

**INTERNATIONAL TRENDS IN ACCESSIBLE HOUSING
FOR PEOPLE WITH DISABILITIES**

**A selected review of policies and programmes in
Europe, North America, United Kingdom, Japan and
Australia**

Working Paper 2

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1. INTRODUCTION

The Centre for Housing Research Aotearoa New Zealand (CHRANZ) has commissioned the Centre for Research, Evaluation and Social Assessment (CRESA) and the Auckland Disability Resource Centre to undertake research into accessible housing for the future ageing and disabled population in New Zealand. The aim of the research is to assist the housing and disability sectors to effectively optimise housing access for the growing numbers of people who will be managing severe or moderate disability over the next twenty-five years. The research focuses on the capacity of the housing market to respond to the rising demand for 'lifetime homes' and the opportunities to establish a housing stock that is future-proofed for those affected by challenges to their mobility and agility through moderate to severe physical disability and ageing.

The research has four main components:

- Forecasting the likely prevalence and incidence of moderate and severe physical disability of people living in New Zealand dwellings up to 2026.
- Identifying trends in international best practice around accessible housing.
- Establishing the housing experiences of individuals with moderate to severe mobility disability and their families.
- Determining the likelihood of, and opportunities for, disability-proofing NZ's housing stock.

This particular paper addresses the second of those components and is designed to improve our understanding of international practices in relation to promoting and investing in a housing stock that responds to the needs of disabled people. The paper summarises the results of a review of literature able to be accessed by way of the internet and is intended to provide an overview rather than a detailed or comprehensive study. The discussion is structured as follows:

- Section 2 provides a brief contextualisation of housing and disability and the different approaches to housing for disabled people apparent in the international arena.
- Section 3, Section 4, and Section 5 comment on the three major international trends in disability and housing. Those are respectively:
 - Increasing the accessibility of the mainstream housing stock.
 - Improving the cost-effectiveness and functionality of house modifications for disabled people.
 - Better integrating assistive technologies into domestic environments.
- Section 6 comments on the likely future of accessible housing.

2. HOUSING & DISABILITY: RISING INTERNATIONAL INTEREST

There is little doubt that there is rising international interest in the interface between housing and disability. That interest has been driven by three distinct trends. Firstly, a major demographic transition is occurring in which the populations of most industrialised societies are ageing. Secondly, there appears to be increasing disability prevalence, partly driven by ageing and partly driven by improved survival rates among those affected by disabling injuries, conditions, or illnesses. Finally, the disability sector has been increasingly concerned to position disabled people within the international human rights agenda and reinforce their rights to be included in and productively participate within the communities in which they live.

The difficulties in forecasting disability prevalence are discussed in Saville-Smith and James (2006). Some of those problems arise from different approaches to both the concept of accessibility and the concept of disability. Both concepts are contested. Nevertheless, it is generally accepted that older people are more vulnerable to reduced physical functionality and that the prevalence of disability is increasing. Within that context, two approaches to addressing disability have emerged: a rights based approach, and an individualised needs based approach.

In the human rights based, social approach disabled people are characterised as disabled by the barriers they encounter in the physical and social environment in which they live, rather than by an individual's particular functional impairment. Social models tend to prompt policies and legislation that seek to create universal design environments, suitable for all ages and abilities. Issues are seen not as primarily individual, but concerned more with the disabling effects of inaccessible environments. As a result, there is a focus on creating accessible mainstream housing, transport, public amenities and services.¹ In the individualised, needs-based approach, the disabled individual person is considered to be disabled by the particular functional impairment they have. The response is directed to modifying the immediate environment used by that individual or providing assistive technologies to optimise their functionality within that environment.

These approaches are not, of course, mutually exclusive. Indeed, one of the most apparent recent trends has been an increasing focus on the interaction between the built environment and the needs and rights of access and participation of disabled individuals. The adoption of a human rights based approach to disability has demonstrated that addressing disability requires a focus beyond the disabled individual to the accessibility and liveability of homes, settlements and communities (Zola, 2005; Darcy, 1999; Kochera, Straight and Guterbock, 2005; Myer Foundation, nd; Royal Australian Institute of Architects, 2004; Zola, 2005). For disability advocates, accessibility extends well beyond any physical features built into a home and is very closely linked to barrier-free access to the surrounding natural, built and social environment, services and facilities (Quinn, 2005; Bridge, 2005; World Health Organisation, 1997; Darcy, 1999; Zola, 2005; Biocca and Dewsbury, 2004; Commission of the European Communities, 1996). At the same time, the ability of disabled people to maximise their independence in their own homes is also critical. The adequacy of their home for a disabled person is increasingly recognised, as it is already for other people, as a crucial platform for well-being and productivity (Derby City Council Social Care and Health Commission, 2002; Commission of the European Communities, 2000).

The growing integration between social and individualised approaches to disability is reflected in three major trends in relation to housing:

- The development of various accessible housing standards and typologies for the design and construction of the mainstream housing stock, which are directed to making mainstream houses and buildings more accessible for disabled people.
- Concern with more effective and less costly adaptation of dwellings in which disabled people live.
- A concern to better integrate assistive technologies into home environments.

¹ The World Health Organisation (1997) adopts a social model of disability. It considers that disability is created when a person "*interacts with an environment that does not support his or her performance in a desired activity*". A person is therefore rendered disabled by the inaccessibility of their built environment and by negative attitudes and stigma, rather than their physical or other impairment (Joseph Rowntree Foundation: 1995; WHO: 1997).

3. MAKING MAINSTREAM HOUSING ACCESSIBLE

It has increasingly been recognised internationally that if disabled people are to participate in social, economic and familial life they must be able to access the sites in and around which those interactions occur, whether those be domestic or other buildings, transport, or public spaces.

Access to buildings and spaces can be set at different levels of functionality for disabled people. Milner and Madigan (2004) identify a continuum of accessibility for domestic buildings that moves from:

- **Negotiable** where a building allows only for assisted access and provides some movement around the lower levels, but does not necessarily provide access to a toilet.
- **Visitability** where a building allows independent wheelchair entry to the property, access to lower levels, ability to move between rooms and access to the toilet.
- **Liveable** where there is unassisted wheelchair access to the lowest level of a building and the ability to move between rooms, access to a usable bathroom, toilet and a bedroom.
- **Adaptable** where the whole house or flat is retrofitted or purpose built to give the desired level of accessibility that will be required through the occupant's social and life cycle changes over at least a 30 year period.
- **Universal** where a whole house or flat is fully accessible to an unassisted wheelchair user or person with other functional impairments.

A variety of labels have been used to refer to designs that have attempted to capture the concept of high standards of accessibility in the context of increased disability prevalence and ageing societies. Some of those have effectively become forms of product branding; others simply convey a design vision. They range from: Universal Design to Barrier Free Design. Infobox 1 provides a brief summary of the rationale and focus of the key approaches to accessible housing.

Infobox 1: Key Approaches to Accessible Mainstream Housing Design

<i>Universal design</i>	An approach to the design, construction and adaptation of standard housing to meet the needs of all home owners regardless of their age, ability, or social situation. Universal design benefits all age groups. Also known as <i>Universal Housing</i> and <i>Adaptable Housing</i> . Achieving uptake in the social housing market; but its adoption in private dwellings has been limited.
<i>Life Span Housing</i>	Housing that can accommodate changes in human ability over a person's lifespan, enabling the occupants to live and remain in their homes as long as possible. Also known as <i>Lifetime Homes</i> in the United Kingdom, <i>Lifecycle Housing</i> in Norway and <i>Adaptable Housing</i> in Australia.
<i>Inclusive Design</i>	A way of designing products and environments so they are usable by everyone regardless of age, ability or circumstance. Remove barriers in the social, technical, political and economic processes underpinning building and design.
<i>Barrier-free Design</i>	To be active, a disabled person should be able to commute between home, work and other destinations. Barrier-free design ensures that the whole built and transport environment meets the needs of people with physical, sensory or cognitive disabilities.

The extent to which mainstream housing stocks overseas are influenced by the movement for more accessible design is difficult to estimate. What is clear, however, is that there are three potential pathways through which the take-up of accessible design may be promoted. They are:

- regulation,
- incentivisation, and
- market capacity development.

3.1 Regulation for Accessible Housing

Regulation for accessibility is most commonly applied to public buildings, social housing and new multi-unit dwellings. Existing dwellings and dwellings in private ownership tend to be least subject to regulatory requirements. Northern European countries and the United States have the longest history of requiring accessibility features. Japan and the United Kingdom have more recently adopted visitable standard access regulations for all new housing. Infobox 2 on the following page provides an overview of the regulatory requirements for providing disabled accessibility to buildings for seven countries and the European Union.

International practice is marked by diversity. The regulatory frameworks implemented in different countries vary from those directed at simply achieving a low level of accessibility for public buildings through to a comprehensive requirement for new dwellings to be built to universal design. One of the most advanced examples of regulatory requirement on accessibility is found in the Accessibility for Ontarians Act (2005). That Act aims to create a barrier free Ontario by 2025 and applies to both transport and buildings. All sectors are affected by the requirements of the Act – provincial government, public sector and private sector (Ontario March of Dimes, 2005). Notably, the Ontarian Act only has implications for the province of Ontario. The Canadian Government tends towards incentive based rather than regulatory oriented strategies.

The importance of local, state or provincial Government in setting regulatory requirements is also evident in the United Kingdom. It is in London, through the *London Plan Policy 3A.4: Housing Choice*, that significant regulatory requirements are being placed on the housing sector. That Plan will require all London Boroughs to include policies in their development plan documents to ensure that all new housing in London is built to universal design Lifetime Homes standards (Greater London Authority, 2004; Ramrayka, 2006). That development extends beyond the national requirements, although the United Kingdom has also made a significant recent change in its regulatory framework with the introduction of a visitable standard of access for all new housing (United Kingdom Building Regulations Amendment M). Previously those requirements only applied to social housing. The Building Code also supports the development of more Life Time Homes.

The United Kingdom tends to be more prescriptive and goes beyond the requirements of the European Union on its member states. Building standards vary greatly between European Union Member states but in general, accessibility to buildings is secured by three main strategies; mainstreaming, exclusive legislation and a progressive approach. Mainstreaming is where all new dwellings must meet access standards for disabled people, as in Denmark, Sweden, Norway, and the Netherlands. Exclusive legislation is applied only to certain categories of users, such as special standards for housing intended for wheelchair users as found in Austria, Germany, Portugal, Luxembourg, and the United Kingdom. A progressive approach where increasing degrees of accessibility and adaptability are stipulated for different building types or disabled users can be found in some countries such as Italy (Nielsen and Ambrose, 1998).

Infobox 2: Regulatory Requirements for Disability Access

Country	Framework/legislation	Year	Public Buildings	New Homes	Existing Homes
Australia	Building Code of Australia. Standards for public buildings.		√		
	State level Building Standards for accessible showers, doorways, ramps.	2005	√	√	
	AS/NZS 1428.4:2002. Design for access and mobility. Tactile Indicators.		√	√	√
	AS 4299-1995. Adaptable Housing Standard.	1995	√		
	AS 14281-200. Design for Access and Mobility		√		
United Kingdom	NHS and Community Care Act	1990	√	√	√
	United Kingdom Building Code. Lifetime Home Standard Part M. Similar codes in Scotland & Wales	1999		√	
	BS8300:2001. Code of Practice.	2001	√		
	BS 5588. Part 8. Safe means of escape for disabled people (fire related.)	1999	√	√	√
	Local Govt & Housing Act	1989	√		
	Disability Discrimination Act	1995	√	√	√
Canada	Accessibility for Ontarians with Disabilities Act	2005	√	√	√
United States	Federal Fair Housing Amendments Act	1968	√	√	√
	Americans with Disabilities Act	1990	√	√	√
	Visitability laws - some states		√	√	
	Architectural Barriers Act Public law 90-480. Uniform Federal Accessibility Standard.		√		
	HB 1441. (Visit ability access)		√	√	
	Pending: Inclusive Home Design Act.		√	√	
Japan	General Principles Concerning Measures For The Aged	2001	√	√	
	Housing Quality System (1999)	1999		√	
	Accessible and Useable Building Law (revised)	2003		√	
European Union	Standard EN 81-70. Independent access and use of lifts	2003	√	√	
	Commission of the European Communities Directive 2000/78	2003	√		
Norway	Life Span Dwellings Standard	1995	√	√	
Israel	Accessibility Chapter of the Equal Rights for People with Disabilities Law.	2005	√	√	

Japan has also adopted a strong framework of regulatory requirements and has mandatory provisions for access in relation to transport and public buildings. The design *Guidelines for Dwellings for an Ageing Society* (1995) aim to have 20 percent of all new dwellings built to universal design and a further 20 percent built to barrier free standard. The “Gold Plan” of 1994 set a target of 100,000 care housing units, but it is reported fewer than 7,000 were actually built. An amended “Gold Plan” emphasises ageing in place and requires all new housing be able to accommodate the occupant’s life changes over a period of 30 years, and a universal design standard. The new target is 40 percent of all housing stock to support ageing in place, through either new builds or renovations (Herd, Ward, and Seegar, 2003; Kose, 2004; Kawauchi, 1995).

The regulatory environment in Australia is patchy. Each State and Territory has undertaken some regulatory action to increase the supply of accessible housing, but standards and the degree of compulsion differ markedly. Moreover, at local government level within States, many councils have implemented their own building regulations which exceed Federal and State requirements. The diversity in Australia is clear:

- Since 2002, the ACT has had provisions that 10 percent of all new, multi-unit developments must be adaptable.
- Victoria’s ResCode relates to accessible multi-unit developments.
- South Australia has a requirement for one accessible unit in any 20+ unit development.
- Adaptable housing features have been incorporated into new Tasmanian public housing since 2001.
- In New South Wales local councils require developers to include a proportion of accessible and adaptable homes to be built within any housing development over a certain number of units.
- The City of Melbourne has visitable and accessible building requirements (Royal Australian Institute of Architects, 2004).
- Willoughby Council (Sydney) requires one in nine units to be accessible in any 9+ multi-unit development.

Overall, the emphasis in Australia is to increase inter and intra State consistency. The Australian Building Codes Board, along with disability advocates, design professionals, Government and the property industry have been preparing a new access standard for buildings to meet the level of access required by the Federal Disability Discrimination Act (DDA). Developers and designers creating buildings that comply with the Australian Building Code will also comply with the Disability Standard and be protected from DDA complaints (Innes, 2006).

Despite the United States having the longest standing accessibility legislation (since 1968), housing services are still fragmented and dominated by private insurance systems, partial federal funding and tensions between federal and state relations in funding (Leibig, 1993; Lawler, 2001). There is a stronger reliance on private sector services in the United States than in most other countries, particularly to house the disabled elderly. Regulation in some states relating to public information about accessible housing stock for sale or rent available through public registers has been beneficial (Cheek, 2004).

Overall, a number of points emerge from a review of regulatory requirements around building access for disabled people:

- It has been noted in a variety of research reports that accessible building standards, even where these are compulsory, tend to be poorly enforced (Commission of the European Communities, 2001; Lawler, 2001; Zola, 2005; Beresford and Oldman, 1998; Beresford and Oldman, 2000; Disability Rights Task Force on Civil Rights for Disabled People, 1999).
- Most accessibility requirements relate to those who have a physical rather than a sensory impairment to their mobility.

- On the continuum of accessibility, most standards require relatively low levels of accessibility falling into the 'negotiable' or 'visitable' categories.

Most important in this context is the limited focus on domestic dwellings. Most standards relate to public buildings. Where there are explicit and required standards for domestic dwellings, those tend to be restricted to new dwellings.

3.2 Incentives for Accessible Housing

The use of incentives by governments to increase the supply of accessible housing is less common than regulation. Incentives tend to be in the form of:

- access to low cost loans for new housing;
- grants for modification work to existing housing; and
- planning consent advantage for housing developers who include a percentage of accessible housing in new developments.

Japan is particularly prominent in supporting a strong regulatory framework with a platform of incentives. For instance, Japan has regulatory requirements in relation to multi-unit dwellings. For other dwellings, it heavily incentivises designs that promote access to a visitable level of access. The Japanese Housing Loan Corporation (JHLC) provides subsidised home loan interest rates and bigger mortgages for universal design and barrier-free dwellings. This has had the effect of greatly encouraging private sector building companies to change their designs to include accessibility features. As a result, sixty percent of all new applications to the JHLC in 2003 complied with design for ageing standards (Kose, 2004; Kose *et al.*, 2004).

Norway also relies heavily on financial incentives to encourage the private sector to build to accessible design and the Government has a significant accessible design housing action programme. The universal design home is branded as Lifecycle Housing. The Norwegian Housing Bank offers a programme of low cost, entry level 'basic' loans, designed to increase the number of dwellings built to the standard. The incentives include enhanced loans from the Bank, which overall finances 50 percent of all new Norwegian housing. From 1996 to 2005, a one percent lower interest rate was offered. Greater market acceptance of Lifecycle Housing has been achieved by linking accessibility with quality design and encouraging partnerships between architects, disability groups and builders.

An Australian example of incentivisation through preferential planning processes is Kogarth Council in New South Wales, which exempts developers from certain conditions if they build 50 percent adaptable housing in any new development in approved zones. The Kogarth process is based on a model sustainable housing code developed by the South East Queensland Region of Councils. Western Australia's design code encourages small scale, specialised, disability housing development and in Queensland, the State Government has brought together a Smart Housing Partnership Agreement between seven Government agencies.

In Canada lower cost home loans are available to builders of accessible design housing through the Canadian Mortgage and Housing Corporation.

A number of points emerge from a review of incentives around building access for disabled people:

- Private sector housing developer engagement relies on substantive financial or planning benefits being available.

- Difficulties in achieving good quality aesthetic design as well as functionality are widely reported as an issue.
- Despite incentives in some jurisdictions, there is still generally weak market take-up of universal design housing, by both commercial and individual builders and by home purchasers.

3.3 Capacity Development for Accessible Housing

The third way in which countries attempt to increase the accessibility of the mainstream housing stock is to support the capacity and willingness of the construction industry and the housing sector to provide well designed stock. A myriad of tools and mechanisms are used from voluntary design guidelines, to information brokering and promotion of accessible design principles amongst the design, planning and building industries. Indeed, good practice resources, voluntary design guidelines, supportive strategic discussion documents and information resources promoting accessible housing were found in all jurisdictions reviewed. Some countries also offer national awards to designers and architects, or community service awards for accessible housing projects, as in Australia and the United Kingdom. Information and voluntary guidelines were the most commonly found government activities that focus on the private sector architecture and building industries.

It is notable that while regulatory requirements and incentives tend to involve local, regional or central Government as the core agency in developing and implementing those systems, capacity development tends to be led by a variety of different agencies and organisations, many of which are industry or disability sector based. For instance, design guidelines are produced by a wide range of agencies including governments, disability advocacy groups, professional interest groups (such as architects and designers), non-profit service providers and local councils.

The Office for an Ageing Australia provides one example of the facilitative and collaborative characteristics of capacity development approaches. It is actively involved in facilitating debate between designers, architects, builders and other key stakeholders, around increasing the supply of accessible housing. In 2005 they organised a National Speakers Tour to stimulate debate and seek input from ordinary Australians about the future shape of the built environment. At a local government level, the Australian Local Government Association has a similar role. Both agencies also promote good practice and showcase successful housing developments.

Another area in which collaborations between the private, public and community sectors is becoming evident is in the development of 'branding' of housing systems. The branding of universal design homes by governments for marketing purposes is becoming more common. Examples include Flex Homes in Canada, Life Time Homes in the United Kingdom and Smart Homes in the United Kingdom and European Union. Branding is designed to stimulate the supply of accessible homes through raising consumer demand. Branding aims to create a higher perceived value for accessible housing to counter consumer resistance on the grounds of increased cost, poorer design aesthetics and reduced ability to on-sell properties because of the attached social stigma.

Flex Homes, developed by Canada Mortgage and Housing Corporation (CMHC), was introduced as a step towards generalising the uptake and marketing of universal design housing in Canada. It is a national programme offering suspended loans for renovations of existing housing that incorporate Flex Housing principles, and for new multi-unit housing developments. Flex Housing emphasises accessibility and is engineered to adapt, at minimal cost, to the changing needs of the home's occupants over their lifetime. It incorporates the principles of adaptability, accessibility, affordability and healthy housing,

and was developed specifically with the idea of being able to be on-sold in the private housing market, as a quality improvement to traditional housing design. The homes are universal design to meet the needs of a variety of users. The design addresses impairments related to mobility, agility and dexterity (e.g. lever-type handles, conveniently placed electrical outlets, lower shelves and light switches), balance (e.g. non-slip floors, grab rails, consistent stair depth and tread height) and stamina, making it easier for people to carry out ordinary living tasks (e.g. lowered kitchen counters to allow sitting, short distances between kitchen and eating areas, easy-to-open doors and easy-to-use appliances). One example of a community-led, housing development project where Flex Housing has been used is the Seabird Island First Nation Sustainable Community Demonstration Project in British Columbia. Key elements include an accessible environment around the housing development, as well as universal design housing. The project is a partnership between the Seabird Island community, CMHC, the building industry and community groups (Doble and Sieniuc, 2003).

The United Kingdom Government promotes Life Time Homes and has developed building standards relating to this, although the design features are not compulsory. Life Time homes incorporate design features for accessible and adaptable housing in any setting to increase choice, independence and longevity of tenure. The design allows for flexible living arrangements over the lifetime of the occupants and the dwelling. In addition to the normal ground and first floors, most houses have a full basement, accessible, useable roof voids, and concrete intermittent floors. These features allow basements and roof voids to be furnished or left to be fitted out when needed as extra living space as families grow or age. Concrete intermittent floors permit non-load bearing walls to be moved for room size flexibility and providing sound barriers. The Life Time Homes Standards relate only to the structural design and construction. For people with mobility impairments, lifts can be installed with minimal disturbance and cost.

The development of quality assurance systems is a key part of capacity development. Collaborations between the private, public and community sectors are also characteristic of these initiatives.

An example of a quality assurance system is found in Japan. In 1999 Japan introduced the Housing Quality Indication System to improve the standard of multi family housing. This also has a focus on universal design features. It is reported that around 3,500 new detached houses and 10,000 new multi-family units obtain the housing quality certificate every month (Kose, *et al.*, 2004). This means that while the majority of new dwellings are not universal design, a considerable number are. A certification system for existing dwellings was also introduced in December 2002, but very few dwelling owners applied (127 detached houses and 89 multi-family dwellings until March 2004). Kose (2004) argues this is partly because of cost versus benefit, and partly because there is potential risk of poorer quality construction or design.

In the United Kingdom the Bolton Metropolitan Borough Council operates a Housing Quality Assurance system designed to report on the quality of housing services, through monitoring its Bolton At Home agency and eight partner Registered Social Landlords (RSL's). However on closer inspection, the Disability Grants scheme (for home modifications) administered by Bolton at Home, stipulates a timeframe of: ten days for an information pack to be supplied; eighteen months for a standard priority assessment visit; six months for notice of approval of a grant. This represents up to two years to get the disability grant, and before a housing modification can be made, although there is an urgency provision (Bolton Metropolitan Borough Council, 2006).

4. MODIFIED HOUSING FOR DISABLED PEOPLE

While making mainstream housing more accessible is increasingly seen as desirable, most disabled people are confronted with living in a dwelling that has not been designed on the principles of universal design. For moderately and severely disabled people, further modification and customisation of their domestic environment has been the major response to supporting their independence. It is increasingly being accepted internationally that a failure to adequately modify domestic environments for disabled people's immediate and changing needs is likely to be associated with rising care costs, deteriorating health and wellbeing, dislocated family relations and recourse to higher dependency housing.

All the reviewed countries have housing modification programmes of some type in place. Those, however, vary a great deal in scope, delivery mechanisms and ease of access. Modification programmes focus on meeting individual needs and provide either grants or low cost loans for building and other work to be carried out. The most common access modifications to existing housing are mobility related – the installation of ramps, widened doorways, grab rails and push bars, modified taps and other plumbing fittings, adapted telephones and various types of alarm. Two common delivery mechanisms are through statutory health agencies as medical benefits, or through some form of devolved agency such as a local Council or non-profit organisation, as a grant scheme.

4.1 Funding and Providing Effective Modification

Modification programmes appear to typically confront a number of difficulties in relation to (Joseph Rowntree Foundation, 1995 and 2005; Beresford and Oldman, 1998; Beresford and Oldman, 2000; Bridge, 2005; Lawler, 2001; Leibig, 1993; Mountain and Buri, 2005):

- administration and assessment of need;
- adequately expressed qualifying criteria;
- the adequacy of the financial assistance offered;
- matching of disability with the correct housing modification;
- delays in carrying out building work; and
- the adequacy of resources relative to the level of need.

Nevertheless, housing modification programmes are the most common way in which countries seek to meet the housing needs of disabled people.

In Australia, a range of state and federal government administered schemes provide limited assistance for home modifications, and aids and appliances to enable older people with a degree of disability to live in their own homes. Just over 19 percent of Australians have some form of disability (Ward, 2005). In addition, many older Australians want to continue living in their own homes as they age, but by and large Australian houses are not designed to meet the needs of people with moderate to severe disabilities (Herd *et al.*, 2003). The former Department of Health and Aged Care (HACC) Home Maintenance Service (now Department of Health and Ageing) is the major initiative for home adaptations. HACC is a cost shared programme between the Commonwealth and State/Territory governments for services which support frail aged and younger disabled people to stay living at home. An estimated 374,736 people received home modification assistance for the period 1999-2000.

The Canadian Mortgage and Housing Corporation (CMHC) provides a range of funding programmes to modify existing homes in order to be more accessible. The three main programmes are:

- Residential Rehabilitation Assistance Program for Persons with Disabilities (RRAP) offers financial assistance to homeowners and landlords to modify main dwellings for occupancy by low-income people with disabilities.
- RRAP for secondary and garden suites assists low-income seniors and adults with a disability to convert or develop existing residential properties to accommodate a secondary self-contained unit.
- Home Adaptations for Seniors' Independence (HASI) programme provides assistance to help low-income senior homeowners and low-income tenants and their landlords pay for home renovations.

In the United Kingdom, community-based Home Improvement Agencies provide information, support and funding for essential home modifications and local authorities administer a £345 million Disabled Facilities Grant scheme. There have been initiatives to better co-ordinate supplies of assistive equipment in 2001 and 2004. A Disabled Facilities Grant was also established to pay for housing adaptations for people who are not Council tenants. More recently, a national home repair and modification programme has been introduced.

The national programme to assist older disabled people with housing is co-ordinated through Care & Repair England. Its aim is to stimulate the development of local "housing options" services for older people and is targeted at people finding their current housing hard to manage and facing the possibility of moving home. The target is low income older and disabled people living in private rented or owner occupier housing. Home Improvement Agencies offer home modifications, security, handyman services for minor repairs, advocacy, befriending, managing tradesmen, energy conservation, welfare benefits and grants, volunteer gardening services, fall prevention, daily living support, respite and home safety checks.

In the United States there is no comprehensive national programme to modify existing homes and few specialised or local programmes, although as elsewhere, the non-profit sector is involved as smaller scale providers and as advocates. The main sources of housing assistance are the Department of Housing and Urban Development (HUD), Health and Human Services (HHS), Medicaid and Internal Revenue Service. Assistance is provided through a mix of tax credits, mortgage interest deductions, housing subsidies, vouchers and grants, and insurance based medical benefit entitlements. The boundaries, entitlement criteria and targeting are inconsistent and conflicting. There are considerable barriers and limitations on uptake (Lawler, 2001). Overall, housing assistance is distributed as a limited subsidy with an annual cap on the number of units provided, rather than to the number of people who are eligible.

The efforts by governments and non-profit agencies to adapt existing dwellings in the United States are reported as piecemeal. Services are often not based upon need, but on the type of service for which someone qualifies. For example, people who are eligible for Veteran's Administration service can receive up to \$35,000 in renovations, while an individual with similar needs on Medicaid might have no housing modifications covered (Lawler, 2001; Louie, 1999). Farmers Home Administration provides low interest loans and grants to rural homeowners 65 years and over, some states provide low-interest deferred loans for modifications and some municipalities have used Community Development Block Grants for this purpose. Nevertheless, most disabled people are not covered by these programmes. Health care reimbursements in the United States are limited and do not usually cover home adaptations. However Medicaid waiver provisions in some states that provide for a varying amount of housing adaptations. Private insurance companies usually do not pay for home modifications. The United States Internal Revenue does allow individuals to deduct the costs of home modifications from their income tax, as part of their medical expenses (Leibig, 2004; Lawler, 2001; Louie, 1999).

4.2. Increasing Access to Modified Housing

Internationally, there is increasing interest in using accessible stock more efficiently. One of the issues consistently raised by disability advocates is that modified dwellings are 'lost' to the disabled market through on-selling to non-disabled consumers. Another issue is that buyers and renters seeking accessible housing often have limited knowledge or information about the available stock. The use of registers of accessible dwellings is one method of improving the efficient use of stock, expanding the information base about accessible housing and matching stock with consumers.

Registers operate by identifying accessible dwellings and making available information on those dwellings to disabled people, so that they are able to exercise more housing choice. The use of registers varies across the countries reviewed. There are a few comprehensive registries of accessible housing stock for either rental or sale properties. There are many examples of local, non-profit initiatives, and some state or nationwide registers, the latter most notably in the United States and Norway. The United States appears to have the most well established systems for registering accessible housing units, with registers found for 19 different states. The registers vary in the amount of detail they record and the focus of the information, which ranges from listing general housing, through to special needs and accessible and affordable housing. Eleven of the registers identified focus specifically on accessible and affordable housing (Citizens Housing and Planning Association, nd).

One example is the Massachusetts Accessible Housing Registry, known as Mass Access. The register is a free, web-based programme that helps people with disabilities find housing within the state of Massachusetts. Mass Access started in 1995, and initially people searching for an apartment needed to contact an Independent Living Centre (ILC) to learn about available apartments. This information is now available via a website for independent searches.

Under the Mass Access programme, landlords and management companies register all vacant (or soon to be vacant) affordable, accessible apartments. Registered landlords and management companies are required to rent accessible housing to a person with a disability or hold the apartment for 15 days (while searching for a renter with a disability). The Mass Access programme is run on a modest level of funding of approximately \$100,000 United States per annum (Gesson and Haynes, 2004).

Massachusetts State law requires that accessible housing owners allow information about their units to be made available to the public. This appears to have been a critical element driving the quality of this register. Other states seeking to set up registers have had difficulty securing voluntary permission from property owners. As a result, other United States registers are reported to be less comprehensive than Mass Access (Cheek, 2004).

The Minnesota register is called Housing Link. Like Mass Access, this was developed by non-profit advocates for affordable housing and is now supported by state funding. The Connecticut register is modeled on Mass Access, and again, was initiated by non-profit organisations and is supported by ongoing state government funding (Cheek, 2004). The Tennessee Housing Resource Locator has a residential service focus and was developed for people with persistent and severe mental illness.

In Norway, the Directorate of Public Construction and Property (Statsbygg) carries out registration of accessible and universal design housing in the public buildings within its portfolio. This system includes a process for identifying any repairs or maintenance which

needs to be undertaken and also tracks for completion of maintenance plans. There is a separate budget for universal design modifications that cannot be included in ongoing repair works. The registration system uses a modified version of an internet-based system called YOU-TOO, which was originally developed as a European system for public information on accessibility to public buildings. The information is collected in a way that allows matching based on a person's individual requirements. Individuals are able to search the register (Aslaken, 2004).

Numerous examples of much smaller, local registers were found. One example is the Glasgow Disabled Persons Housing Service (GDPHS). GDPHS has developed two databases; the first for disabled people to register a housing need and the second to hold a profile of available accessible housing stock in Glasgow. Between them, these two systems allow GDPHS to operate what they claim to be the first on-line disability housing register in Scotland (Centre for Independent Living in Glasgow, nd). The database provides a source of referrals for housing providers with vacant adapted or accessible housing, to help ensure the housing is allocated most effectively. In 2003/04 the system held the details of over 200 disabled people in housing need who were looking for suitable adapted or accessible accommodation. Another recent development is a Greater London Authority feasibility study proposing a web based London-wide Accessible Housing Register that would allow disabled people to view and bid online for any property on the market or available for rent (Greater London Authority, 2006).

5. BRINGING ASSISTIVE TECHNOLOGY INTO HOMES

Assistive technologies (AT) are well known to people with severe or moderate disability. They can be simple, such as commodes. They can be extremely complex, sophisticated and expensive pieces of equipment. Whether simple or complex, many require house modifications to work effectively for a disabled person. One of the new developments in housing, however, is not the specialised assistive technologies traditionally used by disabled people, but the integration of a variety of AT devices and systems into standard housing. While this has not yet taken place on any scale, in some areas such as alarms, monitors and detectors related to safety in the home, there seems to be considerable latent demand with a drive to branding AT in a way that appeals to computer familiar people and the anxieties of older people. Infobox 3 sets out some of those brands and technologies.

Infobox 3: Assistive Technologies, Packages, Devices and Systems

Smart Homes	Built-in devices and systems run by a central computer. Typically include remote control and sensor activated devices, time-of-day dependant heating and lighting, internal and external lighting, automatic doors, windows, home security alarm systems, and/or telemedicine systems.
Tele Medicine	Monitors for heart beat, breathing, blood pressure etc, linked to hospital assistance services. For people needing continuous check ups.
Tele Care Community Alarms	Typically focused on safety in the home with passive sensors or alarms connected to a call centre. Alarms are triggered automatically or manually when hazards are detected or accidents such as falls occur. Also includes time of day dependent devices, for example to control lighting, heating. Tele Care can also be as simple as regular telephone calls to check on a person's wellbeing.
Teleaid	Alarms, either user or automatically triggered.
Telechecking	Regular wellbeing checks by telephone.
Telemonitoring	Telephone monitoring and devices that provide remote monitoring of health status (e.g. heartbeat and breathing).

Although the use of AT in the homes of disabled people is not yet widespread, there are several trends that indicate uptake may potentially be far greater in the future. These trends are:

- The cost of devices and systems is reducing as the technology platforms they use become mainstream. The rapidly growing technology is diffusing down from high-end luxury applications, to lower income markets, as it becomes cheaper and more available.
- The next generation of disabled and older people are more open to using technology and have more familiarity, knowledge and information about its uses.
- Wireless technology and mobile phones are reducing installation and maintenance costs and have the potential to eventually do away with the need for costly fixed wiring installations.
- As more universal design housing comes into the market, the cost of fitting AT and necessary modifications will reduce. Universal design and barrier free design is far cheaper and easier to build AT into or install later. (Dewsbury *et al.*, 2001; Tinker *et al.*, 2004; Van Berlo, 1999; Dewsbury and Edge, 2000; Biocca and Dewsbury, 2004; Barlow *et al.*, 2006).

The benefits of AT in the homes of disabled people are that they reduce accidents in the home, help to overcome architectural disability (thereby reducing the need for home care services, hospital and rest home admissions), and allow people to maintain their independence and quality of life. AT increases the level of real and perceived safety by monitoring the individual and their environment for hazards, and alerts caregivers quickly when a person is in difficulty. However, there is considerable debate as to the quantum of benefits associated with these types of developments, the rapidity with which those benefits are felt, and the range of benefits (Bayer *et al.*, 2005; Tinker *et al.*, 2004; Dewsbury *et al.*, 2001; Edge *et al.*, 2000).

The use of AT in housing for the disabled is still in its infancy in the United Kingdom as elsewhere. In 2000 the Joseph Rowntree Foundation developed two demonstration Smart Homes and carried out a study of 1,000 households to gauge consumer interest in Smart Home technology. They report that AT does offer benefits to disabled and frail people reliant on home care, but that these benefits would only be realised if prices dropped and equipment became more widely available through a broader market for the technologies developing (Joseph Rowntree Foundation, 2000).

The easiest homes to adapt were found to be ground floor flats or bungalows with two bedrooms or more, a single level floor plan and spacious layout with rooms running off halls or landings, large bathroom and cupboards, internal stud partitions and timber floors. The most difficult or costly to adapt are older one bedroom or bed-sit properties, two storied houses, houses with changes in floor level, houses with restricted internal layout, small bathrooms with no room for enlargement and restricted space around the outside of the property for ramps, scooters and extensions. The most costly AT to install were lifts and hoists, which require modification of the building and the cheapest were grab rails (Tinker *et al.*, 2004).

6. AN INTEGRATED FUTURE?

Accessibility of mainstream housing is critical if disabled people are to avoid being locked into limited housing options determined by the level of mobility impairment, regardless of a person's other needs, for example for employment, or the needs of family members who are not disabled (Zola, 2005; Joseph Rowntree Foundation, 1995; Beresford and Oldman, 2000; Louie, 1999). Similarly, mainstream housing accessibility is critical if ageing in place

is to become reality rather than rhetoric. However the prospects for transforming the mainstream stock in the short term have been found to be low.

Overall, the development of accessible housing is still characterised by sporadic and uncoordinated development in most jurisdictions. It is clear that customised modification of housing is eased if the mainstream housing stock is designed to meet high degrees of accessibility. However, take-up of universal design in the mainstream stock is still relatively limited in most countries. Increased housing accessibility requires a simultaneous focus on existing as well as new stock, although the ability to provide incentives and acceptance of regulatory requirements is greater in relation to new stock rather than existing dwellings. Internationally, despite rising demand for accessible housing, market responses to that increasing demand are weak. Those countries most successful in promoting a market response are those that systematically combine regulatory, incentive and collaborative capacity building strategies (Darcy, 1999; Lawler, 2001).

Regulation is not, in itself, sufficient. A 1996/97 survey of 18 countries in the European Union found enforcement of accessibility standards was generally poorly policed. There must be a consumer commitment to accessibility as well as a housing sector and building industry commitment if accessibility is to be mainstreamed and disabled people are able to find houses that allow them to participate in their families and communities (Nielsen, 1998).

The three countries that appear to have been most successful in engaging the private sector in providing accessible mainstream housing (Japan, Norway and USA) offer either financial incentives and/or strong legislative or regulatory frameworks. Overall, it appears that private sector involvement in providing accessible housing is still relatively limited. Financial incentives in Norway and Japan have been shown to encourage the incorporation of universal design into new buildings by private sector developers (Kose, 2004; Kyoyo-hin Foundation, nd; Kawauchi, 2005; Eia, 2006). Japan and Norway have also put considerable effort into countering consumer resistance.

There is some evidence of consumer resistance to the purchase of new adaptable housing, both from a design aesthetic perspective and from a perception that adapted housing carries with it a social stigma. Other influences are cost increases and a lack of perceived need by younger consumers to own a 'Smart Home' (Kose, 2004; Biocca and Dewsbury, 2004; Joseph Rowntree Foundation, 2000). The perception is that accessible housing is of lower design quality and built in undesirable locations. This is a disincentive for private developers, except where strong financial incentives are in place. Adaptable or universal design homes are also more expensive to build, although not excessively. Most estimates of the increase in cost to build in adaptable features are between one and five percent of total construction costs. Both Japanese and Norwegian researchers report that incorporating good architectural design into adaptable housing has assisted its uptake in their private housing markets. They also note partnerships between builders, architects and disability organisations are important for successful housing outcomes (Nielsen and Ambrose, 1997; Kose, 2004). There is some evidence from the building industry in the USA that market appeal of new homes has been increased through incorporating life time design features (American Association of Retired Persons, 2006; American Institute of Architects, 2005).

There is debate about how much progress is being made in making mainstream stock accessible. Ambrose (1998) argues that while it is important, wheelchair access is not sufficient. He presents cross-country European Union evidence of prevalence of types of disability which shows wheelchair users are amongst the least prevalent group. Hearing impairment, allergies, difficulty in walking, intellectual impairment and reduced strength and coordination, are all well ahead of wheelchair bound, in prevalence per 1,000 people.

This contrasts to some extent with New Zealand, where some kind of physical disability is most common (65 percent of adults). Sensory disabilities and 'other' disabilities are the next most commonly reported types of disability (Statistics New Zealand, 2001; Saville-Smith and James, 2006).

In Australia too doubts have been expressed about increasing the accessibility of the mainstream stock, especially through the use of incentives. The Australian Network for Universal Design Housing, which operate under the aegis of People with Disability Australia, argues that the supply of accessible housing in Australia is piecemeal, inadequate and of inconsistent standard (Herd *et al.*, 2003; Ward, 2005). Although there are some incentives for home owners and developers, in some states, renovating or building housing with enhanced accessibility is not widespread in practice and commercial developers have put housing on inappropriate sites (Bridge, 2005).

Overall, the three most successful strategies to encourage new mainstream accessible housing appear to be financial incentives sufficiently large to attract private sector housing developers, adoption of elements of universal design into planning and building codes, and strongly enforced building code regulations. The least successful strategies appear to be voluntary guidelines, branding of universal designs and information campaigns designed to encourage the incorporation of accessible features into homes. This is reflected in a clear trend for Governments to incrementally establish more prescriptive policy and regulatory frameworks, in order to increase the supply of mainstream accessible housing, services and urban environments. In societies where populations are ageing faster, regulations for new housing are more likely to be compulsory, apply to aspects of private as well as public sector housing, and to have been in place for a longer period of time.

For disabled people, however, the immediate issue is often the modification of the house in which they and their families live. In most countries social housing still provides the majority of accessible housing units, either through direct provision or through non-profit housing intermediaries. The most urgent housing needs for disabled citizens are met everywhere by some form of public or assisted housing, while retrofit programmes and private sector new builds are still largely supplementary sources of accessible housing stock. Moreover, housing modification programmes tend to be relatively modest in relation to need and, perhaps even more importantly, the building industry has frequently been unable to provide a good service. A survey undertaken for the European Union HELIOS 11 Programme (Nielsen, 1998) found that administrative practices for payment of subsidies and for building work were poor, housing modifications do not always match the existing design standards, advice about getting and making adaptations was patchy, and services in rural areas were particularly poor.

In Australia the Disability Council of NSW (2005) reports that some housing built to AS 4299 is incorrectly passed as compliant. They claim many buildings with modifications such as widened doorways and wheelchair accessible kitchens/bathrooms, still have inaccessible areas such as verandas. They argue that those inspecting housing need to improve their familiarity with accessibility requirements. Moreover, the existence of a quality reporting framework for a housing provider does not necessarily indicate a quality service (Bridge, 2005).

Internationally it has been observed that there are typically a lack of comprehensive quality assurance and accreditation systems for disability assessment, housing need assessment, accessible housing design and construction. In general, evidence of quality assurance processes was either not able to found, or reported as either weak or non-existent. There are various building code requirements and guidelines to cover construction aspects of access, but no evidence was found that the professionals engaging with disabled people

and buildings have specialist training in disabilities. Conversely, others such as social workers, doctors and local government housing workers, appear to have no training in design or construction.

Beresford and Oldman (1998, 2000), found that local authority housing services for disabled children in the United Kingdom were characterised by long delays in assessments and modification work, poor assessments, poor outcomes of modifications (only twenty percent of families reported the problems were solved), and, persistence of poor quality, unsuitable and over-crowded housing. Typically there is limited voluntary or mandatory training in disability for the health, housing and social work professionals involved in the disability and housing assessment systems and processes.

This was also true for the architects, designers, developers and construction industry professionals, who design and construct accessible housing. There are however, numerous short courses on specific topics. Some of these are included in graduate and undergraduate housing related degree programmes, of which the Australian HMM Information Clearing House is one example. It is a university-based, non-profit organisation funded by the NSW Department of Ageing, Disability and Home Care to develop a knowledge base and information resource on home modification and maintenance. It provides graduate and under graduate courses in housing modification and has extensive online resources of evidence based, good practice reviews on most aspects of housing modification. The Royal Australian Institute of Architects (RAIA) also runs both a national training programme and accredited, continuing education courses.

Given the problems internationally experienced in generating an accessible mainstream stock and getting adequate home modification, there is also an international concern to use accessible stock more efficiently by matching stock with house seekers. Registers of accessible housing stock have been developed in several countries, most notably the United States and Norway. In other countries there are local and state or regional examples. Registries are operated by a range of agencies including central government, local government and non-profit organisations.

When looking to the future for accessible housing for people with disabilities, several key points emerge from this review:

- An individual approach to accessible housing does not meet the needs for disabled people for accessible communities, social and work environments.
- Housing modification schemes are unlikely, in current form, to be a sufficient response to meet growing need.
- Universal design features do not meet all the housing needs that arise for people with moderate or severe individual disabilities. The need for customised modification will remain.
- The influence of the accessible housing movement is increasing as policy discourses between ageing-in-place and disability converge and the political influence of older disabled people grows.
- The current generation of younger disabled, and the next generation of older disabled people are more open to use of assistive technologies.
- Mainstreaming new accessible housing design through regulation will have a limited effect in the short to medium term. Most disabled people will live in existing stock.
- Consumer resistance to universal design homes is definite but on evidence, can be overcome with attention to good aesthetic design.
- The realignment of the stock will require increased capacity and expertise and will take time.
- The efficient use of existing accessible housing stock is increasingly becoming a focus of attention in some countries.

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Recommendation 3: Adopt a national disability strategy and. My house and my workplace have been made accessible for me.

Computer experts have supported me with an assisted communication system and a speech synthesizer which allow me to compose lectures and papers, and to communicate with different audiences. But I realize that I am very lucky, in many ways. This landmark international treaty reinforced our understanding of disability as a human rights and development priority. People with disabilities were asked about their domestic and overseas tourism patterns. A second study was made in 2001 in the Australian state of Queensland (Market & Communications Research 2001). In general, accessibility was the major issue for letting senior or disabled people feel confident that they could spend leisure time as tourists and that they would not face too many barriers. A number of papers have highlighted the impact of international and national air regulations on travel by people with disabilities (Driedger 1987; Abeyratne 1995; European Civil Aviation Conference and European Conference of Ministers of Transport 1995; Canadian Transport Agency 1997). The major air transport issues identified are