UNIVERSAL HOUSING DESIGN
“IT MAKES GOOD SENSE”

MARGARET WARD

Margaret Ward is an architect and developed an interest in universal design through her work in the Department of Housing. She was awarded the Public Service Medal in 1996 for her work for people with a disability. She has convened the Australian Network for Universal Housing Design for the last three years.

Abstract
Current housing design ignores the needs of many people. A serious consequence is the isolation, exclusion and discrimination of people who are vulnerable or who have a temporary or permanent disability or illness. 19% of the population in Australia has a disability. This number will significantly increase in the future as the population ages. When their families, friends and community-based workers are added to the equation, a very significant percentage of the population are affected.

The design of housing urgently needs to be improved to meet the needs of all people. This paper will compare the consequences for the Australian community in the next 10 years if timely action is taken with the consequences of maintaining the status quo.

The paper will then interpret how universal design is compatible with the broader notion of sustainability and can contribute to all three of the desired social, environmental and economic outcomes.
WHY UNIVERSAL DESIGN IN HOUSING?

Universal housing design
Universal housing design draws on the principles of universal design to create flexible housing that is more comfortable for people with varying abilities and at different stages of their lives. It avoids building barriers that discriminate against people living in or visiting the home. A universally designed home can also be readily adapted to meet changing needs.

Principles
The seven principles of universal design can apply to housing in the following ways.

Principle One – equitable use
Housing design should be useful, appealing, and marketable to all potential home owners with diverse abilities.

Examples include:
- covered or enclosed garages with level approach to the house
- level principle entrance with a landscaped approach on a sloping site
- power-assisted garage entrance doors
- external and internal sensor lights.

Principle Two – flexibility in use
Housing design and product selection should accommodate a wide range of individual preferences and abilities.

Examples include:
- at least two living spaces on the ground floor level of a dwelling, to accommodate a ground floor bedroom or office space in the future
- aligning front and rear entrance doors and considering room configurations to facilitate dual occupancy as a mortgage-helper or in the event of an elderly parent moving in due to illness
- kitchen counter tops at both a standing and sitting height to accommodate reduced standing endurance, temporary and long term mobility impairment, and small children.

Principle Three – simple and intuitive use
Housing design and layout should accommodate all home occupants regardless of occupants’ past experience, familiarity or cognitive ability.

Examples include:
- consistent location of light switches throughout a dwelling
- level access throughout the home reducing risk of injury and falls.
- logical layout or rooms within a home dwelling in addition to open plan living spaces
- avoidance of long corridors.
- entrance doors are defined to ease orientation.

Principle Four – perceptible information
Housing design should communicate environmental information to the home occupant, regardless of ambient conditions and ability.
Examples include:
- product selection and insulation options selected to enhance acoustic clarity
- switch designs for lights and general purpose outlets which are uniform, easy to use and detectable
- selection of appliances (i.e. ovens, washing machines, alarms) which incorporate audible/visual cues and flexible installation options.

Principle Five – tolerance for error

Housing design minimises hazards and adverse consequences of unintended actions.

Examples include:
- automatic cut-off cook-tops and cool-plates which are only activated in contact with cook-pans
- installing double-cut door locks to allow keys to be inserted into a keyhole either way
- safety switch activation to prevent electrical surges and accidental overload.

Principle Six – low physical effort

Housing design and product selection should be easy, comfortable, and efficient to use to accommodate a wide range of individual preferences and abilities.

Examples include:
- window operation units located at a height that is within both standing and seated reach ranges, requiring only single-handed operation
- shower amenities that accommodate both standing and seated showering positions
- lever style door hardware and taps.

Principle Seven – size and space for approach and use

Design of living spaces to ensure areas are provided for approach, reach, manipulation and use regardless of the home occupants’ body size, posture, or mobility.

Examples include:
- covered entrance doors and generous internal foyer areas
- Wider internal corridors to ease moving of furniture and assist approach to doorway entrances for people using mobility equipment
- providing reasonable circulation space between fixed furniture and fittings such as kitchen cupboards and bathroom amenities.

Minimum Performance Measures

Possible Minimum Performance Measures for universal housing design are as follows:
1. There is a clearly discernable accessible path of travel from the front boundary or car park and throughout the entry level of the dwelling.
2. The entry level has a living and food preparation area, bathroom, WC and bedroom, all of which can be used by a person in a wheelchair.
3. All rooms, when furnished or fitted out, allow for adequate circulation space for a person using a wheelchair.
4. All doorways and corridors are wide enough to allow a person using a wheelchair to manoeuvre into and out of rooms.
5. Door furniture, switches, controls and outlets are within reach of and can be used by all.
6. There is potential for future adaptation to a dwelling with two or more levels for vertical access by a person using a wheelchair.
7. Walls and ceilings are reinforced where assistive devices may be attached.

Benefits
Universal housing design brings significant benefits to the resident, including the following:
- Physical restrictions due to ageing, childbearing and rearing, injury or illness are more readily accommodated if the physical environment can be easily adapted to individual needs.
- A wide range of individuals and families can occupy a dwelling cost-effectively and equitably over the life of the building.
- Residents will benefit from these features throughout their lifetime as their needs change.
- Residents can invite family and friends to visit or stay in their home for extended periods at short notice – regardless of their age or physical capability.
- Homeowners can expect an increase in resale value.

There are also benefits for government, including the following:
- There will be a reduced need for modifications, assistive equipment and paid assistance for daily living tasks.
- There will be fewer injuries, particularly among older people and young children.
- There will be reduced demand for alternative care for older people and people with a disability, as they can stay in their own home longer.
- There will be reduced demand for, and more efficient use of, acute hospital care and rehabilitation.
- There will be safer work environments for carers and visiting workers.

Sustainable housing
Universal housing design is part of the broader concept of sustainable housing. A sustainable house is designed with people in mind; it is safe, secure and universally designed. It is cost efficient over time, comfortable, cheap to maintain and complements our unique environment. Sustainable housing provides “triple bottom line” outcomes – economic, social and environmental – for the life of the dwelling.

Demographic context
The most significant of Queensland’s projected demographic trends over the next fifty years is an anticipated increase in the population of older people and people with a disability. Anticipated changes in family structure and in the living arrangements of children and young people are also significant.

In Australia some 2.6 million carers provide assistance to others who need help because of their disability or age. Women are also more likely to provide the majority of informal care to a person with a disability (71%). One in 10 people in Australia use equipment or an aid to help them cope with their condition or manage their everyday life.

Regional populations are also projected to age more rapidly than capital city populations, given that regional areas already have older populations and lower projected growth rates.
There are 5.5 million families in Australia, 60% of whom have children. Most children live as one family households, however 1.1 million children aged 0-17 years (23%) have a natural parent living elsewhere. Of these children, 76% live in one parent families, 13% in step families and 9% in blended families.

Many households change on a regular basis, with various family members coming and going over time. Young people over fifteen are the largest group of temporary residents. Children of separated or divorced parents visiting their non-resident parent make up over one-third (36%) of all sons and daughters who are temporary residents.

In summary:
- the population of Queensland is both increasing and ageing
- disability and the need for assistive equipment increases with ageing
- regional populations are ageing more rapidly than capital city populations
- women are more likely to live longer than men
- women are more likely than men to provide care within the home
- many children have two (or more) families and homes and regularly move from one to the other
- older sons and daughters are the group most likely to go from, and return to, the family home over a number of times, as temporary residents.

ADOPTING UNIVERSAL DESIGN IN HOUSING

1. Existing initiatives

Queensland
From 1997 the Queensland Department of Housing has included universal design features in most ground-level social rental housing. The Department’s Smart Housing Program also encourages Queenslanders to design, build and purchase homes that are more sustainable over time. Universal design is included under the banner of sustainability.

Across Australia
A number of local councils across Australia have developed access regulations and guidelines for housing. These differ according to perceived need and local interpretation of existing standards. Typically, councils that have a high population of retirees or those that are innovative in addressing future demand are taking action. Of note are the building and development application guidelines of Salisbury City Council (SA), Willoughby City Council (NSW), Noosa Council (QLD) and Melbourne City Council (VIC).

The Australian Network for Universal Housing Design has garnered a strong network of organisations and individuals calling for access requirements for all new and extensively modified housing to be included in the Building Code of Australia. In response, the Australian Building Codes Board (ABCB) with the Building Commission (Victoria) have contracted an independent consultant to examine the supply and demand for accessible housing, assess the implications for the future, and recommend strategies for the short, medium and long term, including regulation. The findings are expected to be publicly available in mid 2005.
Standards Australia is currently reviewing the Adaptable Housing Standard (AS 4299) to align this with the suite of access and mobility standards (AS 1428), in readiness for any possible future regulation.

Overseas
In 1999 England and Wales made changes to Part M of the building regulations, which would require all new dwellings to have wheelchair access and a ‘visitabile’ ground floor toilet. Following self-government, Scotland has developed similar regulations. Northern Ireland introduced amendments to its Building Regulation in 2001 to achieve harmony with Scotland, England and Wales. Over the past 20 years European countries have followed the European Concept for Accessibility. In Japan Regulations now require that all new housing, about one million dwellings, should be built for 30 years of ‘liveability’, to universal design principles.

ISSUES

Adoption by industry
Currently, there is little incentive for the larger building companies, who construct 70% of Queensland’s housing, to change their complex design and construction programs. Smaller family builders have traditionally been conservative in their design and building practices.

There are indications of a change within the industry, with some developers and builders identifying a market advantage in providing well-designed accessible housing. Those builders who have included universal design features into their plans from conception have found that these can be added with minimal effect to cost and [AH1].

Choices by home buyers
The average house changes owners every seven years. Buyers are more likely to be influenced by the builder’s design preferences than by their own long term personal or climatic needs. This is evidenced by the proliferation of new homes for sale which have little capacity to meet the needs of residents over the dwelling’s lifetime. If a dwelling has an expected lifespan of sixty years, at least eight other families are likely to be affected.

Emphasis on home-based care
It is likely that the care of older people and people with a disability in Australia will place severe strains on government budgets. It also is expected that access to specialised accommodation facilities (hostels and nursing homes) will diminish over time.

The private cost of caring for older people is also likely to increase, either because family carers will be obliged to leave employment, or families will incur the expense of paid support to assist in the caring process. Further, the ageing phenomenon is occurring at the same time that traditional community and family-based support appears to be weakening.

In anticipation of an increasing demand for public welfare, governments are supporting a policy direction of community inclusion, family based care and ‘ageing in place’.

Need for greater home safety
Falls are the most common cause of serious injury among older Queenslanders, and account for the largest proportion of all injury-related deaths and hospitalisations. Two-thirds of all
falls (65%) occur in the home. Injury is the biggest cause of death in children, with most childhood injuries also occurring in the home. Most injuries at home are preventable and predictable. There are many contributing factors in home injuries, however the design of the home itself plays a significant role, particularly in the safety of more vulnerable residents.

**Current reliance on modifications**

Modifications to dwellings can enable people to stay in their own homes and avoid injuries. However, more than 90% of Queenslanders of all ages with a ‘core activity restriction’ have had no home modifications to improve their quality of life. There are several possible reasons for this.

- Retrofitting access and safety features is more costly than including them in the original design. The investment is seen as overcapitalising as the modifications rarely add value to the property.
- Most Australian houses are not designed to be easily modified. Many older people prefer to continue living in their own homes in familiar surroundings, even if they are unsafe.
- Some 12% of Australians aged over 65 years rent in the private or public housing markets. These residents are particularly vulnerable – they typically have low incomes and no other assets; landlords are often reluctant to modify rental properties.
- Assistance for modifications is not readily available.

**Confusion in regulations and standards**

The existing established standard, Standards Australia’s Adaptable Housing Code (AS 4299), is now ten years old. Its original concept of adaptation has been overtaken by a more informed understanding of access, universality and community inclusion. In response, a variety of local guidelines and codes has been developed. The lack of a comprehensive national code or standard is already causing concern for the housing industry and consumers.

At the same time, industry peak bodies caution against greater regulation. Any change has initial costs for the industry and these costs are inevitably passed on to the consumer. Nevertheless, there is an understanding that, if regulation is clearly necessary, a concise national code for universal housing would be welcomed by everyone.

**LIKELY CONSEQUENCES OF NO ACTION**

**Greater pressure on subsidised and specialised housing**

The lack of affordable, universal housing in the private market has already placed a disproportionate demand for accessible housing on subsidised housing programs. In turn, the limited growth in subsidised housing programs has precipitated an accommodation crisis for poorer people with a disability and for older people.

**Damage to informal support networks and community connections**

The design of people’s homes affects far more than those who dwell in them. People with mobility impairments are less able to visit their friends, neighbours and relatives. Over time this indirect social exclusion and isolation impedes people’s capacity to remain well and recover. It also erodes established support networks and community connections. This in
turn undermines government policy directions for home-based care, community engagement and social inclusion.

**Denial of home-based services**
The home has increasingly become a workplace for a wide range of people including removalists, professional cleaners, childcare and support workers, and allied health professionals. Some support services are already denying some services to residents who live in inappropriate housing, due to workplace health and safety requirements for their staff.

**Increase in costs of home-based injury**
Most home based injuries are preventable. The total lifetime cost for falls-related injuries in Australia is expected to reach $1 billion by 2021 – more than double those of transport-related injuries. These costs, together with those from preventable childhood injury and death caused at home, will continue to be a major and unnecessary budget item.

**Increase in avoidable admissions to acute hospitals**
Older people are significant users of hospital services, presenting at hospitals more often than other age groups and occupying a high proportion of beds. While people 65 years and older represent some 12% of the Australian population, they account for 44% of avoidable hospital admissions\(^{15}\). Many of the proposed support and prevention strategies designed to keep people out of expensive institutional care will be ineffective unless housing is accessible.

**COSTS AND BENEFITS OF UNIVERSAL HOUSING DESIGN**

**Cost increase to housing**
It is anticipated that accurate and current analysis of the costs of universal housing design features will emerge from an independent study being undertaken by the Australian Building Codes Board and the Building Commission in Victoria (ABCB/BC).

In its absence, the most comprehensive study available of the costs of universal housing design (here called adaptable housing) is by PDA Urban Economists, commissioned by the New South Wales Government in 1999. In his paper to the 1999 Adaptable Housing Conference, Martin Hill, director of PDA, provided the following data\(^{16}\).

More recent comparative costings were provided by industry representatives in Brisbane. They identified that adaptations to a traditional design would cost up to 20% more than the inclusion of universal design features within the original design, and that such features would incur a minimal cost increase. The skill of the designer was identified as the major determinant for minimising cost increase.

However, the real winners will be governments, with anticipated cost savings through home based services and maintaining people within communities and families.

**Recommendations**
It is recommended that:

**At the national level**
1. The Building Code of Australia (BCA) is amended to deliver the above mentioned desired outcomes for universal housing design in Class 1, 2 and 3 dwellings.
2. The Australian Government introduces changes to the *Disability Discrimination Act 1992* to ensure the Act applies to housing development, design and construction.
3. Standards Australia completes the review of AS 4299 in order to align this standard with the suite of access and mobility standards (AS 1428) in both philosophy and minimum standard.

**At the local government level**

4. Incentives are introduced for developers and builders to build housing that incorporates universal design features above the minimum standard.

**At the industry level**

5. Industry provides training in universal housing design.

**CONCLUSION**

While the current ABCB/BC study will more clearly illuminate the policy urgency behind universal design, it is clear that if the demographic changes in Australia are as dramatic as some analysts predict, there is an immediate need to introduce appropriate policies in universal housing design across a range of sectors.

The main priority should be for the housing industry to generate the best possible living environments for all Australians of all ages. Further, the consequences of demographic changes will be exacerbated if there are no changes to current building practices. Further, the adoption of universal housing design will generate substantial social and economic benefits, even in the absence of these demographic trends.

Without exception, other Western countries that are grappling with similar issues have resorted to legislation and regulation. However, this has been preceded by extensive education of the industry, and advocacy from the community and government sectors.

**REFERENCES**


“Universal Housing Design – It Makes Good Sense” by Margaret Ward


10 Queensland Department of Housing (2004).


14 The Australian Bureau of Statistics delineates four levels of core-activity restriction, based on whether a person needs help, has difficulty, or uses aids or equipment with any of the core daily activities (communication, mobility or self care).

15 Siggins Miller, Department of Health and Ageing (2003) *Unnecessary and avoidable hospital admissions for older people*

16 Hill, M. ACT Adaptable and Accessible Housing Conference (1999), *Breaking into adaptable housing: a cost benefit analysis of adaptable homes* pp 4-5.