feedback during and after task completion?</li> </ul> <p>Sub-task 4</p> <ul style="list-style-type: none"> <li>Analyzing the appropriate use of the tactile, aural, visual design features, such as materials, lighting and furniture within the stairs/elevators and escalators regarding their perceptible information, i.e.</li> <li>- Do they communicate necessary information effectively?</li> <li>- Do they maximize legibility of essential information?</li> <li>- Do they provide compatibility with a variety of techniques and devices used by people with sensory limitations?</li> </ul> <p>Sub-task 5</p> <ul style="list-style-type: none"> <li>Using all the stairs/elevators and escalators in each floor regarding their tolerance for error, i.e.</li> <li>- Do they minimize hazards and adverse consequences of accidental and unintended actions?</li> <li>- Provide fail safe features?</li> <li>- Provide warnings of hazards and errors?</li> </ul> <p>Sub-task 6</p> <ul style="list-style-type: none"> <li>Approaching all the stairs/elevators and escalators from the shopping corridors regarding their low physical effort, i.e.</li> <li>- Do they allow maintaining a neutral body position?</li> <li>- Are they used with reasonable operating forces?</li> <li>- Do they minimize sustained physical effort?</li> </ul> <p>Sub-task 7</p> <ul style="list-style-type: none"> <li>Using all the stairs/elevators and escalators in each floor regarding their size and space for approach and use, i.e.</li> <li>- Do they provide a clear line of sight to important elements for any seated or standing user?</li> <li>- Are all components comfortable to reach?</li> <li>- Do they provide adequate space for use assistive devices or personal assistance?</li> </ul>
Task Scenario2 (T2)	<p>Would you please inspect the use of entrances/exits of the mall by:</p> <p>Sub-task 1</p> <ul style="list-style-type: none"> <li>Using all the entrances/exits in each floor regarding their equitable use, i.e.</li> <li>- Do they provide same means of use for all users?</li> <li>- Do they provide privacy, security and safety that are equally available to all users?</li> <li>- Do they make the design appealing to all users?</li> </ul> <p>Sub-task 2</p> <ul style="list-style-type: none"> <li>Using all the entrances/exits in each floor regarding their flexibility in use, i.e.</li> <li>- Do they provide choice in methods of use?</li> <li>- Do they accommodate right- or left-handed access and use?</li> <li>- Do they provide adaptability to user's pace?</li> </ul> <p>Sub-task 3</p> <ul style="list-style-type: none"> <li>Using all the entrances/exits in each floor regarding their simple and intuitive use, i.e.</li> <li>- Do they eliminate unnecessary complexity?</li> <li>- Are they consistent with user expectations and intuition regardless experience, knowledge or language skills?</li> <li>- Do they arrange information consistent with its importance?</li> </ul> <p>Sub-task 4</p> <ul style="list-style-type: none"> <li>Analyzing the appropriate use of the tactile, aural, visual design features, such as materials, lighting and furniture, within all the entrances/exits in each floor regarding their perceptible information, i.e.</li> <li>- Do they communicate necessary information effectively?</li> <li>- Do they maximize legibility of essential information?</li> <li>- Do they provide compatibility with a variety of techniques and devices used by people with sensory limitations?</li> </ul> <p>Sub-task 5</p> <ul style="list-style-type: none"> <li>Using all the entrances/exits in each floor regarding their tolerance for error, i.e.</li> <li>- Do they minimize hazards and adverse consequences of accidental and unintended actions?</li> <li>- Provide fail safe features?</li> <li>- Provide warnings of hazards and errors?</li> </ul> <p>Sub-task 6</p> <ul style="list-style-type: none"> <li>Approaching all the entrances/exits in each floor from both inside and outside regarding their low physical effort, i.e.</li> <li>- Do they allow maintaining a neutral body position?</li> <li>- Are they used with reasonable operating forces?</li> <li>- Do they minimize sustained physical effort?</li> </ul> <p>Sub-task 7</p> <ul style="list-style-type: none"> <li>Using all the entrances/exits in each floor regarding their size and space for approach and use, i.e.</li> <li>- Do they provide a clear line of sight to important elements for any seated or standing user?</li> <li>- Are all components comfortable to reach?</li> <li>- Do they provide adequate space for use assistive devices or personal assistance?</li> </ul>
Task Scenario3 (T3)	<p>Would you please inspect the use of wayfinding systems of the mall by:</p> <p>Sub-task 1</p> <ul style="list-style-type: none"> <li>Finding your destination through using all pictorial, verbal and tactile wayfinding elements, signage systems, maps, graphic information and marking systems in each floor regarding their equitable use, i.e.</li> <li>- Do they provide same means of use for all users?</li> <li>- Do they provide privacy, security and safety that are equally available to all users?</li> <li>- Do they make the design appealing to all users?</li> </ul> <p>Sub-task 2</p> <ul style="list-style-type: none"> <li>Finding your destination through using all pictorial, verbal and tactile wayfinding elements, signage systems, maps, graphic information and marking systems in each floor regarding their flexibility in use, i.e.</li> <li>- Do they provide choice in methods of use?</li> <li>- Do they facilitate user's accuracy and precision?</li> <li>- Do they provide adaptability to user's pace?</li> </ul>

*(continued on next page)*

**Appendix A (continued)**

Task Scenarios	Task descriptions
	<p>Sub-task 3      Finding your destination through using all pictorial, verbal and tactile wayfinding elements, signage systems, maps, graphic information and marking systems in each floor regarding their simple and intuitive use, i.e.</p> <ul style="list-style-type: none"> <li>- Do they eliminate unnecessary complexity?</li> <li>- Are they consistent with user expectations and intuition regardless experience, knowledge or language skills?</li> <li>- Do they arrange information consistent with its importance?</li> </ul> <p>Sub-task 4      Analyzing the appropriate use of the tactile, aural, visual design features, such as materials, lighting and furniture, within all wayfinding elements, signage systems, maps, graphic information and marking systems in each floor regarding their perceptible information, i.e.</p> <ul style="list-style-type: none"> <li>- Do they communicate necessary information effectively?</li> <li>- Do they maximize legibility of essential information?</li> <li>- Do they provide compatibility with a variety of techniques and devices used by people with sensory limitations?</li> </ul> <p>Sub-task 5      Analyzing the appropriate use of the tactile, aural, visual design features, such as materials, lighting and furniture, within all wayfinding elements, signage systems, maps, graphic information and marking systems regarding their tolerance for error, i.e.</p> <ul style="list-style-type: none"> <li>- Do they minimize hazards and adverse consequences of accidental and unintended actions?</li> <li>- Provide fail safe features?</li> <li>- Provide warnings of hazards and errors?</li> </ul> <p>Sub-task 6      Using all wayfinding elements, signage systems, maps, graphic information and marking systems regarding their low physical effort, i.e.</p> <ul style="list-style-type: none"> <li>- Do they minimize repetitive actions?</li> <li>- Do they minimize sustained physical effort?</li> </ul> <p>Sub-task 7      Using all wayfinding elements, signage systems, maps, graphic information and marking systems regarding their size and space for approach and use, i.e.</p> <ul style="list-style-type: none"> <li>- Do they provide a clear line of sight to important elements for any seated or standing user?</li> <li>- Are all components comfortable to reach?</li> <li>- Do they provide adequate space for use assistive devices or personal assistance?</li> </ul>
Task Scenario4 (T4)	<p>Would you please inspect the use of obtaining product/services of the mall by:</p> <p>Sub-task 1      Passing in and around all the shops in each floor and food court regarding their equitable use, i.e.</p> <ul style="list-style-type: none"> <li>- Do they provide same means of use for all users?</li> <li>- Do they provide privacy, security and safety that are equally available to all users?</li> <li>- Do they make the design appealing to all users?</li> </ul> <p>Sub-task 2      Passing in and around all the shops in each floor and food court regarding their flexibility in use, i.e.</p> <ul style="list-style-type: none"> <li>- Do they provide choice in methods of use?</li> <li>- Do they facilitate user's accuracy and precision?</li> <li>- Do they provide adaptability to user's pace?</li> </ul> <p>Sub-task 3      Passing in and around all the shops in each floor and food court regarding their simple and intuitive use, i.e.</p> <ul style="list-style-type: none"> <li>- Do they eliminate unnecessary complexity?</li> <li>- Are they consistent with user expectations and intuition regardless experience, knowledge or language skills?</li> <li>- Do they arrange information consistent with its importance?</li> </ul> <p>Sub-task 4      Analyzing the appropriate use of the tactile, aural, visual design features, such as materials, lighting and furniture, within all shops in each floor and food court regarding their perceptible information, i.e.</p> <ul style="list-style-type: none"> <li>- Do they communicate necessary information effectively?</li> <li>- Do they maximize legibility of essential information?</li> <li>- Do they provide compatibility with a variety of techniques and devices used by people with sensory limitations?</li> </ul> <p>Sub-task 5      Analyzing the appropriate use of the tactile, aural, visual design features, such as materials, lighting and furniture, within all shops in each floor and food court regarding their tolerance for error, i.e.</p> <ul style="list-style-type: none"> <li>- Do they minimize hazards and adverse consequences of accidental and unintended actions?</li> <li>- Provide fail safe features?</li> <li>- Provide warnings of hazards and errors?</li> </ul> <p>Sub-task 6      Passing in and around all the shops in each floor and food court regarding their low physical effort, i.e.</p> <ul style="list-style-type: none"> <li>- Do they allow maintaining a neutral body position?</li> <li>- Do they minimize repetitive actions?</li> <li>- Do they minimize sustained physical effort?</li> </ul> <p>Sub-task 7      Passing in and around all the shops in each floor and food court regarding their size and space for approach and use, i.e.</p> <ul style="list-style-type: none"> <li>- Do they provide a clear line of sight to important elements for any seated or standing user?</li> <li>- Are all components comfortable to reach?</li> <li>- Do they provide adequate space for use assistive devices or personal assistance?</li> </ul>
Task Scenario5 (T5)	<p>Would you please inspect the use of public amenities – restrooms, information displays, public telephones and seating units of the mall by:</p> <p>Sub-task 1      Using all the restrooms, information displays, public telephones and seating units in each floor regarding their equitable use, i.e.</p> <ul style="list-style-type: none"> <li>- Do they provide same means of use for all users?</li> <li>- Do they provide privacy, security and safety that are equally available to all users?</li> <li>- Do they make the design appealing to all users?</li> </ul> <p>Sub-task 2      Using all the restrooms, information displays, public telephones and seating units in each floor regarding their flexibility in use, i.e.</p> <ul style="list-style-type: none"> <li>- Do they provide choice in methods of use?</li> <li>- Do they facilitate user's accuracy and precision?</li> <li>- Do they provide adaptability to user's pace?</li> </ul> <p>Sub-task 3      Using all the restrooms, information displays, public telephones and seating units in each floor regarding their simple and intuitive use, i.e.</p> <ul style="list-style-type: none"> <li>- Do they eliminate unnecessary complexity?</li> <li>- Are they consistent with user expectations and intuition regardless experience, knowledge or language skills?</li> <li>- Do they arrange information consistent with its importance?</li> </ul>

**Appendix A (continued)**

Task Scenarios	Task descriptions
Sub-task 4	Analyzing the appropriate use of the tactile, aural, visual design features, such as materials, lighting and furniture, within all the restrooms, information displays, public telephones and seating units in each floor regarding their perceptible information, i.e. - Do they communicate necessary information effectively? - Do they maximize legibility of essential information? - Do they provide compatibility with a variety of techniques and devices used by people with sensory limitations?
Sub-task 5	Analyzing the appropriate use of the tactile, aural, visual design features, such as materials, lighting and furniture, within all the restrooms, information displays, public telephones and seating units in each floor regarding their tolerance for error, i.e. - Do they minimize hazards and adverse consequences of accidental and unintended actions? - Provide fail safe features? - Provide warnings of hazards and errors?
Sub-task 6	Using all the restrooms, information displays, public telephones and seating units in each floor regarding their low physical effort, i.e. - Do they allow maintaining a neutral body position? - Do they minimize repetitive actions? - Do they minimize sustained physical effort?
Sub-task 7	Using all the restrooms, information displays, public telephones and seating units in each floor their size and space for approach and use, i.e. - Do they provide a clear line of sight to important elements for any seated or standing user? - Are all components comfortable to reach? - Do they provide adequate space for use assistive devices or personal assistance?

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## Appendix F – Universal Design Assessment/Modified Task Scenarios

Date: \_\_\_\_\_

Time to complete: \_\_\_\_\_

### 1. Entrances/exits

Would you please inspect the use of entrances/exits of the building by: (Please circle yes or no)

1. Using all the entrances/exits in each floor regarding their <b>equitable use</b> , e.g.	
Do they provide same means of use for all users?	Yes No Comments:
Do they provide privacy, security and safety that are equally available to all users?	
Do they make the design appealing to all users?	
2. Using all the entrances/exits in each floor regarding their <b>flexibility in use</b> , e.g.	
Do they provide choice in methods of use?	Yes No Comments:
Do they accommodate right- or left-handed access and use?	
Do they provide adaptability to the user's pace?	
3. Using all the entrances/exits in each floor regarding their <b>simple and intuitive use</b> , e.g.	
Do they eliminate unnecessary complexity?	Yes No Comments:
Are they consistent with user expectations and intuition regardless of experience, knowledge or language skills?	
Do they arrange information consistent with its importance?	
4. Analyzing the appropriate use of the tactile, aural, visual design features, such as materials, lighting and furniture within all the entrances/exits in each floor regarding their <b>perceptible information</b> , e.g.	
Do they communicate the necessary information effectively?	Yes No Comments:
Do they maximize legibility of essential information?	
Do they provide compatibility with a variety of techniques and devices used by people with sensory limitations?	
5. Using all the entrances/exits in each floor regarding their <b>tolerance for error</b> , e.g.	
Do they minimise hazards and adverse consequences of accidental and unintended actions?	Yes No Comments:
Provide fail safe features?	
Provide warnings of hazards and errors?	
6. Approaching all the entrances/exits in each floor from both inside and outside regarding their <b>low physical effort</b> , e.g.	
Do they allow maintaining a neutral body position?	Yes No Comments:
Are they used with reasonable operating forces?	
Do they minimize sustained physical effort?	
7. Using all the entrances/exits in each floor regarding their <b>size and space for approach and use</b> , e.g.	
Do they provide a clear line of sight to important elements for any seated or standing user?	Yes No Comments:
Are all components comfortable to reach?	
Do they provide adequate space for use of assistive devices or personal assistance?	

Adapted from Afacan & Erbug, 2009

## 2. Public amenities

Would you please inspect the use of public amenities – restrooms, information displays, public telephones and seating units of the building by: (Please circle yes or no)

1. Using all the restrooms, information displays, public telephones and seating units in each floor regarding their <b>equitable use</b> , e.g.		
Do they provide same means of use for all users?		Yes No Comments:
Do they provide privacy, security and safety that are equally available to all users?		
Do they make the design appealing to all users?		
2. Using all the restrooms, information displays, public telephones and seating units in each floor regarding their <b>flexibility in use</b> , e.g.		
Do they provide choice in methods of use?		Yes No Comments:
Do they facilitate user's accuracy and precision?		
Do they provide adaptability to the user's pace?		
3. Using all the restrooms, information displays, public telephones and seating units in each floor regarding their <b>simple and intuitive use</b> , e.g.		
Do they eliminate unnecessary complexity?		Yes No Comments:
Are they consistent with user expectations and intuition regardless of experience, knowledge or language skills?		
Do they arrange information consistent with its importance?		
4. Analyzing the appropriate use of the tactile, aural, visual design features, such as materials, lighting and furniture within all restrooms, information displays, public telephones and seating units in each floor regarding their <b>perceptible information</b> , e.g.		
Do they communicate the necessary information effectively?		Yes No Comments:
Do they maximize legibility of essential information?		
Do they provide compatibility with a variety of techniques and devices used by people with sensory limitations?		
5. Using all the restrooms, information displays, public telephones and seating units in each floor regarding their <b>tolerance for error</b> , e.g.		
Do they minimise hazards and adverse consequences of accidental and unintended actions?		Yes No Comments:
Provide fail safe features?		
Provide warnings of hazards and errors?		
6. Using all the restrooms, information displays, public telephones and seating units in each floor regarding their <b>low physical effort</b> , e.g.		
Do they allow maintaining a neutral body position?		Yes No Comments:
Do they minimize repetitive actions?		
Do they minimize sustained physical effort?		
7. Using all the restrooms, information displays, public telephones and seating units in each floor regarding their <b>size and space for approach and use</b> , e.g.		
Do they provide a clear line of sight to important elements for any seated or standing user?		Yes No Comments:
Are all components comfortable to reach?		
Do they provide adequate space for use of assistive devices or personal assistance?		

Adapted from Afacan & Erbug, 2009

### 3. Circulation systems

Would you please inspect the circulation systems of the building by: (Please circle yes or no)

1. Using all the stairs/lifts and escalators in each floor regarding their <b>equitable use</b> , e.g.		
Do they provide same means of use for all users?	Yes	No
Do they provide privacy, security and safety that are equally available to all users?		Comments:
Do they make the design appealing to all users?		
2. Using all the stairs/lifts and escalators in each floor regarding their <b>flexibility in use</b> , e.g.		
Do they provide choice in methods of use?	Yes	No
Do they accommodate right- or left-handed access and use?		Comments:
Do they provide adaptability to the user's pace?		
3. Using all the stairs/lifts and escalators in each floor regarding their <b>simple and intuitive use</b> , e.g.		
Do they eliminate unnecessary complexity?	Yes	No
Are they consistent with user expectations and intuition regardless of experience, knowledge or language skills?		Comments:
Do they arrange information consistent with its importance?		
4. Analyzing the appropriate use of the tactile, aural, visual design features, such as materials, lighting and furniture within the stairs/lifts and escalators regarding their <b>perceptible information</b> , e.g.		
Do they communicate the necessary information effectively?	Yes	No
Do they maximize legibility of essential information?		Comments:
Do they provide compatibility with a variety of techniques and devices used by people with sensory limitations?		
5. Using all the stairs/lifts and escalators in each floor regarding their <b>tolerance for error</b> , e.g.		
Do they minimise hazards and adverse consequences of accidental and unintended actions?	Yes	No
Provide fail safe features?		Comments:
Provide warnings of hazards and errors?		
6. Approaching all the stairs/lifts and escalators from the corridors regarding their <b>low physical effort</b> , e.g.		
Do they allow maintaining a neutral body position?	Yes	No
Are they used with reasonable operating forces?		Comments:
Do they minimize sustained physical effort?		
7. Using all the stairs/lifts and escalators in each floor regarding their <b>size and space for approach and use</b> , e.g.		
Do they provide a clear line of sight to important elements for any seated or standing user?	Yes	No
Are all components comfortable to reach?		Comments:
Do they provide adequate space for use of assistive devices or personal assistance?		

Adapted from Afacan & Erbug, 2009

#### 4. Wayfinding

Would you please inspect the use of wayfinding systems of the building by: (Please circle yes or no)

1. Finding your destination through using all pictorial, verbal and tactile wayfinding elements, signage systems, maps, graphic information and marking systems in each floor re: their <b>equitable use</b> , e.g.		
Do they provide same means of use for all users?	Yes	No
Do they provide privacy, security and safety that are equally available to all users?	Comments:	
Do they make the design appealing to all users?		
2. Finding your destination through using all pictorial, verbal and tactile wayfinding elements, signage systems, maps, graphic information and marking systems in each floor regarding their <b>flexibility in use</b> , e.g.		
Do they provide choice in methods of use?	Yes	No
Do they facilitate user's accuracy and precision?	Comments:	
Do they provide adaptability to the user's pace?		
3. Finding your destination through using all pictorial, verbal and tactile wayfinding elements, signage systems, maps, graphic information and marking systems in each floor regarding their <b>simple and intuitive use</b> , e.g.		
Do they eliminate unnecessary complexity?	Yes	No
Are they consistent with user expectations and intuition regardless of experience, knowledge or language skills?	Comments:	
Do they arrange information consistent with its importance?		
4. Analyzing the appropriate use of the tactile, aural, visual design features, such as materials, lighting and furniture within all the entrances/exits in each floor regarding their <b>perceptible information</b> , e.g.		
Do they communicate the necessary information effectively?	Yes	No
Do they maximize legibility of essential information?	Comments:	
Do they provide compatibility with a variety of techniques and devices used by people with sensory limitations?		
5. Analyzing the appropriate use of the tactile, aural, visual design features, such as materials, lighting and furniture within all the entrances/exits in each floor regarding their <b>tolerance for error</b> , e.g.		
Do they minimise hazards and adverse consequences of accidental and unintended actions?	Yes	No
Provide fail safe features?	Comments:	
Provide warnings of hazards and errors?		
6. Using all wayfinding elements, signage systems, maps, graphic information and marking systems regarding their <b>low physical effort</b> , e.g.		
Do they minimize repetitive actions?	Yes	No
Do they minimize sustained physical effort?	Comments:	
7. Using all the wayfinding elements, signage systems, maps, graphic information and marking systems regarding their <b>size and space for approach and use</b> , e.g.		
Do they provide a clear line of sight to important elements for any seated or standing user?	Yes	No
Are all components comfortable to reach?	Comments:	
Do they provide adequate space for use of assistive devices or personal assistance?		

Adapted from Afacan & Erbug, 2009

## 5. Obtaining products/services

Would you please inspect the use of obtaining products/services of the building by: (please circle yes or no)

1. Obtaining a product/service in the building regarding their <b>equitable use</b> , e.g.		
Do they provide same means of use for all users? Do they provide privacy, security and safety that are equally available to all users? Do they make the design appealing to all users?	Yes	No
Comments:		
2. Obtaining a product/service in the building regarding their <b>flexibility in use</b> , e.g.		
Do they provide choice in methods of use? Do they facilitate user's accuracy and precision? Do they provide adaptability to the user's pace?	Yes	No
Comments:		
3. Obtaining a product/service in the building regarding their <b>simple and intuitive use</b> , e.g.		
Do they eliminate unnecessary complexity? Are they consistent with user expectations and intuition regardless of experience, knowledge or language skills? Do they arrange information consistent with its importance?	Yes	No
Comments:		
4. Analyzing the appropriate use of the tactile, aural, visual design features, such as materials, lighting and furniture when obtaining a product/service regarding their <b>perceptible information</b> , e.g.		
Do they communicate the necessary information effectively? Do they maximize legibility of essential information? Do they provide compatibility with a variety of techniques and devices used by people with sensory limitations?	Yes	No
Comments:		
5. Obtaining a product/service in the building regarding their <b>tolerance for error</b> , e.g.		
Do they minimise hazards and adverse consequences of accidental and unintended actions? Provide fail safe features? Provide warnings of hazards and errors?	Yes	No
Comments:		
6. Obtaining a product/service in the building regarding their <b>low physical effort</b> , e.g.		
Do they allow maintaining a neutral body position? Do they minimize repetitive actions? Do they minimize sustained physical effort?	Yes	No
Comments:		
7. Obtaining a product/service in the building regarding their <b>size and space for approach and use</b> , e.g.		
Do they provide a clear line of sight to important elements for any seated or standing user? Are all components comfortable to reach? Do they provide adequate space for use of assistive devices or personal assistance?	Yes	No
Comments:		

Adapted from Afacan & Erbug, 2009

## Appendix G – Pre-screening Questionnaire



**1. Sex:**

- Female
- Male

**2. Age:**

<input type="radio"/> 15-19 Years	<input type="radio"/> 40-44 Years	<input type="radio"/> 65-69 Years
<input type="radio"/> 20-24 Years	<input type="radio"/> 45-49 Years	<input type="radio"/> 70-74 Years
<input type="radio"/> 25-29 Years	<input type="radio"/> 50-54 Years	<input type="radio"/> 75-79 Years
<input type="radio"/> 30-34 Years	<input type="radio"/> 55-59 Years	<input type="radio"/> 80-84 Years
<input type="radio"/> 35-39 Years	<input type="radio"/> 60-64 Years	<input type="radio"/> 85 Years and Over

**3. Ethnicity:**

- New Zealander
- European
- Maori
- Pacific peoples
- Asian
- Middle Eastern/Latin American/African
- Other

**4. Work status**

- Employed Full Time
- Employed Part Time
- Unemployed
- Not in the Labour Force

**5. Household composition**

- One-Family Household (With or Without Other People)
- Two-Family Household (With or Without Other People)
- Three- or More Family Household (With or Without Other People)
- Other Multiperson Household
- One –Person Household

**6. Type of disability**

- Physical
- Sensory
- Psychiatric/psychological
- Intellectual
- Other
- Not applicable

**7. Why might you be interested in participating in this study?**

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## **Appendix H – Flyer Advertising the Study**



What do I do if I have concerns about this research?

Any concerns regarding the nature of this project should be notified in the first instance to the Project Supervisor, Dr Clare Hocking, [clare.hocking@aut.ac.nz](mailto:clare.hocking@aut.ac.nz), (09) 921 9162.

Concerns regarding the conduct of the research should be notified to the Executive Secretary, AUTEC, Dr. Rosemary Godbold, [rosemary.godbould@aut.ac.nz](mailto:rosemary.godbould@aut.ac.nz), 921 9999 ext. 7122.

Approved by the Auckland University of Technology Ethics Committee on 15<sup>th</sup> November, 2011, AUTEC Reference number 11/294

## Information about the Researcher

Elise Copeland is an occupational therapist who has experience working with a variety of people to promote independence and participation over the last 10 years. She attended the Barrier Free NZ Trust training in 2005.



Elise can be contacted by  
email: [elise.copeland@aut.ac.nz](mailto:elise.copeland@aut.ac.nz)  
phone: 921 9999 ext 7122  
mail: AUT, Private Bag 92006

## Promoting universal design in public buildings: An action research study of community participation



## Information for people participating in a research project with Elise Copeland

**What is action research?**

Action research is about enabling people to engage and participate in decision making about community issues.

**What will be involved in this research?**

You will be invited to a series of meetings to explore the design of public buildings and how the design affects people's ability to participate in their community. You will be asked to visit a public building to look at its features in relation to the idea of universal design "the design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialised design" (Mace, 1985). As a group we will then decide on 'actions' that we may take to promote better access and participation in public buildings.

**When will this happen?**

Meetings will take place on a day and time of the week that is convenient for the group of people who will participate. Four to six meetings will take place between January and May 2012.

**Where will this happen?**

Meetings will take place at the Auckland University of Technology, North Shore campus. Meetings will be audio recorded and transcribed.

**Can I change my mind?**

Yes. At anytime you can decide you don't want to be in the study until the end of the series of meetings.

**What do I do to be part of the study?**

You can call, text or email Elise on:

Phone: 921 9999 ext. 7122

Mobile: 0275702531

Email: [elise.copeland@aut.ac.nz](mailto:elise.copeland@aut.ac.nz).

Elise will then call you to discuss your potential participation in the study and ask a few questions. Elise can visit you at a place of your convenience to discuss the research further with you and to sign a consent form if you are interested in participation

# **Participant Information Sheet**



**Date Information Sheet Produced:**

18<sup>th</sup> October 2011

**Project Title**

Promoting universal design in public buildings: An action research study of community participation

**An Invitation**

My name is Elise Copeland and I am an occupational therapist with 10 years experience promoting independence and participation for individuals. I would like to invite you to consider participating in my research study. This research will contribute to my Masters of Health Science qualification. Your participation in the research study is voluntary and you may withdraw at any time prior to the completion of data collection.

**What is the purpose of this research?**

The aim of this study is to look at public buildings through the lens of universal design - "the design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialised design" (Mace, 1985). We will be looking at environmental barriers in public buildings, and ways that universal design may be promoted to improve community participation.

**How was I identified and why am I being invited to participate in this research?**

As you have contact with or are part of an advocacy service, or have a personal interest in access in public buildings; you may have experience in promoting ideas for social change. You may also have previous research experience, however, this is not a requirement for participating in this research project.

**What will happen in this research?**

If you decide to participate in this research, there will be a series of four to six meetings to participate in. It is anticipated that the first two meetings will be four hours in duration (including a one hour catered lunch break), with the other meetings lasting 90 minutes. Meeting dates and times (between January and May 2012) will be set at a time that is most convenient for all of the six-eight participants, and most likely take place on AUT's north shore campus.

As part of this research, I will be asking you to visit a public building in the community to assess environmental barriers using a tool based on the universal design principles. The data will be analysed and the research group (the researcher and all of the participants) will then decide how the information will be distributed.

**What are the discomforts and risks?**

Every effort will be made to ensure that you are comfortable throughout the research and are not exposed to discomfort or risk. Discomforts that may be faced include not being able to access part of a public building, recollecting previous experiences of

discrimination, or conflict during the group meetings. You are entitled to three free counselling sessions with AUT Health, Well-being and Counselling, should any discomfort arise during the course of this research.

**How will any discomforts and risks be alleviated?**

To minimise any potential for discomfort during the meetings, we will aim to create a positive environment where all participants feel safe and secure. You are welcome to bring a support person with you to all meetings. Group introductions and group ground rules will be negotiated during the first meeting. I will also be carefully considering how the research study can be made accessible, relevant and meaningful for everyone involved.

**What are the benefits?**

This study aims for participants to gain knowledge of universal design principles and to inform action leading to positive social change. By promoting the concept of universal design, it is hoped that public buildings will enable greater participation by all members of society. You may also have the possibility of participating in reporting the findings of the research.

**What compensation is available for injury or negligence?**

In the unlikely event of a physical injury as a result of your participation in this study, rehabilitation and compensation for injury by accident may be available from the Accident Compensation Corporation, providing the incident details satisfy the requirements of the law and the Corporation's regulations.

**How will my privacy be protected?**

Only myself and my research supervisors will have access to the information that is gathered during the course of the study. When referring to you in reports of the findings a pseudonym (false name) or initials can be used and any identifiable material withheld. All of the research data will be kept in securely locked facilities.

**What are the costs of participating?**

The costs to you are in terms of your time to participate. It is estimated that there will be four to six meetings with a total anticipated time of 12 hours. Lunch will be provided for the first two meetings. In addition, you are requested to visit a public building in the community to complete an assessment, taking approximately 1-2 hours. Meetings will be held at the north shore campus of AUT. Travel costs up to \$50 in total will be reimbursed.

**What opportunity do I have to consider this invitation?**

From the time that you have received this information sheet, you will have a minimum of one week to consider your participation in this project. Participation in this project is voluntary and you may withdraw from the project at any time prior to the completion of data collection. If you decide that you no longer want to be a part of the project, you can let me know in person, by email or alternatively you can contact my research supervisors Clare Hocking or Jenni Mace, all details are listed at the bottom of this page.

**How do I agree to participate in this research?**

If you agree to participate in the research, I will meet with you at a venue of your choosing to review the information about the project and to sign a consent form.

**What do I do if I have concerns about this research?**

Any concerns regarding the nature of this project should be notified in the first instance to the Project Supervisor, Dr Clare Hocking, [clare.hocking@aut.ac.nz](mailto:clare.hocking@aut.ac.nz), (09) 921 9162.

Concerns regarding the conduct of the research should be notified to the Executive Secretary, AUTEC, Dr. Rosemary Godbold, [rosemary.godbould@aut.ac.nz](mailto:rosemary.godbould@aut.ac.nz), 921 9999 ext 6902.

**Whom do I contact for further information about this research?**  
Elise Copeland: phone: 921 9999 ext. 7122, [elise.copeland@aut.ac.nz](mailto:elise.copeland@aut.ac.nz)

***Approved by the Auckland University of Technology Ethics Committee on 15<sup>th</sup> November 2011 AUTEC Reference number 11/294***

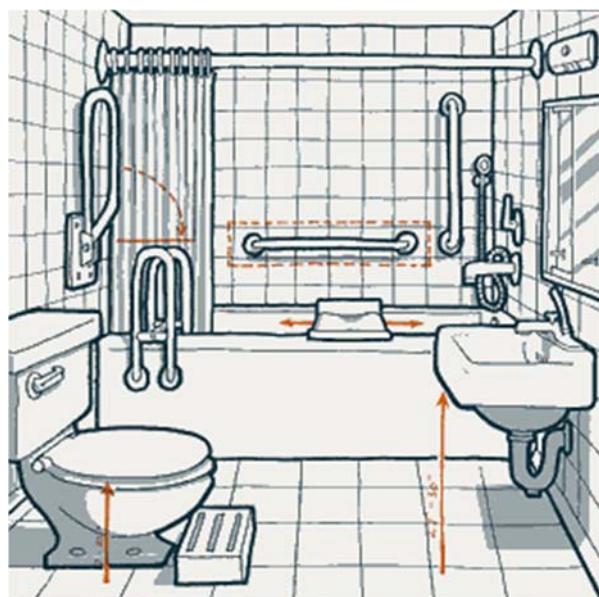
## Appendix J – Participant Information Sheet Companion Document

### Participant Information Sheet Companion (Easyread)

Research study: Promoting universal design in public buildings: An action research study of community participation



My name is Elise and I am an occupational therapist.



I have helped to make people's houses easier to get around.



I would like to see public buildings, like shopping malls and movie theatres easy to get around as well.

What is action research?



Action research is about people coming together to come up with ideas and make plans.

What happens?



You will be invited to 4 to 6 meetings to talk about public buildings and how they are built.



Meetings will be at AUT on the North Shore.

They will happen between January and May 2012.



You will be asked to visit a building and look at how well you can use it.



In the meetings we will talk about universal design – whether the building meets the needs of everyone that use it.



We will decide as a group what we can do to help make buildings easier to use for everyone.

## Appendix K – Ethical Approval



### MEMORANDUM

#### Auckland University of Technology Ethics Committee (AUTEC)

To: Clare Hocking  
From: Dr Rosemary Godbold Executive Secretary, AUTEC  
Date: 15 November 2011  
Subject: Ethics Application Number 11/294 Promoting universal design in public buildings: An action research study of community participation.

Dear Clare

Thank you for providing written evidence as requested. I am pleased to advise that it satisfies the points raised by the Auckland University of Technology Ethics Committee (AUTEC) at their meeting on 31 October 2011 and I have approved your ethics application. This delegated approval is made in accordance with section 5.3.2.3 of AUTEC's *Applying for Ethics Approval: Guidelines and Procedures* and is subject to endorsement at AUTEC's meeting on 28 November 2011.

Your ethics application is approved for a period of three years until 15 November 2014.

I advise that as part of the ethics approval process, you are required to submit the following to AUTEC:

- A brief annual progress report using form EA2, which is available online through <http://www.aut.ac.nz/research/research-ethics/ethics>. When necessary this form may also be used to request an extension of the approval at least one month prior to its expiry on 15 November 2014;
- A brief report on the status of the project using form EA3, which is available online through <http://www.aut.ac.nz/research/research-ethics/ethics>. This report is to be submitted either when the approval expires on 15 November 2014 or on completion of the project, whichever comes sooner;

It is a condition of approval that AUTEC is notified of any adverse events or if the research does not commence. AUTEC approval needs to be sought for any alteration to the research, including any alteration of or addition to any documents that are provided to participants. You are reminded that, as applicant, you are responsible for ensuring that research undertaken under this approval occurs within the parameters outlined in the approved application.

Please note that AUTEC grants ethical approval only. If you require management approval from an institution or organisation for your research, then you will need to make the arrangements necessary to obtain this.

When communicating with us about this application, we ask that you use the application number and study title to enable us to provide you with prompt service. Should you have any further enquiries regarding this matter, you are welcome to contact me by email at [ethics@aut.ac.nz](mailto:ethics@aut.ac.nz) or by telephone on 921 9999 at extension 6902.

On behalf of AUTEC and myself, I wish you success with your research and look forward to reading about it in your reports.

Yours sincerely

Dr Rosemary Godbold  
**Executive Secretary**  
**Auckland University of Technology Ethics Committee**

Cc: Elise Jasmine Nicole Copeland [elise.copeland@aut.ac.nz](mailto:elise.copeland@aut.ac.nz)

From the desk of ...  
Dr Rosemary Godbold  
Executive Secretary  
AUTEC

Private Bag 92006, Auckland 1142  
New Zealand  
F-mail: [ethics@aut.ac.nz](mailto:ethics@aut.ac.nz)

Tel: 64 9 921 9999  
ext 8860  
Fax: 64 9 921 9925  
page 1 of 1

## Appendix L – Confidentiality Agreement



# Confidentiality Agreement

*Project title:* Promoting universal design in public buildings:  
An action research study of community participation  
*Project Supervisors:* Clare Hocking and Jenni Mace  
*Researcher:* Elise Copeland

- I understand that all the material I will be asked to transcribe is confidential.
- I understand that the contents of the tapes or recordings can only be discussed with the researchers.
- I will not keep any copies of the transcripts nor allow third parties access to them.

Transcriber's signature:

A handwritten signature in blue ink, appearing to read "Rachel Neighbour".

Transcriber's name: Rachel Neighbour

Transcriber's Contact Details (if appropriate):

c/- ABC Secretarial  
20 Darren Crescent, Half Moon Bay  
Auckland 2012

Date: 10 February 2012

Project Supervisor's Contact Details (if appropriate):

Dr Clare Hocking, Department of Occupational Science & Therapy  
Auckland University of Technology, Private Bag 92006, Auckland 1142  
clare.hocking@aut.ac.nz  
Ph. 09 921 9162 Fax. 09 9219620

**Approved by the Auckland University of Technology Ethics Committee on 15<sup>th</sup>  
November 2011 AUTEC Reference number 11/294**

*Note: The Transcriber should retain a copy of this form.]*

## Appendix M – Consultation Support Letter



17 October 2011

Elise Copeland  
Auckland University of Technology  
[elise.copeland@aut.ac.nz](mailto:elise.copeland@aut.ac.nz)

Tena koe Elise

**Record of Consultation** - Promoting universal design in public buildings: An action research study of community participation

I am pleased to confirm our consultations to date with regard to incorporating kaupapa Maori dimensions into your proposed research.

As the co-chair of Nga Aho – the Society of Maori Design Professionals ([www.ngaaho.maori.nz](http://www.ngaaho.maori.nz)) I look forward to staying in touch with this research with a view to it making a positive contribution to the development of public buildings and spaces which respond to Maori cultural sensitivities and user dynamics.

Heoi ano

Na maua noa

A handwritten signature in black ink, appearing to read 'Rau Hoskins'.

Rau Hoskins  
Nga Aho Co-Chair 2011/12  
[rau@designtribe.co.nz](mailto:rau@designtribe.co.nz)

## Appendix N – Psychological Support Memorandum



# MEMORANDUM

**TO** Elise Copeland

**FROM** Kevin Baker

**SUBJECT** Psychological support for research participants

**DATE** 3 October 2011

Dear Elise

I would like to confirm that Health, Counselling and Wellbeing are able to offer confidential counselling support for the participants in your AUT research project entitled:

'Promoting universal design in public buildings: An action research study of community participation'

The free counselling will be provided by our professional counsellors for a maximum of **three** sessions and must be in relation to issues arising from their participation in your research project.

Please inform your participants:

- They will need to contact our centres at WB219 or AS104 or phone **09 921 9992 City Campus** or **09 921 9998 North Shore campus** to make an appointment
- They will need to let the receptionist know that they are a research participant
- They will need to provide your contact details to confirm this
- They can find out more information about our counsellors and the option of online counselling on our website:  
**[http://www.aut.ac.nz/students/student\\_services/health\\_counselling\\_and\\_wellbeing](http://www.aut.ac.nz/students/student_services/health_counselling_and_wellbeing)**

Yours sincerely

Kevin Baker  
Head of Counselling  
Health, Counselling and Wellbeing

## Appendix O – Meeting Plans

<b>Meeting Plan #1</b>			
<b>Promoting universal design in public buildings: An action research study of community participation</b>	Date:	01/02/11	
<b>Topic:</b> Shared history	Time:	10:30am-2:30pm	
	Room:	AD113	
<b>Learning Outcomes:</b>			
<ul style="list-style-type: none"> <li>• Global context, universal design</li> </ul>			
<b>Room Preparation:</b>			
<p>Ensure there are seven chairs and space for wheelchair and pram</p> <p>Laptop and projector</p> <p>Tea, coffee and water, cups, plates</p> <p>Paper towel, napkins, tissues</p> <p>Large sheets of paper and permanent markers</p> <p>A4 paper and pens</p> <p>Notebook and pen</p> <p>2 x voice recorders</p>			
<b>Content/Purpose:</b>	<b>Activity</b>	<b>Resource</b>	<b>Time</b>
<p>1. <b>Welcome</b> &amp; thank you to the participants.</p> <p><b>Housekeeping</b> – location of toilets &amp; evacuation pt. in case of fire/emergency. Please take care of your needs whenever you need to, there are a few times when it is important to have everyone in the room, I will let you know before we start and how long it will be for, we can take a break beforehand.</p> <p>Advise re: <b>different abilities</b> – please face the person that you are speaking to and say their name as you address them. Also helpful for the transcriptionists.</p> <p>Review of the <b>search conference process</b>. 2 main purposes today – <b>getting to know one another and starting to get a group understanding of UD.</b></p>		Me	5 min

2. <b>Introductions</b> to each other: <b>Name</b> - “The purpose of this project is to promote participation in public places” – <b>How I heard about the project</b> . Favourite/least favourite building.	For the transcriptionists	Recorders x 2	10 min
3. Sharing of <b>hopes and expectations</b> for the project.	Group sharing	Notebook	25 min
4. <b>Group ground rules</b> – Confidentiality (and you only need to share what you are comfortable to share), agreeing to disagree, agreement about contacting each other outside of the meeting times (?access to transcribed data)	Group sharing	Large paper	20 min
Break	-	-	10 min
5. <b>Global context</b> – what has been happening in the world in the last 5-7 years and what is important to consider as we plan for the future. Ground rule: all perceptions of the environment are valid and are recorded.	Group sharing	Large paper	20 min
LUNCH	-	-	60 min
6. <b>Shared history</b> – each member to share examples of barriers and facilitators that they have experienced in public buildings. This may include important milestones, events or turning points. Reminder to start your story stating your name for the transcribers.	Group sharing	Notebook	45 min
Break	-	-	5 min
7. Exploration of universal design principles. <b>In pairs or groups of three – discuss 2 or 3 of the universal design principles</b> . What do they mean to you and what you might find in a public building to demonstrate this principle?	Pairs  Feedback to group	Paper & pens for participants	15 min  15 min

<p>8. Closure and thank you. Advise that a <b>summary document</b> will be circulated prior to the next meeting, as well as an <b>outline of meeting 2 and the assessment tool</b> based on the universal design principles.  <b>Review of hopes and expectations</b> (some may be too ambitious, others too conservative and hopes that meeting a great group of people might be more easily voiced)</p>		Me	10 min
---	--	----	--------

**Readings:**

Centre for Universal Design. (1997). *Principles of Universal Design, Version 2.0.*

Raleigh, NC: North Carolina State University. Retrieved from

[http://www.ncsu.edu/www/ncsu/design/sod5/cud/about\\_ud/udprinciples.htm](http://www.ncsu.edu/www/ncsu/design/sod5/cud/about_ud/udprinciples.htm)

## **Overview of the first meeting, 1<sup>st</sup> February, 2012 (10:30am-2:30pm)**

1. **Welcome** and review of the search conference process
2. **Introductions** to each other and sharing of expectations and hopes for this project
3. Collectively we will establish some **group ground rules**
4. **Global context** – as a group we will try to answer the question: What has been happening in the world in the last 5-7 years and what is important to consider as we plan for the future?
5. **Shared history** – sharing of examples of barriers and facilitators that we have experienced in public buildings
6. **Universal design** – we will begin to explore the concept of universal design and the universal design principles and what they mean in the design of public buildings

Meeting Plan #2					
<b>Promoting universal design in public buildings: An action research study of community participation</b>	Date:	08/02/11			
<b>Topic:</b> Universal design checklist, desired future	Time:	10:30am-2:30pm			
	Room:	AG130			
<b>Learning Outcomes:</b>					
<ul style="list-style-type: none"> <li>Assessing buildings, future visioning</li> </ul>					
<b>Room Preparation:</b>					
<p>Ensure there are seven chairs and space for wheelchair and pram</p> <p>Laptop and projector</p> <p>Tea, coffee and water, cups, plates</p> <p>Paper towel, napkins, tissues</p>					
<p>Universal design checklists (x3) – practice activity</p> <p>3 x clipboards</p> <p>Large sheets of paper and permanent markers</p> <p>A4 paper and pens</p> <p>Notebook and pen</p> <p>3 x voice recorders</p>					
<p>Universal design checklist – assessment activity (5 pages x 7)</p> <p>Introduction letter</p> <p>Map of Birkenhead Library</p>					
<b>Content/Purpose:</b>		<i>Activity</i>	<i>Resources</i>		
1. Welcome back – any questions/concerns that have arisen from the previous week? Housekeeping – location of toilets and evacuation point in case of fire/emergency Review of the outline of today			Me		
Two main purposes – learning about the universal design assessment tool and developing a shared future vision			10 min		

2. Activity - In pairs/group of three, discuss one of the 5 checklists (omit circulation/obtaining a product-service). What might you uncover in a public building that would demonstrate this principle?	Pair share Feedback	Recorders x 2	15 min 25 min
3. Activity - Now in the same pairs/group of three, try out your checklist on the area that it refers to (i.e. entrances, public amenities, wayfinding)	Assessing the building	Checklists Clipboards	30 min
Break			10 min
4. Feedback on the tool. Questions?	Feedback	Notebook	20 min
LUNCH	-	-	60 min
5. Shared future vision – What is our vision of a desirable future in 10 years? Rule – all ideas are valid.	Brainstorming	Large paper	20 min
6. Establishing a shared future statement – try to group ideas. Then in pairs, groups of three highlight the top three main ideas. Back together as large group – share and compose a future vision.	Pairs  Feedback to group	Paper and pens for participants	35 min  5 min (break if needed)
7. Closure and thank you. Provide checklists for the universal design assessment – Birkenhead Library. Provide map for library. Advise that a summary document will be circulated prior to the next meeting.		Me	10 min
<b>Readings:</b>  Centre for Universal Design. (1997). <i>Principles of Universal Design, Version 2.0</i> . Raleigh, NC: North Carolina State University. Retrieved from <a href="http://www.ncsu.edu/www/ncsu/design/sod5/cud/about_ud/udprinciples.htm">http://www.ncsu.edu/www/ncsu/design/sod5/cud/about_ud/udprinciples.htm</a>  Universal design checklist			

## **Overview of the 2<sup>nd</sup> meeting, 8<sup>th</sup> February, 2012 (10:30am-2:30pm)**

1. Welcome back and **reflections** on last week.
2. **Universal design assessment tool** – we will begin to explore the tool – both its layout and language. We will then try out using the tool in small groups.
3. **Shared future vision** – together we will establish a shared future vision of a desirable future in New Zealand in ten years time.
4. **Public building to assess** – we will discuss the proposed public building to assess and clarify the process and timeframe for the assessment.

Meeting Plan #3			
<b>Promoting universal design in public buildings: An action research study of community participation</b>	Date:	15/02/11	
<b>Topic:</b> Future vision and potential actions		Time:	10:30am-12:00pm
		Room:	AD113
<b>Learning Outcomes:</b>			
<ul style="list-style-type: none"> <li>• Future vision and brainstorming ideas for action</li> </ul>			
<b>Room Preparation:</b>			
<p>Ensure there are seven chairs and space for wheelchair and pram        Tea, coffee and water, cups, napkins</p> <p>Large sheets of paper and permanent markers        A4 paper and pens        Notebook and pen        2 x voice recorders</p> <p>Group ground rules        3 x papers on future vision        Ideas from Week 2 on strips</p>			
<b>Content/Purpose:</b>	<b>Activity</b>	<b>Resources</b>	<b>Time</b>
1. Welcome back – any questions/concerns that have arisen from the previous week? Remembering that we are not going to talk about the tool today, as there may be people that still need to go out to do the assessment. Review of the outline of today  Two main purposes – developing a shared vision and brainstorming ideas for promoting UD		Me Recorders x 2	10 min

<p>2. Activity – From the ideas that we shared last week, are there any themes or groupings that you can identify?</p> <p>3. Now that we have some main themes, let's try to write a future vision statement that encompasses these themes.</p>	Group share	Strips of ideas from week 2	20 min 20 min
Break			5 min
<p>4. Provide quote – Never underestimate the power of a small, committed group of citizens to change the world; indeed it is the only thing that ever has" (Margaret Mead)</p> <p>5. Brainstorming as a large group – ideas for how we could promote UD in New Zealand. Rule: all ideas are valid.</p>	Group share	Lined paper	30 min
<p>6. Closure and thank you. Advise that a summary document will be circulated prior to the next meeting.</p>		Me	5 min

**Overview of the 3<sup>rd</sup> meeting, 15<sup>th</sup> February, 2012 (10:30am-12:00pm)**

**Back in Room AD113**

1. Welcome back and **reflections** on last week.
2. **Shared future vision** – looking at the ideas that were presented in week 2, we will aim to identify themes and then create a future vision statement(s).
3. **Action planning** – we will start our brainstorming of actions that we could do to promote the idea of universal design in public buildings.

**Overview of the 4<sup>th</sup> meeting, 22<sup>nd</sup> February, 2012 (10:30am-12:30pm) Room AD113**

1. Welcome back and **reflections** on last week.
2. **Action planning** – finish brainstorming actions that we could do to promote the idea of universal design in public buildings.
3. **Prioritise** – choosing amongst the various action plans that have been suggested
4. **Skills matrix** – listing key skills needed to implement the action plans
5. **Practicalities** – how group members will contact each other, overall work plan
6. **Review of the universal design assessment tool** – what was good about the tool? What could be better? What is a significant barrier that you uncovered? Was there a significant facilitator that you uncovered?

## **Overview of the 5<sup>th</sup> meeting, 16<sup>th</sup> April, 2012 (2:30pm-4:30pm)**

### **Room AG130**

1. Welcome back.
2. **Review of your experience of the library** – what was good about the library? What barriers were uncovered in the library?
3. **Review of the universal design assessment tool** – what was good about the tool? What could be better?
4. **Review of actions** – what have we accomplished so far?
5. **Action planning** – what is there still to do?
6. **Practicalities** – overall work plan, next meeting time and date

**Overview of the 6<sup>th</sup> meeting, 28<sup>th</sup> May, 2012 (10:30am-12:30pm)**  
**Room AD113**

1. **Celebrating** our successes
2. **Reflecting** on the process
3. **Planning** for research dissemination

## Appendix P – Consent Form

# Consent Form



Project title: Promoting universal design in public buildings: An action research study of community participation

Project supervisors: Clare Hocking and Jenni Mace

Researcher: Elise Copeland

- I have read and understood the information provided about this project in the Information Sheet dated 18<sup>th</sup> October 2011.
- I have had an opportunity to ask questions and to have them answered.
- I understand that the identity of my fellow participants and our group discussions are confidential to the group, and I agree to keep this information confidential.
- I understand that I can choose to be named or to use a pseudonym (false name) for the research, particularly the written results.
- I understand that the group discussions will be audio recorded and transcribed.
- I understand that I may withdraw myself or any information that I have provided for this project at any time prior to completion of data collection, without being disadvantaged in any way.
- If I withdraw, I understand that while it may not be possible to destroy all records of the focus group discussions of which I was a part of, the relevant information about myself including the audio recordings and transcripts, or parts thereof, will not be used.
- I agree to take part in this research project and to participate in the meetings.
- I wish to receive a summary of the final report (please tick one):  Yes  No

Participant's signature: -

---

Participant's name:

---

Participant's contact details (if appropriate):

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Date: \_\_\_\_\_

Note: The Participant should retain a copy of this form.

**Approved by the Auckland University of Technology Ethics Committee on 15<sup>th</sup> November 2011 AUTEC Reference number 11/294**

## Appendix Q – Meeting Summaries

### **Summary from the first meeting, 1st February, 2012**

1. **Overview** of the search conference process – and that we would be looking at the first stage – shared history.
2. **Hopes and expectations for the project** – these included:
  - Publication
  - Advocating – for diversity, for legislation and policy change
  - Raising awareness of barriers faced in public buildings
  - Generating ideas that could be taken up by Auckland Council
  - Generating solutions to the barriers
  - Education and learning
  - Raising awareness of needs of particular groups (i.e. people with sensory impairment, people who are physically challenged, people who are ageing and mothers with children)
  - Interest in research
  - Sharing of personal experiences
  - Providing evidence based research in New Zealand
  - Making the research tool available nation wide
3. **Group ground rules** – these included:
  1. Recognition that we are all learning about each other and the challenges that we each face
  2. Disagreement is good, though debate the idea not the person
  3. Confidentiality – what is said in here (the room) stays in here (particularly personal stories and information) – only share what you feel comfortable sharing with the group
  4. For research/publication purposes – all information to be anonymous unless agreed to otherwise by the participant
  5. Speak clearly, face the person that you are speaking to and try not to talk over each other
4. **Global context** – as a group we discussed global changes in the last 5-7 years are important to consider as we plan for the future:
  - Increasing technology/mobile technology (e.g. phones, touch screens, GPS)
  - Increasing population groups including: those with a disability (longer survival), older adults, mothers returning to work with young children (lack of childcare, breastfeeding in public), disaffected youth (unemployment and decreased access to education)
  - Increasing concerns regarding public safety and security (impacts on accessibility)
  - Expectations and disagreement regarding how easy the environment should be
  - Economic recession (equality suffers, used as an excuse for inaction, welfare cuts)
  - Rebuilding and intensification of cities, losing public space and increasing privatisation, natural disasters, Christchurch, lack of affordable housing
  - Design trends/philosophies, including sustainability/green design, changing role of experts/architects, emphasis on aesthetics
  - United Nations Convention of the Rights of Disabled, ratified by NZ 2008 (monitoring)
  - Growth in disabled people's movements

- New Zealand lacks anti-discrimination legislation eg. ADA (apart from Human Rights Act)
  - Multiculturalism, multi-ethnicity, tangata whenua, biculturalism
  - Increasing body diversity (height, weight)
  - Climate, outdoors
  - Mainstreaming education
  - Increased community focus
5. **Shared history** – each person in the group shared examples of barriers faced in the environment, some of these included:
- Turnstiles in supermarkets
  - Widths of doorways and difficulty opening doors
  - Small sizes of toilets/change rooms
  - Lack of sheltered seating
  - Signage not updating (e.g. on a train)
  - Hearing loops not working
  - Difficulty reaching items (e.g. supermarket, kitchen counters)
  - Not being able to usefully use adapted trolleys in supermarket
  - Difficulty assisting others (e.g. carrying items)
  - Differences in culture and expectations in certain environments
  - Lack of feeling of belonging, feelings of intimidation from public buildings
  - Inability to access information (i.e. books in a library)
  - Travelling to familiar locations, but losing independence when previously independent due to environmental change (e.g. silent terminal, pool lanes)
  - Lack of perceptible information (e.g. Braille menu)
  - Emigration to access services
  - Evacuating public buildings and policies regarding evacuation (e.g. staying behind and waiting for a warden)
  - Lack of reception areas
  - Lifts that do not go to all floors
  - Not allowing guide dogs
  - Slippery floors
6. **Universal design** – after exploring the seven universal design principles, some examples in public buildings were proposed:
1. Equitable use: water feature/landmarks/signage to aid directionality
  2. Flexibility in use: stair rails on both sides provide both stability and directionality, lifts providing multiple modes to operate – voice/tactile/visual buttons
  3. Simple and intuitive use: providing directionality and consistency on a numeric keypad e.g. bump on the number 5 at an ATM or layout of security keypads
  4. Perceptible information: providing signage in the correct location (e.g. not above a doorway for Braille) and of different types
  5. Tolerance for error: having an attendant at a carpark who can operate the electronic arm, security systems having options for getting help rather than ‘locking’ the user out
  6. Low physical effort: self opening doors, swing out seats, heights of benches that are easy to reach
  7. Size and space for approach and use: design of theatres e.g. able to sit in a variety of locations, how to leave a building e.g. feelings of claustrophobia

## **Summary of the 2<sup>nd</sup> meeting, 8<sup>th</sup> February, 2012**

### **1. Welcome and reflections** on last week.

Correction provided by a co-researcher to the process (discussed in week 1) if building owners are not compliant: approach can be made to council, a determination can be sought through the Department of Building and Housing, the Ministry of Social Development and the Office for Disability Issues may contract an independent assessor such as Barrier Free Trust, and the building owner may be served with a notice to fix.

Question was asked where this research will be presented:

- Presentation at Universal Design 2012 (June 11-13) – Oslo, Norway – theme of the conference is Public Space: Inspire, Challenge, Empower
- Auckland Council via the Mayor's Disability Strategic Advisory Group has made an invitation to present early findings
- An abstract has been submitted to Maramatanga Hou: Fresh perspectives (Sept 19-21 – Hamilton, which is the New Zealand Association of Occupational Therapists Conference)
- In addition, the Gender and Diversity Research Group at AUT, which has largely funded this study, has made an invitation to present findings

### **2. Universal design assessment tool** – we tried out using the tool in small groups.

Question asked is the Birkenhead library expecting us? Answer – no, as we do not want them to ‘tidy up’ in expectation of us coming. Each co-researcher was provided with a letter that they can show if anyone asks what they are doing. If the co-researcher is asked to discontinue with the universal design assessment, they should do so, and let Elise know.

Recommendation was made by a co-researcher to add date of assessment (as there may be changes made between the first assessor and later assessors) and time to complete the assessment. It was recommended that co-researchers spend no more than 2 hours assessing the building. Comments are not required in each of the boxes.

The Birkenhead public library is the public building for this assessment. It was chosen as it is new (completed at the end of 2009), is largely accessible (therefore we can concentrate on assessing universal design), and was recommended by the Barrier Free Trust as a good building to assess. One co-researcher noted that they have been involved since conception of the new library. It is anticipated that this will add context for the research group, and the co-researcher is happy for this to be the building assessed, aware that as a group we will be critiquing the building.

Clarification was sought regarding what is meant by a public amenity as compared to obtaining a product/service. For the purposes of the assessment of the library we decided:

- Public amenities included: public toilets, public information, computers
- Obtaining a product service included: front desk, computer check outs

- In addition, when looking at “Circulation” we also want to consider doorways, corridors, and hallways

Discussion was held on whether each individual assesses the building based on themselves or based on the population as a whole. With universal design, the aim is to design for the widest range of needs possible, however, we can each only be experts in our own lived experience. Therefore, if something does not meet our needs, we can clearly state – this feature is not universally designed as it does not meet my needs. If however, it does meet my need, but may not meet someone else's – our comment could be: this may not be universally designed as there may be people not able to use this feature.

**3. Shared future vision** – we began to share ideas of a desirable future in New Zealand in ten years time if universal design ideas were taken up now.

- Interesting/example to rest of the world
- Equitable for the population of Aotearoa
- Increasing tourism
- Greater diversity in workplaces
- Break down barriers
- Educate public
- Better health outcomes
- More interaction between disabled and non-disabled
- Healthy city – including increasing outdoor exercise
- Decreasing isolation
- Technology development including economic advantages
- Physically attractive place
- Socialisation and improved movement
- Improved transport
- Breakdown culture/age/gender/race/class barriers
- Less stigmatisation and increased caring
- New Zealand society recognises that there is a range of abilities and that this is normal
- Places that are usable increase social cohesion
- Increase visibility of disabled people
- Liveable city
- Increase choice including for disabled people
- Don't have to think about it – just is
- Less accidents/safer communities
- Architects, builders, policy makers, and government departments have policies, guidelines and legislation regarding universal design
- Living/designing outside the box – creativity spurs universal design
- Increased equity in workplaces and increased opportunities in employment through decreasing barriers in the physical environment
- Increased implementation of the United Nations Convention on the Rights of Persons with Disabilities
- Design graduates – universal design part of job descriptions – key attributes/skills
- Part of curriculum

- Some good buildings designed according to universal design and beyond buildings
- Buildings in public space awards – consider universal design, acknowledgement of good buildings
- Partnership with business
- Opportunity in Christchurch

## **Summary of the 3<sup>rd</sup> meeting, 15<sup>th</sup> February, 2012**

1. **Shared future vision** – after reviewing the ideas that were presented in the second week, we came up with five main themes reflecting our future vision of New Zealand in ten years' time:

- Inclusion and equity
- Awareness and education
- Wellbeing
- Workplace and employment
- Technology and economics

A number of vision statements were proposed with the current one worded as:  
*The population of Aotearoa can go about their daily lives with decreased barriers.*

Now that we've had a chance to reflect on this vision statement, here are a few ideas from a website on how to write a vision statement, does the vision statement:

- Express the purpose of our group in a way that will inspire us and the organisations we take our vision to
- Use proactive verbs to describe what we want to do
- Use jargon free language
- Read so that anyone connected to the vision can repeat it

If you would like to, have a go at re-writing the vision statement:

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2. **Action planning** – we started brainstorming actions that we could do to promote the idea of universal design in public buildings. These included:

- Add a universal design statement in the unitary plan (planning document for Auckland Council)
- Promote the universal design principles in the "Way-Finding" Project and "Baby-friendly environments" with Counties Manukau District Health board
- Provide consultation to the Auckland Transport guidelines
- Publication of universal design in Women's Health and Parenting magazine
- Guest column in the NZ Herald "Time to think about universal design" – Perspective page
- Respond to the Auckland long term plan re: UD
- Run a UD workshop
- Compose a press release, draft a media plan
- Presentation to Auckland Council, at a Council or Forum meeting

- Take it to the Local Government Commission and Department of Building and Housing for formal recording and noting
- Presentation of universal design principles to the Office for Disability Issues
- Provide UD concepts, research outcomes and principles to the Human Rights Commission, for it to be taken up in their formal documentation re: recommendations as they're at present consulting, (until end of Mar), re: UNCRPD implementation
- Provide research and principles re UD to the Health and Disability Commission for their endorsement and for part of their promotion re Health and Disability Rights and service provision
- Find ways to get the published research and UD related principles in to the corporate and business sector of NZ, e.g. run a workshop
- Present UD to entities such as Architects Forums and firms
- Get UD info out to students, studying architecture, urban design, spatial design, engineering.
- Book an appointment for this research and UD related matters to be presented to in person to the Ministerial Committee on Disability
- Submission to the Social Committee Development Forum
- Present at a meeting of the Diversity Practitioners Trust
- Complete a submission on a new building/renovation
- Feedback regarding the Birkenhead library

Please feel free to pass on any more ideas in advance of our next meeting on the 22<sup>nd</sup> February which we can add to this list. You can do so by email: [elise.copeland@aut.ac.nz](mailto:elise.copeland@aut.ac.nz) or by phone 921 9999 ext 7122.

Please also remember to bring your completed universal design assessment of the Birkenhead library on the 22<sup>nd</sup> February.

## **Summary of the 4<sup>th</sup> meeting, 22<sup>nd</sup> February, 2012**

### **1. Reflections** on last week.

A vision statement for the group was collaboratively decided: "To achieve a society where products and environments are designed to enable optimal participation by all people."

### **2. Action planning** – additional ideas were provided and added to the list.

### **3. Prioritising** – it was suggested that rather than start with a few actions to progress, that we review the list, and remove those that we may not be able to progress due to time, skills needed or timing. Below is the final list of action plans and the co-researchers taking the actions forward:

- Add a universal design statement in the unitary plan (planning document for Auckland Council)
  - Alexandra, Donald, Carol, Martine, Lisa
  - Key date: Alexandra meeting with planners 27 Feb
- Promote the universal design principles in the "Way-Finding" Project and "Baby-friendly environments" with Counties Manukau District Health board
  - Isis and Martine
  - Key date: sooner is better
- Submission on the Auckland Long Term Plan (2012-22)
  - Donald, Lisa, Carol
  - Key dates: Open for consultation from 24 Feb to 23 Mar.
  - Website:  
[http://www.aucklandcouncil.govt.nz/en/aboutcouncil/planspoliciespublications/long\\_term\\_plan/Pages/Home.aspx](http://www.aucklandcouncil.govt.nz/en/aboutcouncil/planspoliciespublications/long_term_plan/Pages/Home.aspx)
- Submission on the Land Transport Plan
  - Donald, Lisa, Carol
  - Key dates: Open for consultation from 24 Feb to 23 Mar?
- Publication of universal design in Women's Health and Parenting magazine
  - Isis, support from Elise
  - Key date: as soon as able
- Guest column NZ Herald "Time to think about universal design" – Perspective page
  - Alexandra proposed as a possibility? Support from Elise
  - Key date: as soon as able
- Run a UD workshop
  - Alexandra, Isis, support from Elise
  - Key date: July as a proposed date

- Submission on the Wider Journey Report (Human Rights Commission)
  - Martine and Donald
  - Key date: Responses required by 30 Mar
  - Website: <http://www.hrc.co.nz/disabled-people/the-wider-journey-report>
- Provide UD principles to the Health and Disability Commission Conference
  - Martine, Isis?
  - Key dates: Planning meeting in Apr, Conference in May
- Get UD info out to students, studying architecture, urban design, spatial design, engineering. Curriculum development.
  - Alexandra, support from Elise
  - Key date: Alexandra to advise
- Present at a meeting of the Diversity Practitioners Group
  - Isis, support from Elise
  - Key date: Isis to advise
- Complete a submission on a new building/renovation
  - Carol, Elise
  - Key date: not known
- Feedback regarding the Birkenhead library
  - All co-researchers suggested
  - Key date: May
- Upskill ourselves first so that we can effectively pass on UD knowledge to others
  - All co-researchers suggested
  - Key date: Elise to provide start of reference list/resources 24 Feb

After the research is completed, many of the other presentations (e.g. Department of Building and Housing, Office for Disability Issues, Social and Community Development Forum) are proposed to take place.

#### 4. Skills matrix –

Key skills to implement the above action plans as determined by the group: Preparing submissions, written and oral communication skills. It was determined that the group has the key skills needed to progress the action plans. Networks list to be compiled as additional resources/connections to progress plans.

Noted constraint that Donald, Martine and Alexandra may be unable to speak to presentations on Auckland Council submissions.

5. **Practicalities** – Elise to confirm with each participant their contact details that they wish to share with the group, then send out to all group members. Plan is to hold an additional meeting at the end of April to discuss the universal design assessment tool and the library, Elise to collate results from the co-researchers. Meeting at end of April also to catch up on progress on the action points.

## **Summary of the 5<sup>th</sup> meeting, 16<sup>th</sup> April, 2012 (2:30pm-4:30pm)**

### **1. Review of experiences of the library**

What was good about the library?

- Overall accessible with accessible route
- Different floor surfaces assists with orientation
- Funky building, modern
- Open spaces, light and airy
- Nice atmosphere
- Drive through
- New technology such as sliding doors
- Outdoor area
- Helpful librarian, good management plan

What barriers were uncovered in the library?

- Significant signage issues
- Difficulty with spacing between shelving, top shelving too high
- Confusing dual role of librarians/council officers
- Lift feels scary, narrow lift, lack of signage, unclear signage ("m" for mezzanine), doors closed too quickly, location not intuitive (not in main flow of traffic)
- Safety issue of hitting head on underside of stairs
- Toilets too small, bathroom doors too heavy
- Upstairs area for children – query logic
- Small parents room
- Security gate at top of stairs – good for children, but presents significant barriers for others
- Main entrance doors closed too quickly
- Restrictive and intimidating security gates at main entrance
- Information obstructed by notice boards
- Meeting rooms very small
- Difficulty finding reception desk
- Lowered reception area not useable due to pamphlets
- Difficulty finding main entrance

### **2. Review of the universal design assessment tool**

What was good about the tool?

- Allows change over time, e.g. what is intuitive/ease of use now will change as technology progresses (such as sliding doors)
- Good that it is not number based – e.g. 570mm may be recommended, but 545 or 575mm may be what is useable

What could be better?

- No recommendations for what a builder or architect should do, results could not be easily given to the building manager, what to do now/medium term/long term may be beneficial
- Too much lumped together under “Amenities”
- Tool made the results seem more harsh
- Uncertainty regarding “Tolerance for error”
- Area needed to feedback “You are doing really well here, this is an example of universal design”
- Unclear language in tool, writing set teeth on edge, too much jargon, overwritten
- Not useful to be both quantitative and qualitative

3. **Review of actions** – please refer to updated “Project Groups”
4. **Practicalities** – Next meeting time and date: Elise has sent out invite from Doodle using dates and times suggested in the 5<sup>th</sup> meeting.

## **Summary of the 6<sup>th</sup> meeting, 28<sup>th</sup> May, 2012**

### **1. Celebrating our successes –**

We reflected on the following achievements as a group: written and oral submissions to both the Auckland Long Term Plan and the Auckland Transport Plan, written submission to the Human Rights Commission's Wider Journeys project, and oral presentations to Counties Manukau District Health Board. These are very significant achievements within a short timeframe, and may have lasting effects over a number of years.

### **Ongoing projects –**

We discussed as a group ongoing projects that are continuing: Auckland's Unitary Plan will be out for consultation at the start of 2013, Donald suggested that if research group members are still in contact that we could consider a submission to this.

Martine advised of the opportunity to feedback to the Human Rights Commission on how NZ is doing with respect to implementation of the United Nations Convention on the Rights of People with Disabilities, online survey to be completed by 15<sup>th</sup> June, details emailed to co-researchers.

Alexandra has provided a draft of the article for the New Zealand Herald, please respond with any feedback to Alexandra by 8<sup>th</sup> June.

Elise has provided a draft of the feedback on the Birkenhead library, please respond with any feedback to Elise by 6<sup>th</sup> June.

Donald has suggested that we continue to consider suggestions for modification of the tool used to assess the Birkenhead library. Some recommendations for improvement from the group will be presented at the Universal Design conference in Oslo.

Elise to update the Universal Design resources list and send out to all co-researchers.

### **2. Reflecting on the process –**

We reflected on the process of this research as a group:

The process was considered to enable learning.

The process enabled co-researchers to feel like contributors to the research rather than someone being studied.

With respect to timing that it would have been beneficial to have discussed the feedback on the library at an earlier meeting.

It was discussed that it may have been beneficial to have had a Maori co-researcher to enable that perspective in the group.

### **3. Planning for research dissemination –**

Co-researchers advised that they would like to attend a meeting to be updated from the Universal Design conference in Oslo, Elise will send out dates in early July.

Many co-researchers would like to attend the Urban Design Group forum on 25<sup>th</sup> July, Elise to send out reminder email closer to the date.

## **Appendix R – Letter Co-Researchers Took with Them to the Library**

To whom it may concern:

I am part of a research study titled: **Promoting universal design in public buildings: An action research study of community participation.**

I am currently completing an assessment of the Birkenhead library to uncover how the design of the building adheres to the universal design principles - equity in use, flexibility in use, simple and intuitive use, perceptible information, tolerance for error, low physical effort, and size and space for approach and use (Afacan & Erbug, 2009; Connell, et al., 1997).

I will only be visiting public areas of the library, and notes that are taken are about the design and layout of the building.

### **What do I do if I have concerns about this research?**

Any concerns regarding the nature of this project should be notified in the first instance to the Project Supervisor, Dr Clare Hocking, clare.hocking@aut.ac.nz , (09) 921 9162.

Concerns regarding the conduct of the research should be notified to the Executive Secretary, AUTEC, Dr. Rosemary Godbold, rosemary.godbould@aut.ac.nz, (09) 921 9999 ext. 7772.

**Approved by the Auckland University of Technology Ethics Committee on 15th November, 2011,  
AUTEC Reference number 11/294**

## Appendix S – Sample of One Page of a Completed Assessment

Date: 13 February 2012

Time to complete: 110 minutes

### 1. Entrances/exits

**Would you please inspect the use of entrances/exits of the building by:** (Please circle yes or no)

<b>1. Using all the entrances/exits in each floor regarding their <b>equitable use</b>, e.g.</b>	
Do they provide same means of use for all users?	Yes Comments: Wet area entrance at underground garage parking very attractive if accessible entrance is required, for garage parking moves straight into lift and stairwell; the sound of the self-opening outer door on the ground level, makes its equitable use great for vision impaired and blind persons can hear where it is when they approach it; Exit to upstairs balcony very safe re rails present and flatness;
<b>2. Using all the entrances/exits in each floor regarding their <b>flexibility in use</b>, e.g.</b>	
Do they provide choice in methods of use? Do they accommodate right- or left-handed access and use? Do they provide adaptability to the user's pace?	Yes Comments: absence of revolving electronic doors that force people to walk at a specific pace;
<b>3. Using all the entrances/exits in each floor regarding their <b>simple and intuitive use</b>, e.g.</b>	
Do they eliminate unnecessary complexity? Are they consistent with user expectations and intuition regardless of experience, knowledge or language skills? Do they arrange information consistent with its importance?	Yes Comments: one entrance at the top of the staircase, entering the children's area, has a half sized door which closes automatically behind you which helps re safety and intuitive use;
<b>4. Analyzing the appropriate use of the tactile, aural, visual design features, such as materials, lighting and furniture within all the entrances/exits in each floor regarding their <b>perceptible information</b>, e.g.</b>	
Do they communicate the necessary information effectively? Do they maximize legibility of essential information? Do they provide compatibility with a variety of techniques and devices used by people with sensory limitations?	No Comments: if a blind person, using a guide dog or cane wishes to enter the library via the dry underground/basement area, it won't be possible, for only cars can park there, there is no pedestrian walkway into it; if a taxi drops one off near the front door, it is not possible to do a direct front drop-off; the closest parking is at the accessible carpark nearby, but if the blind person was on their own, someone would either need to direct them verbally how to get to the building or guide them there;

5. Using all the entrances/exits in each floor regarding their <b>tolerance for error</b> , e.g.	
Do they minimise hazards and adverse consequences of accidental and unintended actions?  Provide fail safe features?  Provide warnings of hazards and errors?	No Comments: difficult to judge properly, but I didn't encounter a problem, but then again, I'm blind, so, would be blissfully unaware of hazards or signs of hazards; my guide dog and human with me might have simply guided me around items, without me knowing about it, so, very subjective calling from my side;
6. Approaching all the entrances/exits in each floor from both inside and outside regarding their <b>low physical effort</b> , e.g.	
Do they allow maintaining a neutral body position?  Are they used with reasonable operating forces?  Do they minimize sustained physical effort?	Yes Comments: sliding doors self-opening, so, no additional physical effort required;
7. Using all the entrances/exits in each floor regarding their <b>size and space for approach and use</b> , e.g.	
Do they provide a clear line of sight to important elements for any seated or standing user?  Are all components comfortable to reach?  Do they provide adequate space for use of assistive devices or personal assistance?	No Comments: if a blind person enters the external door via the accessible carpark, there is no verbal voice that informs you to proceed through the second self-opening door and turn right to find the reception desk, so, not very logical, and there is no verbal signs to inform people which lift to take to reach the wet area exit or entrance in the basement for the lifts are not in a straight line from any entrance;

## **Appendix T – Written Submissions by the Co-researchers**

### **Universal Design Research Group submission “the Auckland Long Term Plan (LTP)”**

In 2012, under the guidance of Elise Copeland, an occupational therapist and a Masters in Health Science student at AUT, a co-research group was established to progress action research in the area of Universal Design. This group consists of 7 Auckland based members of the community, with a diverse range in background, knowledge levels about Universal Design, age and ability. One group member identifies as being elderly, five as disabled, one as being a mother, experiencing access and design issues when accompanied by her baby and one other as skilled in research in general.

Of the five disabled people in the group three have sensory impairments and the other two members have a physical impairment. Three of the five disabled co-researchers also work as Disability Advisors at Auckland Council, while the one person who identifies as a mother, experiencing access issues when accompanied by her baby, is affiliated with Women’s Health Action and other women’s related advocacy organisations. Other Co-researchers have links with various community organisations including: Age Concern, CCS Disability Action and Never too old.

This Universal Design Co-research Group is pleased to make a written submission to the LTP and also wishes to make an oral submission. The person to contact regarding an oral submission is:

Elise Copeland, BScOT, PgCert HSc, NZROT  
Lecturer/Year 3 Co-ordinator  
Department of Occupational Science and Therapy  
AUT University  
Private Bag 92006  
Auckland 1142  
T: +9 921 9999 ext. 7122  
F: +9 921 9620

## Introduction to Universal Design

### UNIVERSAL DESIGN:

The design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design (Mace, 1985).

This submission covers issues pertaining to the built environment and access to information and communication as these form vital components of internationally identified universal design principles.

For more information on the principles of Universal Design see Appendix A to this submission.

### Lack of Access to the LTP

The Universal Design Group is dismayed that the LTP was not made available in formats accessible to many disabled people as it was only made available on the Council's website in PDF format. Council has been made fully aware in previous submissions on the Auckland Plan, in advice provided by the Disability Strategic Advisory Group and by its own officers, that Word format is required to ensure that blind people can access written documents of this nature. Furthermore, the lack of any documentation in Easy Read or NZ Sign Language further excludes other Deaf and disabled people from fully accessing the consultation document. Failure to make the Plan available accessibly will mean that disabled people in the region, including members of Council's own Disability Strategic Advisory Group will be unable to have input into this crucial submission process.

### Universal Design Principles in the LTP

Current New Zealand legislation on access to buildings for disabled people is about compliance to minimal standards – 4212 of the Building Code is all about minimal compliance standards for example (Standards New Zealand, 2001). The move to universal design, however, is a significant shift in thinking. Where standards are a major means of barrier-free design and accessibility, universal design is achieved by maximising flexibility and adaptability (Saito, 2006). Universal design as a design philosophy believes that “there is only one population, comprised of individuals representing diverse characteristics and abilities” (Iwarsson & Stahl, 2003, p. 61). It is a move from looking at the abilities of more than one target group, to designing for age, physical size, functional, sensory

and/or cognitive impairment (Heckel, 2003). We believe that Auckland Council, as the largest local authority in Australasian should take a lead in this area and include the universal design principles prominently in the LTP which will assist in achieving the vision of Auckland being the World's most liveable city" (Council, 2011). Universal design also fits well with the strategic directions of "Create a strong, inclusive and equitable society that ensures opportunity for all Aucklanders" and "Create better connections and accessibility within Auckland, across New Zealand and the world" (*ibid*). For examples on ways in which universal design principles could be implemented the following resource is freely available for download: *Universal Design New York 2* (Levine, 2003) from: <http://www.nyc.gov/html/ddc/downloads/pdf/udny/udny2.pdf>.

The Universal Design Research Group recommends that a statement is made in the LTP that Auckland council will adhere to the principles of universal design in all areas of the built environment and landscape and information and communication systems and processes within its control; and that all future planning in these areas will include adherence to the promotion of universal design principles.

## References

- Auckland Council. (2011). *Scorecard shows Auckland liveability improving* Retrieved from  
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- Standards New Zealand. (2001). *NZS: 4121 Design for access and mobility - Building and associated facilities*. Wellington, NZ: Standards New Zealand.

Note: The Universal Design Principles (word document) was attached as an Appendix.

## Universal Design Research Group submission “the Regional Land Transport Programme”

In 2012, under the guidance of Elise Copeland, an occupational therapist and a Masters in Health Science student at AUT, a co-research group was established to progress action research in the area of Universal Design. This group consists of 7 Auckland based members of the community, with a diverse range in background, knowledge levels about Universal Design, age and ability. One group member identifies as being elderly, five as disabled, one as being a mother, experiencing access and design issues when accompanied by her baby and one other as skilled in research in general.

Of the five disabled people in the group three have sensory impairments and the other two members have a physical impairment. Three of the five disabled co-researchers also work as Disability Advisors at Auckland Council, while the one person who identifies as a mother, experiencing access issues when accompanied by her baby, is affiliated with Women’s Health Action and other women’s related advocacy organisations. Other Co-researchers have links with various community organisations including: Age Concern, CCS Disability Action and Never too old.

This Universal Design Co-research Group is pleased to make a written submission to the Regional Land Transport Programme and also wishes to make an oral submission. The person to contact regarding an oral submission is:

Elise Copeland, BScOT, PgCert HSc, NZROT  
Lecturer/Year 3 Co-ordinator  
Department of Occupational Science and Therapy  
AUT University  
Private Bag 92006  
Auckland 1142  
T: +9 921 9999 ext. 7122  
F: +9 921 9620

## Introduction to Universal Design

### UNIVERSAL DESIGN:

The design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design (Mace, 1985).

This submission covers issues pertaining to the built environment, transport and access to information and communication as these form vital components of internationally identified universal design principles. For more information on the principles of Universal Design see Appendix A to this submission. For information on ways that universal design may be addressed in public transport such as: physical exclusion, social exclusion, geographical exclusion, and time based exclusion please refer to:  
Audirac, I. (2008). Accessing transit in universal design. *Journal of Planning Literature*, 23(4), 4-16. doi: 10.1177/0885412208318558

### Lack of Access to the Regional Land Transport Programme

The Universal Design Group is dismayed that the Regional Land Transport Programme was not made available in formats accessible to many disabled people as it was only available on the web in PDF and Ebook formats. Council has been made fully aware in previous submissions on the Auckland Plan, in advice provided by the Disability Strategic Advisory Group and by its own officers, that Word format is required to ensure that blind people can access written documents of this nature. The absence of material in EasyRead and NZ Sign Language exclude other Deaf and disabled people from accessing the consultation documents. Failure to make the Programme available accessibly will mean that disabled people in the region, including members of Council's own Disability Strategic Advisory Group will be unable to have input into this crucial submission process.

### Universal Design Principles in the Regional Land Transport Programme

Current New Zealand legislation on access to transport and buildings for disabled people is about compliance to minimal standards (Standards New Zealand, 2001). The move to universal design, however, is a significant shift in thinking. Where standards are a major means of barrier-free design and accessibility, universal design is achieved by maximising flexibility and adaptability (Saito, 2006). Universal design as a design philosophy believes that "there is only one population, comprised of

individuals representing diverse characteristics and abilities" (Iwarsson & Stahl, 2003, p. 61). It is a move from looking at the abilities of more than one target group, to designing for age, physical size, functional, sensory and/or cognitive impairment (Heckel, 2003). We believe that Auckland Council, as the largest local authority in Australasian should take a lead in this area and include the universal design principles prominently in the LTP which will assist in achieving the vision of Auckland being the World's most liveable city" (Council, 2011). Universal design also fits well with the strategic directions of "Create a strong, inclusive and equitable society that ensures opportunity for all Aucklanders" and "Create better connections and accessibility within Auckland, across New Zealand and the world" (*ibid*). For examples on ways in which universal design principles could be implemented the following resource is freely available for download: *Universal Design New York 2* (Levine, 2003) from: <http://www.nyc.gov/html/ddc/downloads/pdf/udny/udny2.pdf>.

The Universal Design Research Group recommends that a statement is made in the Regional Land Transport Programme that Auckland Transport will adhere to the principles of universal design in all areas of transport vehicles, the built environment and landscape and information and communication systems and processes within its control; and that all future planning in these areas will include adherence to the promotion of universal design principles.

We recommend that Auckland Transport formally adopts the Universal Design Package it has recently shared with the Transport Accessibility Advisory Group.

We further recommend that Auckland Council commission a study such as: Carlsson, G. (2004). Travelling by urban public transport: Exploration of usability problems in a travel chain perspective. *Scandinavian Journal of Occupational Therapy*, 11(2), 78-89. doi:10.1080/11038120410020548 to fully explore usability problems for different groups of people using urban public transport.

## References

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- Standards New Zealand. (2001). *NZS: 4121 Design for access and mobility - Building and associated facilities*. Wellington, NZ: Standards New Zealand.
- Note: The Universal Design Principles (word document) was included as an Appendix.

## Universal Design Research Group submission to “The Wider Journey” Report

In 2012, under guidance of occupational therapist and a Masters in Health Science student, Elise Copeland, a co-research group was established to progress action research in the area of Universal Design. This group’s vision statement is: *To achieve a society where products and environments are designed to enable optimal participation by all people.*

The group consists out of 7 Auckland based members of the community, with a diverse range in background, knowledge levels about Universal Design, age and ability. Five people in the group are disabled: two with visual impairments, one with hearing impairment, two with physical impairment. All participants in the group reported experiencing access issues.

Co-researchers have links with various community organisations including: Age Concern, CCS Disability Action and Never too old.

Three of the group participants also work as Disability Advisors at Auckland Council, while the one person who identifies as a mother, experiencing access issues when accompanied by her baby, is affiliated with Womens Health Action.

This Universal Design Co-research Group wishes to make the following comments in submission form to “The Wider Journey” report, as matters pertaining to the built environment and access to information and communication, form vital components of internationally identified universal design principles.

Note, that the group distinguishes between “access” and “universal design” in that the former mostly implies legislation, standards and compliance, whereas the latter is of an aspirational and best practice nature. Current New Zealand legislation on access to buildings for disabled people is about compliance to minimum standards – NZS: 4121 (Standards New Zealand, 2001).

To us universal design is thus “The design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialised design” (Mace, 1985).

The move to universal design, however, is a significant shift in thinking. Where standards are a major means of barrier-free design and accessibility, universal design is achieved by maximising flexibility and adaptability (Saito, 2006).

A design philosophy believes that “there is only one population, comprised of individuals representing diverse characteristics and abilities” (Iwarsson & Ståhl, 2003, p. 61). It is a move from looking at the abilities of more than one target group, to designing for age, physical size, functional, sensory and/or cognitive impairment (Heckel, 2003).

For examples on ways in which universal design principles could be implemented the following resource is freely available for download: Universal Design New York 2 (Levine, 2003) from:  
<http://www.nyc.gov/html/ddc/downloads/pdf/udny/udny2.pdf>.

**Language/jargon:**

In the report, the term, “disabled toilets” is being used and the recommendation is that this be changed to read “accessible toilets”, as the actual toilets are not disabled/broken in nature, but designed to enhance access and as per universal design principles.

**Referencing to access and disability services providers:**

The Be. Institute’s access related programmes is often referred to in this report and it should be noted that the access reports, contained on Be.’s website, is currently not accessible to many blind and vision impaired persons, with the result that it might be defeating the purpose of promoting wider access, so, we’re recommending that, where there is to be mention of good examples of where access and universal design is being practiced and promoted, examples be listed that are themselves in adherence to those principles.

Examples of companies and agencies that promote access and universal design in an accessible way are the Halberg Trust, in that their “Opening Doors” training to sports and recreational facilities’ staff, as per their “No Exceptions” strategy, encapsulates aspects around the built environment, staff disability awareness and their ways of promotion are accessible as well.

Another example would be Lifetime Design, an agency that promotes accessible housing and complex development, listing design components over and above current legislation and standards.

**Examples of good practice design documentation and voluntary guidelines compliance:**

We’re hoping to recommend that the following items be included in the list already provided in the report, for these are added examples of documentation to capture access and design principles:

Manukau City Council’s BarrierFree Manukau Guide, Manukau City Council received LifeMark accreditation from Lifetime Design in 2010 when designing their latest housing for the elderly stock in Manurewa at Gallagher Court;

**Legislative repercussions:**

The report does not reaffirm what steps people can take, should they believe that a public facility is not compliant, or in other words, that it received resource or building consent in error. Many members of the public are still daunted and unsure of their legislative options or unaware that they’re able to take the matter further with the Department of Building and Housing via a determination request process.

We’re recommending that an example be included in the report of where a determination has been successful with regards to disability access, in order to act as reminder and for education purposes.

<http://www.dbh.govt.nz/userfiles/file/building/determinations/2010/2010-066.pdf>

This has to do with the Whare in the Emelia Maud Dixon's Garden of Memories in Howick, east Auckland, and the determination was processed in 2010.

### **Access to Marae:**

The recommendation is that this report includes initiatives to enhance access to and universal design of Marae. Some of the current accessible Marae project work, is by the Ngati Hine Health Trust, Te Roopu Waiora and Waikato Health Board. On the Waikato Health Board website a developed Marae Accessibility Toolkit can be located.

### **References**

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The rest of our suggestions/recommendations are enclosed as part of the feedback form below.

### **The Wider Journey Feedback Form**

The Wider Journey draft report explores three key issues in the battle to improve accessibility. These are: the built environment, access to information and independent voting. It makes recommendations on how

to improve accessibility for everyone.

## **Access to the built environment**

### **Recommendations:**

1. The reconstruction of Christchurch after the earthquakes is undertaken with the principle of providing a fully accessible city as one of the prime objectives. In particular, the Christchurch City Council and the Canterbury Earthquake Recovery Authority' should, in consultation with disabled people, develop and implement accessibility standards for the rebuild that incorporate international best practice for accessible design.
2. The Ministerial Committee on Disability Issues reviews and updates all design standards that relate to the built environment and where necessary incorporates them into the appropriate legislation. In particular, NZS 4121 Design be reviewed to ensure it continues to meet the needs of all disabled people and aligns with good practice in universal access design.

Do you agree with the recommendations?

Yes

Is there anything you would like to add?

### **Additional recommendations:**

That the mentioned review above include a stocktake of voluntary guidelines such as the Auckland Transport Infrastructure Bus Stop and RTS 14 guidelines with regards to increased pedestrian access, in order to standardise those, to be captured into legislation;

That a national campaign be launched to integrate and enshrine the 7 universal design principles, currently identified as per international best practice, into built environment related policies and strategies at central and local government level, taking into consideration public and private facilities; (Note, that the Universal Design Principles just mentioned are listed in appendix A to this submission).

## **Access to information**

3. Key information from the Canterbury Earthquake Recovery Authority and the Christchurch City Council regarding the Canterbury earthquake recovery and re-build is provided in ways that are accessible to all citizens, including ensuring that all website information conforms

to New Zealand Government Web Standards and all information in an emergency situation is available in accessible formats.

4. The Ministerial Committee on Disability Issues leads the development of a government communications plan for disabled people to ensure they receive all essential government information in an accessible manner. The plan should cover the wider state sector including Crown entities that provide government services. This plan should guide state agencies to:

- a) identify and address appropriate ways to communicate with disabled people to be used for personal correspondence, public information, application forms and requests from individuals for information unique to them;
- b) identify what information will be provided in New Zealand Sign Language;
- c) report against this communications plan each year as part of their accountability under the New Zealand Disability Strategy.

5. All core government departments report annually, as part of their report on compliance with the New Zealand Disability Strategy, on their compliance with the New Zealand Government Web Standards and plans to meet any shortcomings

6. The New Zealand Government Web Standards be made mandatory for all district health boards, territorial local authorities and Crown entities.

Do you agree with the recommendations? Yes  
Is there anything you would like to add?

**Additional recommendation:**

\* That the Government Communications Plan, as per recommendation 4., include territorial authorities, local government agencies and District Health Boards, so that progress can be made for communication of an individual, yet essential nature, such as “electronic Discharge Sheets and Land Rates information”, to be universally designed to enhance accessibility.

**Access to independent voting**

7. Full political participation rights for all New Zealand citizens including those with disabilities are implemented including by:

- a) ensuring Electoral Commission has adequate resources to continue to provide election information in accessible formats and modes;
- b) territorial authorities provide election information and candidate profiles in accessible formats and modes;
- c) political parties and candidates are encouraged to provide campaign information and policies in accessible formats and modes;
- d) public funding of political parties for election campaigning have a proportion of the funding tagged for accessibility provision.

8. The Electoral Commission conducts an off-line trial of technology assisted voting for disabled electors be held as a pilot to being used in the local body and general elections.

9. Electronic voting to be used in the 2013 local body elections and the 2014 general election to allow disabled people access to an independent, secret ballot.

Do you agree with the recommendations? Yes  
Is there anything you would like to add?

**Additional recommendation:**

That telephone voting be included in recommendations 8 and 9, as many disabled and older persons do not have access to adaptive software and technology as yet.

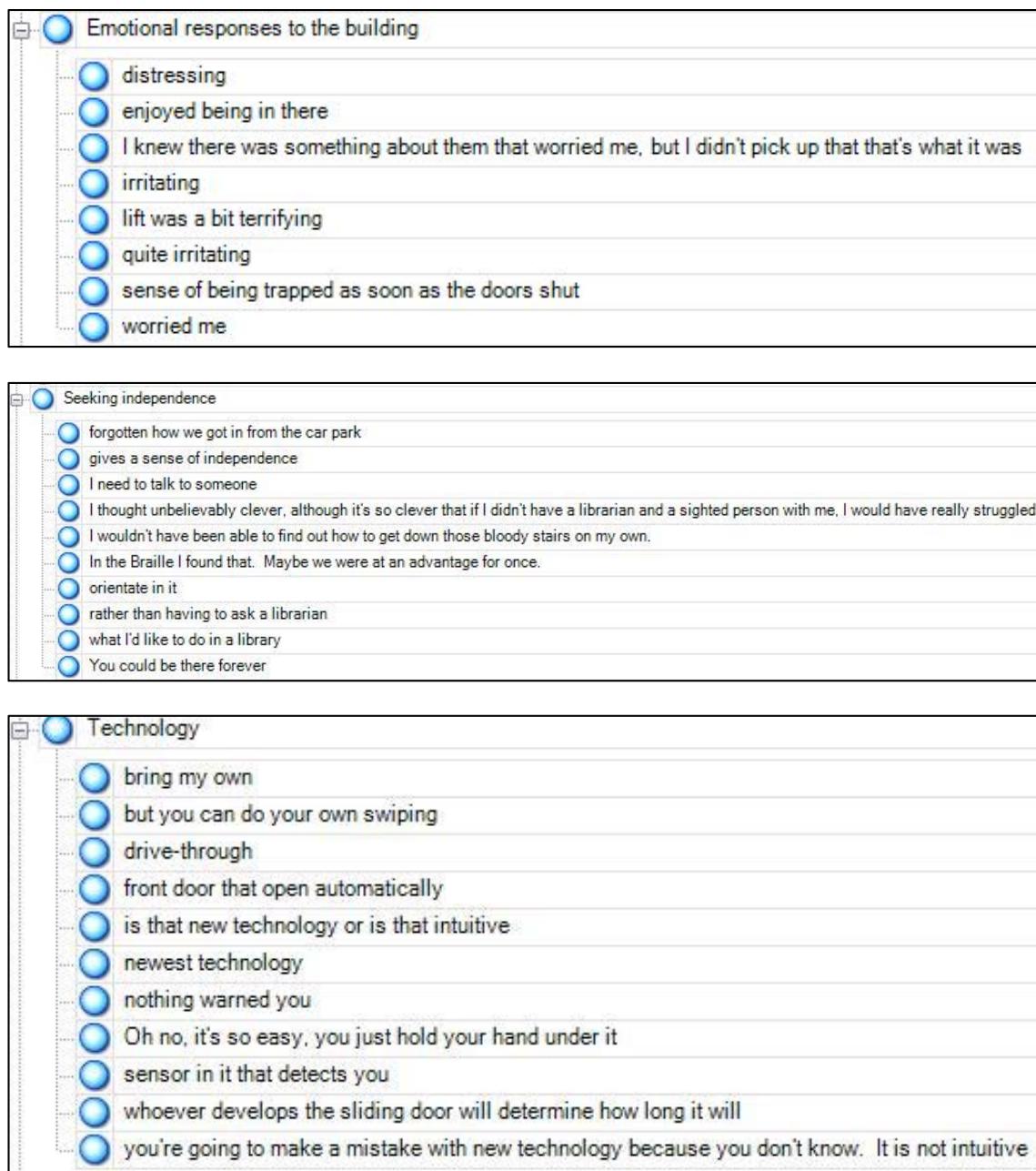
Considering access issues for disabled people overall, is there anything you would like to comment on?

Note: The Universal Design Principles (word document) was included.

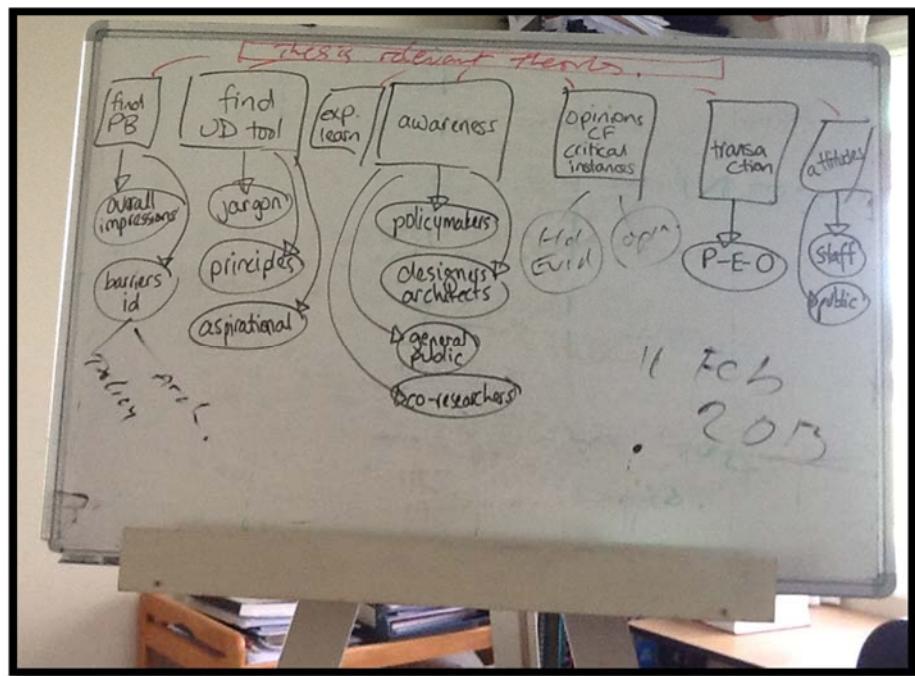
## Appendix U – Example of Categories of Child Nodes

changes over time
chief librarian
children couldn't reach them and destroy them
choosing which table to go to
circulation space
complaints
complete lack of signage
consumers in their own right, drop off as opposed to people who work for agencies.
convention course which is the Organisation of Disabled People's Organisations
Convention of Elimination of Discrimination Against Women
could be sorted
Could you do it another way~
Could you make it easier to use~
Counties District Health Board
dealing with the principles, is it's a striving thing, you can always improve.
didn't always go with the flow
didn't have any of that qualitative
difficulty moving
Disability Discrimination Act
distressing
Do people get dismayed
do some of the drafting of submissions and things
do they make the design appealing to all users~ Well was that visual or functionally~
do we encourage "learn to"
do we look at coming up with a tool that's actually useful~
do you do away with the yes~no completely and just have comments~
doors closed too quickly
drive-through
elderly parents

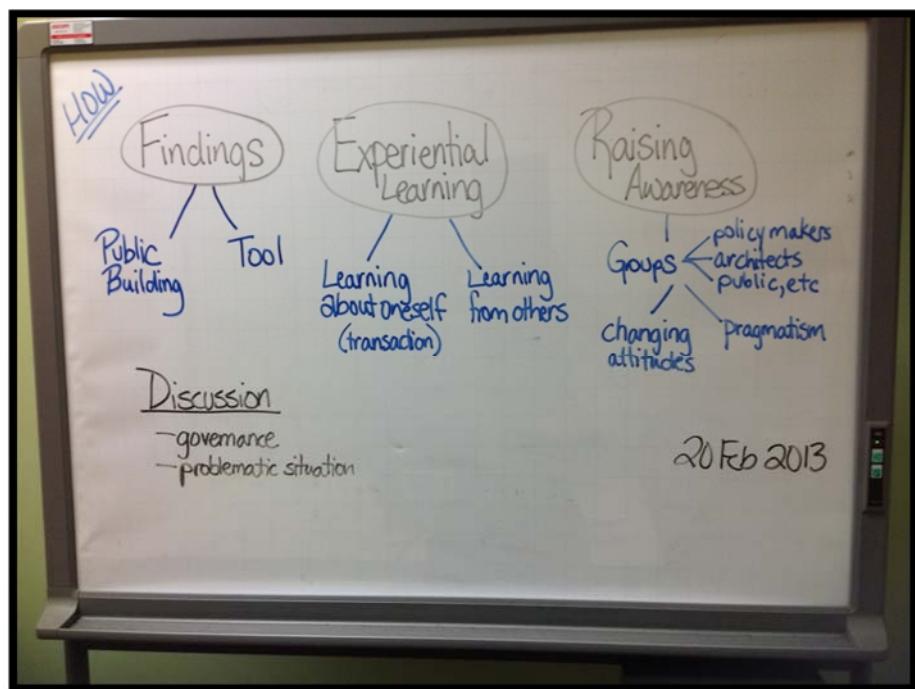
## Appendix V – Example of Categories of Parent and Associated Child Nodes



## Appendix W – Examples of Deductive Construction of Themes



Photographer: Jenni Mace, ©2013.



Photographer: Elise Copeland, ©2013.

## **Appendix X – Sample Reflection**

### **Reflection on meeting 1 (Fish, et al., 1991)**

02/02/12

#### The factual strand

Seven research participants and the researcher met as a group for the first time in AD building at AUT North Shore. While the researcher had personally met and spoken to all of the participants only three of the participants knew each other previously.

The meeting progressed through six stages – welcome, introduction, group ground rules, global context, personal narratives and beginning to explore the universal design principles. The first four stages took longer than expected, the latter two stages were quicker than expected.

Significant critical incident – disagreement about the meaning of the word – universal. While I initially did not want to get ‘caught up’ debating terminology, I did realise the importance of the debate and tried to understand both views, though may have ‘sided’ with one participant over another.

Significant critical incident – one participant left approx. 20 min early. Offered assistance, politely declined, appeared to be of a personal nature. One participant supported this person while I continued with the group.

#### The retrospective strand

As this is a new community that is forming, additional time/space may be needed to establish bonds as a group. As three people in the group knew each other previously this may have impacted upon those who did not know anyone within the group.

The debate may have highlighted a philosophical divide between the disability community and people who are able bodied. Differing views on issues are likely to continue to present themselves; need to review management of disagreement/conflict.

While the participant appeared to leave early for personal reasons, there is also a question of comfort level, both physically and psychologically. While in private conversation she was very outgoing, she appeared a bit withdrawn within the group. Query whether intimidation from people ‘working in the sector’ or significant educational background. Jargon needs to be avoided (i.e. UNCRPD).

### The substratum strand

Further consideration could have been given to placement of individuals around the table. While child was placed away from near corners, which meant pram was in the hall. Guide dog got knocked several times. Able bodied needed to negotiate over/around obstacles. I sat at ‘head’ of table which may have implicitly confirmed my role as ‘leader’ rather than ‘facilitator’. This may have been further enforced through ‘info-giving’.

The custom of turn taking appeared to be largely adhered to and participants did not seem to talk over one another. There may, however, appear to have additional time/weight given to the narratives of people with disabilities as compared to those without disabilities.

There was some discussion of ‘how easy the environment should be’, but not a clarification of what the group of individuals felt about this idea – would benefit from being re-visited – meeting 2 or 3.

### The connective strand

Greater attention needs to be paid to the process – encouraging the development of relationships and that all ideas and perceptions are valid.

Greater attention needs to be paid to the environment – from too hot, to too small to placement of participants to placement of facilitator. Change in the environment can have a significant impact on interactions.

The assumption (implicit) that able bodied people do not face environmental barriers or that they should simply overcome them may need to be challenged. The idea of ‘how easy the environment needs to be’ warrants further discussion.

I have learned that I can at times be more ‘task focussed’ than ‘process focussed’ and need to strive for greater balance between the two.

Fish, D., Twinn, S., & Purr, B. (1991). *Promoting reflection: Improving the supervision of practice in health visiting and initial teacher training*. London, UK: West London Institute of Higher Education.

## **Appendix Y – Preliminary Findings of the Universal Design Assessment of the Birkenhead Library**

Distributed to co-researchers at the 5<sup>th</sup> meeting for member checking

### **Universal design assessment of the Birkenhead library**

Areas of high consensus (7/8)

- Low physical effort of the entrances and exits
- Poor size and space for approach and use of the public amenities
- Low physical effort in the circulation systems
- Flexibility in obtaining a product or service

Areas of moderately high consensus (6/8)

- Simple and intuitive use of the entrances and exits
- Good size and space for approach and use of the entrances and exits
- No tolerance for error in the circulation systems

Frequent comments:

- Child gate – lack of ease of use/physical effort needed (4), lack of intuitive use (2)
- Signage – lack of perceptible signage primarily visual (5), lack of line of sight/poor placement (3)
- Public amenities – physical effort required (5)
- Shelving/returns – too high/uncomfortable reach (4)
- Lift –lack of space (4), lack of simple, intuitive & perceptible signage (3), lack of hazard minimisation (2)
- Toilets – lack of space (4), lack of amenities (3)
- Stairs – accommodate left/right handed use (4), tactile warnings present on stairs (3)

## **Appendix Z – Goals of Universal Design**

### **Goals of Universal Design (Steinfeld & Maisel, 2012)**

Body Fit – Accommodating a wide range of body sizes and abilities

Comfort – Keeping demands within desirable limits of body function

Awareness – Ensuring that critical information for use is easily perceived

Understanding – Making methods of operation and use intuitive, clear, and unambiguous

Wellness – Contributing to health promotion, avoidance of disease, and prevention of injury

Social Integration – Treating all groups with dignity and respect

Personalization – Incorporating opportunities for choice and the expression of individual preferences

Cultural Appropriateness – Respecting and reinforcing cultural values and the social and environmental context of any design project

## **Appendix AA – Feedback Provided to the Birkenhead Library**

Universal Design Research Group  
C/o Elise Copeland  
Department of Occupational Science & Therapy  
AUT University  
Private Bag 92006  
Auckland 1142

April 27, 2014

Properties Asset Manager  
Auckland Council

In February 2012, under the guidance of Elise Copeland, an occupational therapist and a Masters in Health Science student at AUT, a co-research group was established to progress action research in the area of Universal Design. This group consists of 7 Auckland based members of the community, with a diverse range in background, knowledge levels about Universal Design, age and ability. One group member identifies as being elderly, five as disabled, one as a mother, experiencing access and design issues and one other as skilled in research in general.

Of the five disabled people in the group three have sensory impairments and the other two members have a physical impairment. Three of the five disabled co-researchers also work as Disability Advisors at Auckland Council, while the one person who identifies as a mother, experiencing access issues when accompanied by her baby, is affiliated with Women's Health Action Trust. Other Co-researchers have links with various community organisations including: Age Concern, CCS Disability Action and Never too old.

Universal Design is “the design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design” (Mace, 1985). As part of this research project, co-researchers trialled a research tool which assesses the success of building design according to Universal Design Principles (Connell et al., 1997).

The Universal Design Principles are considered to be useful guidelines to: “evaluate existing designs, guide the design process and educate both designers and consumers about the characteristics of more usable products and environments” (Connell et al., 1997).

Table 1 The principles of universal design (Connell et al., 1997)

Principle	Description
Equitable use	The design is useful and marketable to people with diverse abilities.
Flexibility in use	The design accommodates a wide range of individual preferences and abilities.
Simple and intuitive use	Use of the design is easy to understand, regardless of the user's experience, knowledge, language skills, or current concentration level.
Perceptible information	The design communicates necessary information effectively to the user, regardless of ambient conditions or the user's sensory abilities.
Tolerance for error	The design minimizes hazards and the adverse consequences of accidental or unintended actions.
Low physical effort	The design can be used efficiently and comfortably and with a minimum of fatigue.
Size and space for approach and use	Appropriate size and space is provided for approach, reach, manipulation, and use regardless of user's body size, posture, or mobility.

Please refer to the attached Appendix A for a full text version of the principles.

The universal design assessment tool was adapted from a research study by Afacan and Erbug (2009) and assesses five domains of a public building: entrances and exits, public amenities, circulation, wayfinding, and obtaining a product or service. We present to you the findings of our assessment of the Birkenhead Public Library with group recommendations for consideration.

### Entrances and exits

The entrances and exits at Birkenhead library were found to meet three of the seven universal design principles by the majority of the co-researchers. This included that they were simple and intuitive to use, required low physical effort to use and that there was good size and space for approach and use. Several co-researchers noted, however, that the main entrance was not adequately sign-posted or perceptible, and that the security gates inside the main entrance narrowed the available space quite significantly.

### Public amenities

The public amenities were reported not to meet several universal design principles including: low physical effort and size and space for approach and use. The toilet doors were reported to be significantly heavy by several co-researchers, navigating the narrow entrances to the toilets were reported to be difficult, and space within the toilets was reported to be too small for some co-researchers.

### Circulation

Circulation within the library was found to require low physical effort as reported by the majority of co-researchers. The stairs were noted to meet several universal design principles including: flexibility in use and perceptible information. Having stair rails both sides accommodates left or right handed use and the tactile warnings provide perceptible information.

The lift, however, was found to not meet a number of universal design principles including: simple and intuitive use, perceptible information, tolerance for error and size and space for approach and use. There was found to be no signage within the lift to indicate what is found on each floor of the library, and the floor indicators included letters such as "M" which was not considered to be intuitive. There were no audible indications of which floor one was on or which set of doors were opening, which could present a safety hazard. The lift was found to be too small by some co-researchers.

The child gate at the top of the stairs was also problematic for some co-researchers. It was found not to meet several universal design principles including: simple and intuitive use and low physical effort. Many co-researchers commented that it was not intuitive for there to be a gate at the top of a set of stairs and that the gate was difficult to operate.

### Wayfinding

Wayfinding presented problems for a majority of the co-researchers. From discerning which lift took you to which area, to finding which part of the library to look for items was considered to be difficult. While the existing signage was acknowledged, it was found not to meet the following universal design principles: perceptible information and size and space for approach and use. The majority of signage is visual which presents difficulties for people with low vision. In addition, line of sight was blocked on a number of signs, some due to location, and some due to notice boards/pamphlets in the way of reading the permanent signage.

### Obtaining a product or service

The majority of co-researchers agreed that the universal design principle flexibility in use was met with respect to obtaining a product or service. There was noted to be several methods of checking out or returning library items. The shelving and returns drop, however, was reported to be too high by some of the co-researchers.

### Summary

In summary, co-researchers found the Birkenhead library – light, bright and airy and reported that the outside area was a very nice feature. They commented that the library staff were approachable and helpful. Co-researchers agreed that the library was generally accessible, though there are additional steps that can be taken to make it more universally designed.

## Recommendations

### **Short term**

Safety hazard – It was noted that there is a safety hazard that people could hit their heads on the underside of the staircases. It is recommended that this is urgently addressed and this has been noted by library staff. Recommendations include: placing trolleys under the open area under the stairs and foam or another protective material be applied to the metal staircase to lessen the impact of any potential injury.

Signage – Wayfinding was noted to be difficult for a majority of the co-researchers and it is recommended that this is addressed. Please refer to the attached guidelines on signage and spatial orientation. It is recommended that the library consider a map at the front entrance and printing a brochure map of the library for patrons which can indicate where library items and amenities are located throughout the library. Consider consultation with users in the development of new signage.

Toilets – It is recommended that the toilet doors and flush mechanisms be reviewed to see if there are ways that they could be altered to require less physical effort to operate. It is recommended that consideration is given to a chair for toddlers in the family room. It is recommended that parents with toddlers are consulted with respect to this.

Obtaining a product or service – It is recommended that the lowered check out desk is cleared of all pamphlets to enable library patrons, including children and wheelchair users, to use this lowered check out desk. It is recommended that investigations are completed with respect to NVDA (NonVisual Desktop Access) software, which enables users with low vision to operate computers: <http://www.nvda-project.org/>.

### **Medium term**

Shelving – Shelving was noted to be difficult to reach for some of the co-researchers. Please refer to the attached guideline on comfortable reach.

Security gates – The security gates were noted to narrow the otherwise large entrance and were reported to feel imposing by their height and design. It is recommended that investigations are completed to widen the security gates and consider sourcing gates that are perceived to be

less intimidating. Consider consultation with users in the choosing of alternative gates.

Children's area – Several co-researchers have noted that it does not appear to be intuitive to have the children's area located upstairs. This requires parents with prams to be heavy users of the sole lift, and requires the not intuitive and difficult to use child gate at the top of the stairs. In addition, the balcony could pose a safety hazard for some children. In the medium term, it is recommended that the library consider re-locating the children's area downstairs. Consider consultation with children and their parents.

### **Long term**

It was also noted that some structural elements, including the toilets and lifts, were unfortunately not designed large enough to accommodate some library users. When the library is undergoing substantial renovation or change in use, it is recommended that these structural features are reviewed to be made larger and more universally designed. Collaboration with users is essential.

The person to contact regarding further enquiries regarding this feedback is:

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## Appendix A: UNIVERSAL DESIGN:

The design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design.

The authors, a working group of architects, product designers, engineers and environmental design researchers, collaborated to establish the following Principles of Universal Design to guide a wide range of design disciplines including environments, products, and communications. These seven principles may be applied to evaluate existing designs, guide the design process and educate both designers and consumers about the characteristics of more usable products and environments.

The Principles of Universal Design are presented here, in the following format: name of the principle, intended to be a concise and easily remembered statement of the key concept embodied in the principle; definition of the principle, a brief description of the principle's primary directive for design; and guidelines, a list of the key elements that should be present in a design which adheres to the principle. (Note: all guidelines may not be relevant to all designs.)

### **PRINCIPLE ONE: Equitable Use**

The design is useful and marketable to people with diverse abilities.

#### **Guidelines:**

- 1a. Provide the same means of use for all users: identical whenever possible; equivalent when not.
- 1b. Avoid segregating or stigmatizing any users.
- 1c. Provisions for privacy, security, and safety should be equally available to all users.
- 1d. Make the design appealing to all users.

### **PRINCIPLE TWO: Flexibility in Use**

The design accommodates a wide range of individual preferences and abilities.

**Guidelines:**

- 2a. Provide choice in methods of use.
- 2b. Accommodate right- or left-handed access and use.
- 2c. Facilitate the user's accuracy and precision.
- 2d. Provide adaptability to the user's pace.

**PRINCIPLE THREE: Simple and Intuitive Use**

Use of the design is easy to understand, regardless of the user's experience, knowledge, language skills, or current concentration level.

**Guidelines:**

- 3a. Eliminate unnecessary complexity.
- 3b. Be consistent with user expectations and intuition.
- 3c. Accommodate a wide range of literacy and language skills.
- 3d. Arrange information consistent with its importance.
- 3e. Provide effective prompting and feedback during and after task completion.

**PRINCIPLE FOUR: Perceivable Information**

The design communicates necessary information effectively to the user, regardless of ambient conditions or the user's sensory abilities.

**Guidelines:**

- 4a. Use different modes (pictorial, verbal, tactile) for redundant presentation of essential information.
- 4b. Provide adequate contrast between essential information and its surroundings.
- 4c. Maximize "legibility" of essential information.
- 4d. Differentiate elements in ways that can be described (i.e., make it easy to give instructions or directions).
- 4e. Provide compatibility with a variety of techniques or devices used by people with sensory limitations.

## **PRINCIPLE FIVE: Tolerance for Error**

The design minimizes hazards and the adverse consequences of accidental or unintended actions.

### **Guidelines:**

- 5a. Arrange elements to minimize hazards and errors: most used elements, most accessible; hazardous elements eliminated, isolated, or shielded.
- 5b. Provide warnings of hazards and errors.
- 5c. Provide fail safe features.
- 5d. Discourage unconscious action in tasks that require vigilance.

## **PRINCIPLE SIX: Low Physical Effort**

The design can be used efficiently and comfortably and with a minimum of fatigue.

### **Guidelines:**

- 6a. Allow user to maintain a neutral body position.
- 6b. Use reasonable operating forces.
- 6c. Minimize repetitive actions.
- 6d. Minimize sustained physical effort.

## **PRINCIPLE SEVEN: Size and Space for Approach and Use**

Appropriate size and space is provided for approach, reach, manipulation, and use regardless of user's body size, posture, or mobility.

### **Guidelines:**

- 7a. Provide a clear line of sight to important elements for any seated or standing user.
- 7b. Make reach to all components comfortable for any seated or standing user.
- 7c. Accommodate variations in hand and grip size.
- 7d. Provide adequate space for the use of assistive devices or personal assistance.

Please note that the Principles of Universal Design address only universally usable design, while the practice of design involves more than consideration for usability. Designers must also incorporate other considerations such as economic, engineering, cultural, gender, and environmental concerns in their design processes. These Principles offer designers guidance to better integrate features that meet the needs of as many users as possible.

## Background

Version 2.0 – 4/1/97

Compiled by advocates of universal design, listed in alphabetical order:  
Bettye Rose Connell, Mike Jones, Ron Mace, Jim Mueller, Abir Mullick,  
Elaine Ostroff, Jon Sanford, Ed Steinfeld, Molly Story, and Gregg  
Vanderheiden

Major funding provided by: The National Institute on Disability and Rehabilitation Research, U.S. Department of Education

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Note: Three additional appendices were provided:

- DR #11: Text Legibility and Readability of Large Format Signs in Building and Sites
- DR #14: Spatial Orientation, Environmental Perception and Wayfinding
- DR #20: Functional Reach Capability for Wheeled Mobility Users

All are available from Idea Center, University of Buffalo: <http://idea.ap.buffalo.edu/>

## Appendix AB – Findings from the Universal Design Assessment

The universal design assessment was adapted with permission from Afacan and Erbug's (2009) Task scenarios. The assessment breaks down a building into five areas: entrances and exits, circulation systems, wayfinding, obtaining a product or service and public amenities. In each of these five areas, guiding questions are given for the assessor to consider each of the seven universal design principles in turn. For example, using all the entrances/exits in each floor regarding their equitable use, flexibility in use, simple and intuitive use, etc. The co-researchers were requested to circle either yes or no to each principle. There was space for them to write comments beside each of the principles. Refer to Appendix E for a copy of the tool.

Co-researchers assessed the Birkenhead Public Library following the second research meeting and prior to the fourth research meeting, a period of two weeks. Participants took between one and two hours to complete the assessment.

### **Responses based on question**

	Type of disability									Comments	
	Physical			Sensory			N/A				
	Y	N	U	Y	N	U	Y	N	U		
<b>Entrances/exits</b>											
Equitable use	2			2	1		1	2		Yes - Appealing design x 2, Safety (flat entrance) No - Safety concern (lip at front entrance), Lack of equity (lift only way of accessing upper level for some users), Not appealing (detection monitors visually threatening)	
Flexibility in use	1	1		1	2		1	2		Yes - Adapt to user's pace No - Lack of ease of use x 2 (dexterity for child gate), Does not adapt to user's pace (maintenance needed)	
Simple & intuitive use	2			2	1		2	1		Yes - Safety (half sized door closes automatically) No - Not intuitive (child gate not marked, entrance not next to returns), Lack of ease of use (child gate)	
Perceptible information	2			1	2		1	2		Yes - Signage (good signage from street edge) No - Lack of necessary information x 4 (location of entrance not clear, lack of signage for underground parking, lack of tactile signage)	

	Type of disability									Comments	
	Physical			Sensory			N/A				
	Y	N	U	Y	N	U	Y	N	U		
Tolerance for error	2				3		2	1		No - Lack of hazard warnings (no audio warnings), Lack of hazard minimisation (head clearance under stairs)	
Low physical effort	2			2	1		3			Yes - Lack of physical effort x 2 (automatic sliding doors, flat approach) No - Physical effort x 2 (child gate), Safety concern (cobbles uneven)	
Size & space	2			1	2		3			No - Lack of necessary information (location of entrance not clear), Lack of space x 3 (security gates narrow entrance, busy front entrance with people returning books, pathways between furniture too narrow), Safety (computer stools too high)	
<b>Public amenities</b>											
Equitable use	2			1	2		2	1		Yes - Appealing design x 2 (upstairs balcony) No - Size (toilets not large enough), Lack of information x 3 (only visual, accessible toilet poorly signed), Segregation (accessible toilet separate)	
Flexibility in use	2			1	2		3			No - Lack of amenities x 3 (table, baby changing area, one rail only in accessible toilet), Poor information placement x 2 (too high), Lack of space (seating too close to shelves), Lack of choice in use (unable to adjust computer to suit height/vision)	
Simple & intuitive use	2			2	1		1	2		Yes - Intuitive (taps, driers) No - Information importance (toilet poorly signed), Physical effort (bathroom door stiff)	
Perceptible information	1	1	2	1			1	2		Yes - Perceptible doors No - Lack of perceptible signage x 4 (primarily visual, location), Poor lighting (accessible toilet)	

	Type of disability									Comments	
	Physical			Sensory			N/A				
	Y	N	U	Y	N	U	Y	N	U		
Tolerance for error	1		1	2	1		1	2		No - Safety (pathways too narrow), No fail safe features (e.g. call button/pull cord in toilet)	
Low physical effort	1	1		1	2		1	2		Yes - Neutral body position x 2 (seating varied, desks have good leg space) No - Physical effort x 5 (toilet door too heavy, sofas too low, toilet flush buttons stiff)	
Size & space		2		1	2			3		No - Lack of space x 4 (lack of space in toilets, small space in meeting rooms), Reach x 2 (shelves too high), Poor line of sight x 3 (information displays, public catalogues not always well located)	
Circulation systems											
Equitable use	1			1	1	1	1	2		Yes - Safety (contrast on stairs, tactile warnings, Braille, ground buttons) No - Means of use x 2 (some use stairs, some lift), Safety (child barrier on one set of stairs only)	
Flexibility in use	1			1	1	2	1	2		Yes - Accommodate right/left use x 4 (handrails both sides of stairs), Adapt to user's pace (lift doors open for long time) No - Lack of adapt to user's pace (lift doors close too quickly), Lack of space (too narrow in lift), Lack of accommodation right/left use (buttons in lift, handrails one side)	
Simple & intuitive use	2			2	1			3		Yes - Perceptible information (tactile changes in flooring) No - Lack of simple & intuitive signage x 3 ("M" in lift for mezzanine), Lack of intuitive use x 2 (glass gate at top of stairs)	

	Type of disability									Comments	
	Physical			Sensory			N/A				
	Y	N	U	Y	N	U	Y	N	U		
Perceptible information	1			1	2			3		Yes - Maximise legibility (signage in lifts, handrail in lift) No - Lack of necessary information x 3 (separate lift to basement, no audio signals for doors opening/closing or lift going up/down, minimal signage in lift, minimal signage by stairs), Safety (unclear which doors will open)	
Tolerance for error	2				3			3		Yes - Warnings of hazards x 2 (tactile sensors top of stairs), Fail safe features x 2 (handrails on stairs, grip on stairs) No - Lack of hazard minimisation x 2 (lift doors close too quickly, no audio signals for doors opening/closing, doors may open either side, head clearance under stairs)	
Low physical effort	2			2	1		3			No - Lack of neutral body position (to operate lift buttons), Safety (lack of warning markers at foot of stairs)	
Size & space	2			1	2		1	2		Yes - Space x 2 (great space in lift, corridors wide enough), Clear line of sight (visible signage) No - Lack of space x 3 (lack of space in lift), Lack of space for approach (to stairs), Lack of comfortable reach (handrails too high)	

	Type of disability									Comments	
	Physical			Sensory			N/A				
	Y	N	U	Y	N	U	Y	N	U		
<b>Wayfinding</b>											
Equitable use	2				3		1	2		No - Lack of equity x 2 (human assistance required), Lack of signage x 2, Not logical (wayfinding not in a straight line)	
Flexibility in use	2				3		1	2		No - Lack of choice in methods of use x 2 (no verbal sign-posts), Lack of facilitation of precision (no auditory or tactile cues to reception)	
Simple & intuitive use	2			1	2		1	2		Yes - Space (good with of corridors), Safety (able to find and access exits easily), Communicate necessary information (children's footsteps to lift) No - Lack of clear signage, Lack of intuitive placement (library returns outside)	
Perceptible information	2			1	2		1	2		Yes - Good lighting x 2 No - Lack of communication of necessary information x 3 (lack of verbal sign posts, tactile signage, no signage with whole building layout, no leaflets with layout)	
Tolerance for error	2			1	2		1	2		Yes - Warnings of hazards (tactile warnings for stairs) No - Lack of warnings of hazards (no tactile warnings at bottom of stairs)	
Low physical effort	2				3		2	1		No - Repetitive movement x 2 (having to ask directions, lack of signage)	
Size & space		1	1	1	2		2	1		Yes - Adequate space (at tables, corridors) No - Lack of wayfinding elements x 2, Lack of clear line of sight x 2 (information on notice board)	

	Type of disability								Comments	
	Physical			Sensory			N/A			
	Y	N	U	Y	N	U	Y	N	U	
Obtaining product/service										
Equitable use	2			3		1	2			Yes - Availability of assistance No - Lack of equity x 2 (personal assistance needed to obtain materials), Lack of privacy (have to share what books desired if assistance needed), Physical effort (shelves too high), Lack of access to receptionist x 2 (lowered front desk covered in leaflets), Space (narrow corridors between shelves)
Flexibility in use	2			2	1		3			Yes - Choice in use x 2 (drive through option to return books, access to meeting rooms) No - Lack of choice in methods of use x 3 (lack of access to lowered receptionist desk, mezzanine help desk unmanned)
Simple & intuitive use	2			2	1		1	1	1	Yes - Attitude (friendly receptionist) No - Not intuitive x 2 (electronic checkout could be made more accessible, directions not provided for automatic checkouts, assistants switch between desks which can be confusing)
Perceptible information	2				2		2	1		No - Lack of compatibility with devices x 2 (no assistive software on computers)
Tolerance for error	1	1		2	1		2		1	Yes - Personal assistance (warned of hazards) No - Lack of space, Lack of minimising hazards (stools could be falls risk)
Low physical effort	2			1	2		2			Yes - Neutral body position (low level books in children's area) No - Repetitive actions (lack of software, need for assistance), Lack of space

	Type of disability									Comments	
	Physical			Sensory			N/A				
	Y	N	U	Y	N	U	Y	N	U		
Size & space		1	1	1	2		2	1		Yes - Clear line of sight and access to help desk No - Lack of comfortable reach x 4 (shelves too high, return slot high), Lack of space	

## **Appendix AC – Oral Presentation on the Auckland Transport Plan**

### **Oral submission – LTP1205429 – Universal Design Research Group**

*Not being able to go out in the community is like having a day with no sunshine.*

Hello, my name is Elise and this is Isis and we are co-researchers with a group of Auckland citizens exploring the concept of universal design.

#### **What is universal design?**

Universal design is “the design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design” (Mace, 1985). Please refer to the handout for the universal design principles (The Centre for Universal Design, 1997). These seven principles, compiled in 1997, are considered useful guidelines in the design of usable products and environments.

*Not being able to go out in the community is like having a day with no sunshine.*

One of the co-researchers said this to me when I asked why she was interested in participating in this research study. This quote demonstrates how vitally important it is that transport is designed in such a way to enable all citizens of Auckland access to their communities – to live, to work and to play. This participant, like many other Aucklanders, is unable to drive and is reliant on public transport systems. With New Zealand’s rapidly ageing population – with 27% of the population anticipated to be 65 or older by the later part of the 21st century (Statistics New Zealand, 2009), it is imperative that future transport systems are designed with a wide range of user needs in mind.

*I don't realise I have a disability until the environment makes me aware of it.*

Another co-researcher said this when discussing barriers experienced in the environment. This co-researcher has hearing impairment and on one day did not have working hearing aids while she was sitting on an Auckland city train, as she often did for transport for work. Realising that

the train appeared to be delayed, she looked around at the other passengers; they appeared to be listening to an announcement. She thought to herself – if it is important, they surely will write a message on the overhead computerised signage. However, as all the other passengers filed off the train, she had to approach staff and with great difficulty find out that her train had been changed and was leaving from a different platform altogether. Had she stayed reading her work documents, she would have ended up in another location entirely. So it is important that not only are the systems designed well in the first place, but that they are used to their best advantage to support all citizens of Auckland.

That brings us to little Brae. As I am sure all parents, grandparents, aunts and uncles know, children are a joy to any family. However, having a child, particularly in a pram, does highlight the inaccessibility of many environments to people who have never experienced disability. While many Auckland city buses now have kneeling features, it is not uncommon for passengers to experience frustration with bus drivers that do not know how to operate them or are having to operate their bus to such a tight timeframe that they are unable to offer assistance to those that need it. Isis is lucky enough at this time to just have a single pram, for mothers with multiples, managing a double or even triple pram is near to impossible with our current public transport system.

It doesn't have to be so. **What is the answer?**

Universal design. In the planning of all current and future transport projects such as revitalising public transport, use the universal design principles as a guide (The Centre for Universal Design, 1997).

Some specific **recommendations** include:

*Participatory processes* with users and experts to design transport systems:

- Users have valuable experiential knowledge through their interactions with transport systems, though this knowledge is often overlooked by professionals.

*Perceptible information:*

- Tactile maps at station entrances, lobbies and platforms

- Detectable guide strips from station entrances to lobby, fare booths and platforms
- Audio and visual information on platforms and in trains/buses

*Low physical effort:*

- Level access to trains with minimal gap between the train and the platform

*Size and space for approach and use:*

- Ample floor space for bikes, prams, wheelchairs and luggage

Specific universal design case study exemplars for transportation may be found at the Institute for Human Centred Design (IHCD) website (IHCD, 2009). These include examples from Japan, France and Denmark. The long term benefits of accessible transportation can be clearly seen in cities such as Denver, Colorado in the US, where barrier free public transportation was introduced in 1978 (Independent Living Management, 2001). Many disabled people as well as those without disabilities are seen to be using public transport and engaging in their community (personal communication, V. Wright St-Clair, occupational therapist).

Auckland has as its goal to become the world's most livable city, let us make it a universally designed one.

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## **Appendix AD – Feedback Received from the Principal Architect of Birkenhead Library**

April 27, 2014

Brendan Rawson

Architect, Archoffice

1a, 47 Brown St., Ponsonby, Auckland

Dear Brendan:

In February 2012, under the guidance of Elise Copeland, an occupational therapist and a Masters in Health Science student at AUT, a co-research group was established to progress action research in the area of Universal Design. This group consists of 7 Auckland based members of the community, with a diverse range in background, knowledge levels about Universal Design, age and ability. One group member identifies as being elderly, five as disabled, one as a mother, experiencing access and design issues and one other as skilled in research in general.

Of the five disabled people in the group three have sensory impairments and the other two members have a physical impairment. Three of the five disabled co-researchers also work as Disability Advisors at Auckland Council, while the one person who identifies as a mother, experiencing access issues when accompanied by her baby, is affiliated with Women's Health Action Trust. Other Co-researchers have links with various community organisations including: Age Concern, CCS Disability Action and Never too old.

Universal Design is “the design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design” (Mace, 1985). As part of this research project, co-researchers trialled a research tool which assesses the success of building design according to Universal Design Principles (Connell et al., 1997).

The Universal Design Principles are considered to be useful guidelines to: “evaluate existing designs, guide the design process and educate both designers and consumers about the characteristics of more usable products and environments” (Connell et al., 1997).

Table 1 The principles of universal design (Connell et al., 1997)

Principle	Description
Equitable use	The design is useful and marketable to people with diverse abilities.
Flexibility in use	The design accommodates a wide range of individual preferences and abilities.
Simple and intuitive use	Use of the design is easy to understand, regardless of the user's experience, knowledge, language skills, or current concentration level.
Perceptible information	The design communicates necessary information effectively to the user, regardless of ambient conditions or the user's sensory abilities.
Tolerance for error	The design minimizes hazards and the adverse consequences of accidental or unintended actions.
Low physical effort	The design can be used efficiently and comfortably and with a minimum of fatigue.
Size and space for approach and use	Appropriate size and space is provided for approach, reach, manipulation, and use regardless of user's body size, posture, or mobility.

Please refer to the attached Appendix A for a full text version of the principles.

The universal design assessment tool was adapted from a research study by Afacan and Erbug (2009) and assesses five domains of a public building: entrances and exits, public amenities, circulation, wayfinding, and obtaining a product or service. We present to you the findings of our assessment of the Birkenhead Public Library with group recommendations for consideration.

Elise, thanks for this -my comments in red below

#### Entrances and exits

The entrances and exits at Birkenhead library were found to meet three of the seven universal design principles by the majority of the co-researchers. This included that they were simple and intuitive to use, required low physical effort to use and that there was good size and space for approach and use. Several co-researchers noted, however, that the main entrance was not adequately sign-posted or perceptible, and that the security gates inside the main entrance narrowed the available space quite significantly.

**Comment:** Due to council amalgamation at the time the Library was completed signage was not deployed as intended by the designers on the building frontage. The security gates and their position relative to the entry are designed to ensure books cannot be passed out through

that area and form the security perimeter. They are standard design for all libraries in most places.

#### Public amenities

The public amenities were reported not to meet several universal design principles including: low physical effort and size and space for approach and use. The toilet doors were reported to be significantly heavy by several co-researchers, navigating the narrow entrances to the toilets were reported to be difficult, and space within the toilets was reported to be too small for some co-researchers.

**Comment:** The toilets are designed to, and meet the current building code requirements. Elements are designed to be vandal resistant .

#### Circulation

Circulation within the library was found to require low physical effort as reported by the majority of co-researchers. The stairs were noted to meet several universal design principles including: flexibility in use and perceptible information. Having stair rails both sides accommodates left or right handed use and the tactile warnings provide perceptible information.

The lift, however, was found to not meet a number of universal design principles including: simple and intuitive use, perceptible information, tolerance for error and size and space for approach and use. There was found to be no signage within the lift to indicate what is found on each floor of the library, and the floor indicators included letters such as "M" which was not considered to be intuitive. There were no audible indications of which floor one was on or which set of doors were opening, which could present a safety hazard. The lift was found to be too small by some co-researchers.

**Comment:** The public can only access one level at a time using one lift. This is designed so that the lift from the basement carpark discharges outside the book security perimeter with the second lift only providing access to and from the mezzanine floor within the security perimeter. The lift from the basement carpark allows courier access (but not public) to the workroom so if the public use the lift only one set of doors open which take them into the main entry. Signage is difficult to deploy to overcome this .

The child gate at the top of the stairs was also problematic for some co-researchers. It was found not to meet several universal design principles including: simple and intuitive use and low physical effort. Many co-researchers commented that it was not intuitive for there to be a gate at the top of a set of stairs and that the gate was difficult to operate.

**Comment:** The designers never intended a gate to be deployed at the top of the stairs or for this floor to have the childrens area. This was added by the Library manager to meet parent concerns about saftey of toddlers in the childrens area playing close to the stairs. The designers did not want the childrens area located on the mezzanine, preferring instead for it to be located on the ground floor closer to plunket for the obvious synergies but were over ruled by libraries.

## Wayfinding

Wayfinding presented problems for a majority of the co-researchers. From discerning which lift took you to which area, to finding which part of the library to look for items was considered to be difficult. While the existing signage was acknowledged, it was found not to meet the following universal design principles: perceptible information and size and space for approach and use. The majority of signage is visual which presents difficulties for people with low vision. In addition, line of sight was blocked on a number of signs, some due to location, and some due to notice boards/pamphlets in the way of reading the permanent signage.

**Comment:** Our advice was to limit the shelving height to 1500mm not 1800mm which was installed by Libraries. This was to allow line of sight thruout the library and lower stacking height for books.

## Obtaining a product or service

The majority of co-researchers agreed that the universal design principle flexibility in use was met with respect to obtaining a product or service. There was noted to be several methods of checking out or returning library items. The shelving and returns drop, however, was reported to be too high by some of the co-researchers.

## Summary

In summary, co-researchers found the Birkenhead library – light, bright and airy and reported that the outside area was a very nice feature. They commented that the library staff were approachable and helpful. Co-researchers agreed that the library was generally accessible, though there are additional steps that can be taken to make it more universally designed.

## Recommendations

### **Short term**

Safety hazard – It was noted that there is a safety hazard that people could hit their heads on the underside of the staircases. It is recommended that this is urgently addressed and this has been noted by library staff. Recommendations include: placing trolleys under the open area under the stairs and foam or another protective material be applied to the metal staircase to lessen the impact of any potential injury.

**Comment:** To date we are not aware of any incidents where people have hit their heads on the underside of the stairs. Libraries needed the space for trolley storage .This is a managment issue.

Signage – Wayfinding was noted to be difficult for a majority of the co-researchers and it is recommended that this is addressed. Please refer to the attached guidelines on signage and spatial orientation. It is recommended that the library consider a map at the front entrance and printing a brochure map of the library for patrons which can indicate where library items and amenities are located throughout the library. Consider consultation with users in the development of new signage.

**Comment:** We have not been happy with the signage carried out by others.Good idea.

Toilets – It is recommended that the toilet doors and flush mechanisms be reviewed to see if there are ways that they could be altered to require less physical effort to operate. It is recommended that consideration is given to a chair for toddlers in the family room. It is recommended that parents with toddlers are consulted with respect to this.

**Comment:** The toilets are compliant with the regulations and are designed to be vandal resistant. They are not domestic in their design or operation. A chair for toddlers is a sensible consideration.

Obtaining a product or service – It is recommended that the lowered check out desk is cleared of all pamphlets to enable library patrons, including children and wheelchair users, to use this lowered check out desk. It is recommended that investigations are completed with respect to NVDA (NonVisual Desktop Access) software, which enables users with low vision to operate computers: <http://www.nvda-project.org/>.

#### **Medium term**

Shelving – Shelving was noted to be difficult to reach for some of the co-researchers. Please refer to the attached guideline on comfortable reach.

**Comment:** See above.

Security gates – The security gates were noted to narrow the otherwise large entrance and were reported to feel imposing by their height and design. It is recommended that investigations are completed to widen the security gates and consider sourcing gates that are perceived to be less intimidating. Consider consultation with users in the choosing of alternative gates.

**Comment:** The gates purchase price was about \$30k. There are better designed gates available but these are even more expensive. The gates are there to stop books being stolen. They need to be certain height width and spaced to allow the sensors to operate properly.

Children's area – Several co-researchers have noted that it does not appear to be intuitive to have the children's area located upstairs. This requires parents with prams to be heavy users of the sole lift, and requires the not intuitive and difficult to use child gate at the top of the stairs. In addition, the balcony could pose a safety hazard for some children. In the medium term, it is recommended that the library consider re-locating the children's area downstairs. Consider consultation with children and their parents.

**Comment:** Agree and was always our intention - see above.

#### **Long term**

It was also noted that some structural elements, including the toilets and lifts, were unfortunately not designed large enough to accommodate some library users. When the library is undergoing substantial renovation or change in use, it is recommended that these

structural features are reviewed to be made larger and more universally designed.  
Collaboration with users is essential.

**Comment: Unlikely to happen.**

The person to contact regarding further enquiries regarding this feedback is:

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Note: The Universal Design Principles (word document) was provided as an Appendix.

## Appendix AE – Universal Design Assessment with Modifications as Suggested by the Co-researchers

### 1. Entrances/exits

Would you please inspect the use of entrances/exits of the building by: (Please circle)

<b>1. Using the entrances/exits is there equitable use?</b>				
Strongly Agree Agree Disagree Strongly Disagree				Comments:
<b>2. Using the entrances/exits is there flexibility in use?</b>				
Strongly Agree Agree Disagree Strongly Disagree				Comments:
<b>3. Using the entrances/exits is there simple and intuitive use?</b>				
Strongly Agree Agree Disagree Strongly Disagree				Comments:
<b>4. Analyzing the appropriate use of the tactile, aural, visual design features, such as materials, lighting and furniture within the entrances/exits is there perceptible information?</b>				
Strongly Agree Agree Disagree Strongly Disagree				Comments:
<b>5. Using the entrances/exits is there tolerance for error?</b>				
Strongly Agree Agree Disagree Strongly Disagree				Comments:
<b>6. Approaching the entrances/exits from both inside and outside is low physical effort required?</b>				
Strongly Agree Agree Disagree Strongly Disagree				Comments:
<b>7. Using the entrances/exits is there size and space for approach and use?</b>				
Strongly Agree Agree Disagree Strongly Disagree				Comments:

Adapted from Afacan & Erbug, 2009

## 2. Public amenities

Would you please inspect the use of public amenities – restrooms, information displays and seating units of the building by: (Please circle)

1. Using the restrooms, information displays, and seating units is there <b>equitable use?</b>					Comments:
Strongly Agree Agree Disagree Strongly Disagree					
2. Using the restrooms, information displays, and seating units is there <b>flexibility in use?</b>					Comments:
Strongly Agree Agree Disagree Strongly Disagree					
3. Using the restrooms, information displays, and seating units is there <b>simple and intuitive use?</b>					Comments:
Strongly Agree Agree Disagree Strongly Disagree					
4. Analyzing the appropriate use of the tactile, aural, visual design features, such as materials, lighting and furniture within the restrooms, information displays, and seating units is there <b>perceptible information?</b>					Comments:
Strongly Agree Agree Disagree Strongly Disagree					
5. Using the restrooms, information displays, and seating units is there <b>tolerance for error?</b>					Comments:
Strongly Agree Agree Disagree Strongly Disagree					
6. Using the restrooms, information displays, and seating units is <b>low physical effort required?</b>					Comments:
Strongly Agree Agree Disagree Strongly Disagree					
7. Using all the restrooms, information displays, and seating units is there <b>size and space for approach and use?</b>					Comments:
Strongly Agree Agree Disagree Strongly Disagree					

Adapted from Afacan & Erbug, 2009

### 3. Circulation systems

Would you please inspect the circulation systems of the building by: (Please circle)

1. Using the stairs/lifts is there <b>equitable use?</b>					Comments:
Strongly Agree Agree Disagree Strongly Disagree					
2. Using the stairs/lifts is there <b>flexibility in use?</b>					Comments:
Strongly Agree Agree Disagree Strongly Disagree					
3. Using the stairs/lifts is there <b>simple and intuitive use?</b>					Comments:
Strongly Agree Agree Disagree Strongly Disagree					
4. Analyzing the appropriate use of the tactile, aural, visual design features, such as materials, lighting and furniture within the stairs/lifts is there <b>perceptible information?</b>					Comments:
Strongly Agree Agree Disagree Strongly Disagree					
5. Using the stairs/lifts is there <b>tolerance for error?</b>					Comments:
Strongly Agree Agree Disagree Strongly Disagree					
6. Approaching the stairs/lifts from the corridors is <b>low physical effort required?</b>					Comments:
Strongly Agree Agree Disagree Strongly Disagree					
7. Using the stairs/lifts is there <b>size and space for approach and use?</b>					Comments:
Strongly Agree Agree Disagree Strongly Disagree					

Adapted from Afacan & Erbug, 2009

#### 4. Wayfinding

Would you please inspect the use of wayfinding systems of the building by: (Please circle)

1. Finding your destination through using all pictorial, verbal and tactile wayfinding elements, signage systems, maps, graphic information and marking systems is there <b>equitable use?</b>				Comments:
Strongly Agree Agree Disagree Strongly Disagree				
2. Finding your destination through using all pictorial, verbal and tactile wayfinding elements, signage systems, maps, graphic information and marking systems is there <b>flexibility in use?</b>				Comments:
Strongly Agree Agree Disagree Strongly Disagree				
3. Finding your destination through using all pictorial, verbal and tactile wayfinding elements, signage systems, maps, graphic information and marking systems is there <b>simple and intuitive use?</b>				Comments:
Strongly Agree Agree Disagree Strongly Disagree				
4. Analyzing the appropriate use of the tactile, aural, visual design features, such as materials, lighting and furniture within the entrances/exits is there <b>perceptible information?</b>				Comments:
Strongly Agree Agree Disagree Strongly Disagree				
5. Analyzing the appropriate use of the tactile, aural, visual design features, such as materials, lighting and furniture within all the entrances/exits is there <b>tolerance for error?</b>				Comments:
Strongly Agree Agree Disagree Strongly Disagree				
6. Using all wayfinding elements, signage systems, maps, graphic information and marking systems is <b>low physical effort required?</b>				Comments:
Strongly Agree Agree Disagree Strongly Disagree				
7. Using all the wayfinding elements, signage systems, maps, graphic information and marking systems is there <b>size and space for approach and use?</b>				Comments:
Strongly Agree Agree Disagree Strongly Disagree				

Adapted from Afacan & Erbug, 2009

**5. Obtaining products/services**

Would you please inspect the use of obtaining products/services of the building by: (Please circle)

1. Obtaining a product/service in the building is there **equitable use?**

Strongly Agree Agree Disagree Strongly Disagree

Comments:

2. Obtaining a product/service in the building is there **flexibility in use?**

Strongly Agree Agree Disagree Strongly Disagree

Comments:

3. Obtaining a product/service in the building is there **simple and intuitive use?**

Strongly Agree Agree Disagree Strongly Disagree

Comments:

4. Analyzing the appropriate use of the tactile, aural, visual design features, such as materials, lighting and furniture when obtaining a product/service is there **perceptible information?**

Strongly Agree Agree Disagree Strongly Disagree

Comments:

5. Obtaining a product/service in the building is there **tolerance for error?**

Strongly Agree Agree Disagree Strongly Disagree

Comments:

6. Obtaining a product/service in the building is there **low physical effort?**

Strongly Agree Agree Disagree Strongly Disagree

Comments:

7. Obtaining a product/service in the building is there **size and space for approach and use?**

Strongly Agree Agree Disagree Strongly Disagree

Comments:

Adapted from Afacan and Erbug (2009)