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Universal Design in Housing:

Is it the answer for home design for the aging population?

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Abstract

The aging of Australia's "baby boom" generation has prompted calls for universal design and other design approaches such as accessible design, barrier-free design, visitable design and adaptable design to be incorporated into Australian private housing. This study identified and examined some of the issues that need to be considered in order to provide better access to appropriately designed private homes for the aging population, and explored the potential for universal design to provide this access.

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Universal Design has the potential to provide housing that will be usable and useful to the Australian population irrespective of age or ability. In particular, Universally Designed housing could promote independence in older people and also assist with the provision of care for those housing occupants who are care dependent, allowing them to age in place. Most importantly, perhaps it is a means for the ageing generation to plan their future home, well in advance of any decreased level of ability.

This study explored some of the issues that should be considered in the debate on Universal Design in Australia, in particular, the scope of Universal Design and its benefits compared to other methods of providing accessible housing, implementation of Universal Design, and the role of Universal Design within the concept of home.

Background

> Population ageing was a defining characteristic of all developed and many developing nations in the latter part of the 20th century. It is a trend that is set to continue into the 21st century, and Australia is no exception. (Australian Institute of Health and Welfare [AIHW], 2002, p8)

In the year 2011, the first of the baby boom generation will be turning 65 and the proportion of Australians over 65 years is expected to have risen to at least 14% of the population. Within the following decade, the population over 65 years will outnumber the population of children under 15 years, with the difference in numbers of these two age cohorts expected to increase in the future (Australian Bureau of Statistics [ABS], 2000c, p75)

As is the case in many other countries, there have been numerous enquiries, conferences, research programs and policies to address the aging of the Australian population. There also continues to be considerable research into, and attention given to, the

housing requirements of Australia's aging population, prompted in part by the size of the baby boom cohort (Faulkner & Bennet, 2002; Kendig, 1999; Kendig & Neutze, 1998; RMIT University, 2003).

The vast majority of the current population 65 years or older live in private housing and more than three quarters of this private housing is owner-occupied and mortgage-free. Public housing tenants account for less than 6% of the population over 65 years (AIHW, 2002, p22). While some states have access policies for the design of their public housing stock, Australia currently does not have any regulations or a building code that enforces Accessible, Barrier-Free, Visitable, Adaptable or Universal Design features in private housing, where the majority of older people live.

Currently, Australia has two categories of access standards that relate to housing. The first one, *AS 1428 Design for Access and Mobility* range of standards applies to public buildings and spaces, and the first part of this series *AS 1428.1-2001 General requirements for access - New building work* (Standards Australia, 2001) is referenced by the *Building Code of Australia* (Australian Building Codes Board, 1996) for public buildings. Though not intended for private housing, it does provide access guidelines that can be applied to housing, for instance, dimensions and features of ramps, walkways, doorways and handrails; layout of bathrooms; and position and size of door handles and electrical switches. A disadvantage of these access guidelines is that they are based on empirical testing of people between 18 and 60 years of age (Standards Australia, 2001, p6), so their application for an older age group is questionable.

The other access standard, *AS 4299-1995 Adaptable housing* (Standards Australia, 1995) is focused on housing that will suit a person with "any level of ability" (p4) in the future. The standard specifies that housing shall be "visitable", have no steps, and generally have the circulation space requirements of *AS 1428.1-2001.* The requirement for being

visitable is "one wheelchair accessible entry with an accessible path of travel to the living area and to a toilet that is either accessible or visitable (minimum 1250mm in front of toilet x 900mm wide clear of door swings and fixtures)" (p8). The objective of the standard is to provide for the needs of people with physical disabilities, sensory disabilities and intellectual disabilities (p10). Generally, *AS 4299-1995 Adaptable housing* provides performance measures, but is non-prescriptive. The strictest requirements relate to circulation space and access; many of the other requirements need only to be able to be incorporated into the house at a later date, at a minimum cost.

Though not enforced by building regulations, *AS 4299-1995 Adaptable housing* is referenced for specialized housing policies in various states. Queensland references the standard in its "Smart Housing" policy, intended to make all public housing sustainable. Of the three components of sustainability for Smart Housing, (social, environmental and economic), Universal Design is a criteria of social sustainability, along with safety and security (Queensland Department of Housing [QDH], 2002a). The Universal Design requirements consist of performance requirements, along with some prescriptive specifications, particularly for kitchens, bathrooms, and for all fittings and appliances that must be selected from a predetermined Schedule of Accepted Products.

Another state policy to reference *AS 4299-1995 Adaptable housing* is the New South Wales *State Environmental Planning Policy No. 5 - Housing for Older People or People with a Disability (SEPP5)*. This policy "aims to create more and better suited (public and private) housing within the community for older people and for people with disabilities" (NSW Department of Urban Affairs and Planning, 2000, p1).

There is currently a push by some housing and accessibility groups, for Universal Design, *AS 4299-1995 Adaptable housing* and/or aspects of Accessible Design, Barrier-Free Design, Visitable Design or Adaptable Design to be incorporated into the general housing

market, or regulated through the *Australian Building Code* (Accommodation Blueprint Steering Committee, 2003, p52; Australian Building Codes Board, 2003; Bridge, Kendig, Quine, & Parsons, 2002, p40; Building Commission Victoria, 2002; Local Government and Shires Associations of NSW, 2000; Master Builders Association of the ACT, 2001; People with Disabilities, n.d.; Planning SA, 2002; QDH, 2002c).

Some of the issues that need to be considered in order to provide better access to appropriately designed homes for the aging population and the potential for Universal Design to provide this access, are the scope of Universal Design, methods of implementing Universal Design, the role of regulations and the contribution of Universal Design to providing a home.

The Scope of Universal Design

As is the case in other countries, in Australia the term 'Universal Design' in housing is often grouped with or interchanged with the terms 'Accessible Design', 'Barrier-Free Design' 'Visitable Design' and 'Adaptable Design'. When Universal Design is to be considered, it is important to have a clear and common understanding of its meaning and scope compared with alternative methods of providing access in housing. The definition of Universal Design for this paper refers to the Centre for Universal Design's 1997 definition: "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." (Connell et al., 1997) with accompanying principles and guidelines: equitable use, flexibility in use, simple and intuitive in use, perceptible information, tolerance for error, low physical effort, and size and space for approach and use. The additional guidelines for reduced cognitive ability (Calkins, Sanford, & Proffitt, 2001), such as avoiding confusion and minimizing learning, are also considered.

A number of methods have been used to differentiate Universal Design and Accessible (or Barrier-Free) Design. One distinction is based on principles versus rules: Accessible Design is design that complies with certain access rules and standards to ensure that the

majority of the population, including those who rely on a wheelchair can use the building (Building Commission Victoria, 2002; Mace, 1998; Ostroff, 2001, p1.5; Standards Australia, 1995, p8). Another distinction is based on inclusiveness: Accessible Design provides 'special' designs that are different and separate from the designs for the rest of the population (Standards Australia, 1995, p4; Steinfeld, 1994). A third distinction is based on focus: Accessible and Barrier-Free Design are focused on the elimination of barriers in the built environment for people with disabilities whereas Universal Design is concerned with a usable environment for everyone irrespective of ability or disability (Steinfeld, 1994; G. C. Vanderheiden & Vanderheiden, 1992, p6).

Some confusion between Accessible and Universal Design arises from products and interiors that are quite institutional in appearance, particularly bathrooms with an abundance of stainless steel (or even primary colored) grab rails and specialized assistive technology, being described as Universal Design. Although Universal Design originated with a "recognition that, because most of the features needed by people with disabilities were useful to others, there was justification to make their inclusion common practice" (Mace, 1998), it should not be assumed that an Accessible Design for a population with disabilities will always be the best (or even an acceptable) design solution for the entire population.

Visitability has been described as "a major first step toward universal design" (Truesdale et al., 2002, p8). Its focus is on accessibility in key areas of the house for people with mobility impairments and particular, wheelchair users. Its role in Universal Design in housing concentrates on physical access to certain areas of the home by people with particular disabilities only, though there could be some benefits for other users.

Another source of confusion with Universal Design is the fact that no product or environment can be truly universal, as it can never be suitable for all users (Covington & Hannah, 1996, p7; Mace, 1998; G. Vanderheiden, 2000; G. C. Vanderheiden &

Vanderheiden, 1992, p6-7). As some impairments or disabilities will prevent certain people from using a Universal design, designers can only aim to make the design usable for most people. Of course this raises the question: who should be included in the group of "most people" and who can be left out? Can those people with the most profound disabilities be left out (and who decides what constitutes a most profound disability)? What about those people whose disabilities are quite rare - can they be left out? If some groups of users have conflicting user requirements, which users have priority?

The requirements for public housing in Queensland's Smart Housing Policy include a specification for "universal" kitchen benches based on *AS 4299-1995 Adaptable housing* to be 850mm above the finished floor (QDH, 2002b; Standards Australia, 1995, p25). This fixed-height bench would be well down in the Universal Design hierarchy (Mace, 1998), and although it may be a suitable height for shorter people and wheelchair users, it could well be too low for tall standing users, and too high for ambulant users who need to sit on regular chairs (not to mention children), while undertaking cooking tasks. These types of specifications are perhaps considered to be the best compromise in their particular markets; however, they could suggest that as universal features they would be suitable for occupants with certain limitations when they are not.

The principles of Adaptable Design in *AS 4299-1995 Adaptable housing* (Standards Australia, 1995) have some similarities with those for Universal Design, particularly "Adaptable housing design is good design for everyone" and "Suitability for people with any level of ability" (p4). Some of the housing features in the standard could be regarded as Universal Design, such as specifications for entrance ways and circulation space, but many other specified features that would be required for people with mobility disabilities are only required to be adaptable.

This standard illustrates two issues of conflict between Adaptable Design and Universal Design. Firstly, the adaptability in the standard emphasizes adapting the house to cater to increasing disability, with little attention to adapting the house back. For instance, consideration is given to removal of a non load-bearing wall partition separating the bathroom from the toilet, along with an additional doorway if extra space is required in the bathroom, and to the installation of grab rails. However, there is little consideration regarding replacement of the partition wall and doorway should the space not be required, or to the removal of rails. Older people with disabilities could be concerned about the difficulty of undoing adaptations for disability in their house, and the negative impact that adaptations for disability could have on the value of their property (Mullick, 1993). The expense and labor required to return the house to its original state could have an impact on the willingness of occupants to make changes, particularly for non-permanent disabilities. Secondly, the standard appears to focus on the disability, over the other non-access needs of the people in the house (including the person with the disability). Would a family's need for a toilet separate to the rest of the bathroom diminish if one of those family members had a disability? In this case, a more universal option such as an adjustable concertina door or another style of 'removable' wall could cater to both needs.

Reviewing Universal Design in relation to other methods of design access reveals the importance of defining and using the term accurately for housing design. Barrier-Free, Accessible, and Visitable Design comprise only a small focus of the overall scope of Universal Design. As Universal housing cannot be usable by everyone, despite the best intentions, perhaps there does need to be some additional information regarding the ability of the users that Universally Designed housing has been designed for. Well-lit stairs with non-slip broad treads and handrail could be ideal for an older frail person with reduced mobility, yet are inaccessible to a wheelchair user; just as a lift with backlit brail buttons, sensor doors

and audible notification of floor level could be inaccessible to a person with no use of their arms or a person with dementia. In the case of a conflict of needs among users, one option is that those needs that are most important to the target group could take priority. Older people often live with others, have visitors of all ages (and abilities), and are significant providers of child-care (ABS, 2000a); while the needs of older people cannot be viewed in isolation, they may need to take precedence in older people's housing.

A more inclusive approach would be an "adjustable" style of adaptability, a form of "mass customization". "Adaptive customization" provides "one standard, but customizable, product that is designed so that users can alter it themselves" (Gilmore & Pine II, 1997) and is now a common approach in computer software. In situations where there is a conflict between the needs of different occupants in a household, or the needs of an occupant are changing; adaptive customization is a far more flexible, and hence universal solution than the Adaptive Design approach.

Focus on the aged population

Focusing a Universal Design approach on specialized "aged housing" does pose a level of contradiction with Universal Design principle one, regarding equitable use: the design being marketable to all users and avoiding segregation of users (Connell et al., 1997). Aged housing in the community, such as New South Wales' legislated "over 55's" housing illustrates the irony of such a regulation: this type of in-fill housing does have broad market appeal to all age groups. It is located within 400m of a doctor, shops and amenities, or within 400m of transport to these facilities. There are large interior circulation spaces and wider doorways. All outdoor areas are fully accessible, and it can be built in areas that are zoned for residential houses only, yet can include low-rise apartments ("State Environmental Planning Policy No 5-Housing for Older People or People with a Disability," 1998). A

mother with a baby or a couple of toddlers and without access to a car is one of many others who could also find these features quite appealing!

The housing difficulties experienced by many older people due to disability or limited income are well known. While older people generally experience higher levels of disability (ABS, 1998, p13) and higher levels of disability are linked to lower income levels, there is no direct relationship between age and disability. The older population complains about the stigma of aging and the discrimination experienced due to age being used to imply diminished abilities (Human Rights and Equal Opportunity Commission [HREOC], 2000a) so perhaps age-based regulations for access to housing need to be reconsidered. The majority of 55 year olds, and many people much older, do not have a disability (ABS, 1998, p15) and are still in employment (ABS, 2003, p32), reducing the numbers of low income earners in this age group.

Other advantages of a comprehensive approach to housing rather than an age-restrictive approach is that housing is then less restrictive and more marketable to accommodate an age mix of residents in an area, that could change over the life of the dwelling. Owners of housing have a wider audience to rent or sell their dwelling to, maximizing their returns. They are also able to pass the dwelling on to be used by their children or other younger relatives.

Finally, the traditional ages of changing or renovating property at retirement and the 'empty-nester' stage of life, are being affected by the earlier retirement of men from full-time work (ABS, 1997, p4) part-time work after retirement (ABS, 1997, p29; NSW Department of Planning, 2002, p34), and a higher rate of children in their twenties remaining in, or returning to the family home (ABS, 2000b). While it may be effective to target people in this retirement/empty-nester stage of the lifecycle in the short term, these factors result in a very broad age range of people to focus on.

The implementation of Universal Design

In *Universal Design in Housing*, Mace suggests that Universal Design probably cannot be mandated (1998). If Universal Design is market led, it could be argued that perhaps it should not and does not need to be, applied through regulations. Perhaps if the future inhabitants of housing had the responsibility of designing their homes, the marketability of Universal Design would be sufficient to ensure its adoption. Few people, cost permitting, would turn down these features of design, because unlike Accessible Design which is focused on the needs of people with disabilities, and Adaptable Design, where the benefits might not be immediately apparent, Universal Design, by definition has value to all users. If the degree of consumer 'pull' for Universal Design is sufficient, perhaps housing developers will take note. The current demand for housing features such as indoor-outdoor entertaining areas and prestige European brands of stainless-steel kitchen appliances in Australian housing, is an indication of the strength of the consumer pull in housing design features.

However, there will always be housing that has little market value, due to poor design, unpopular location or cheap construction - the housing where the focus on cost prevented a better housing solution. This negative market perception will affect the selling price of this housing, leaving it for those lower income people with limited housing funds. Building codes protect these people, ensuring that housing is designed and built to an acceptable standard. So some features of Universal Design, including features for accessibility, may need to be regulated through building codes.

The danger of regulations or guidelines for Universal Design is that the guidelines or minimum standards can be interpreted as maximum standards or literally as acceptance criteria. This inhibits progress and stifles design creativity. The guideline "a place to put packages while opening doors: built in shelf, bench, or table with knee space below located on the outside next to the door" (Mace, 1998) could be interpreted as a prescriptive

requirement for "a parcel shelf adjacent to the front door". One up-market housing development in Sydney, features access to main entries through recognition of a security pass that is within 60cm of the entry door, eliminating the need to use (and rummage for) a key, remote control or swipe card (Meriton, 2003b). This Universal Design feature is far more convenient and universal than a parcel shelf, and is marketed to the general community.

Universal Design for Australian housing would be better outlined as performance criteria, to maximize designer creativity, with compulsory minimum acceptance criteria. It is perhaps up to innovative architects to lead the way with Universal Design in prestige housing developments. Their contributions at the top end of the market could initiate a 'trickle down' market demand for these features. As Universally Designed housing is comprised not only of the physical spaces, but also the products and controls within the space (Connell & Sanford, 1997, p119), the success of Universal Design in housing is also dependent on industrial designers taking a Universal Design approach to products for the home.

Implications of no regulations for access

In the absence of regulations for housing accessibility, people with disabilities who lack access to housing can only take their case to the HREOC in a claim of discrimination. However, the Australian Disability Discrimination Act (DDA, 1992) is focused on buildings with public access, rather than private residential dwellings. The problems of relying on the DDA for provision of suitable housing for people with disabilities are threefold. Firstly, the absence of regulations mean that all stakeholders have to rely on the results of prior cases under the DDA for the application of the DDA to housing, making a clear understanding of guidelines difficult. Secondly, a person with a disability who is excluded by lack of access from purchasing a dwelling in a new housing development would have no case under the DDA (HREOC, 2000b). They either have to select their housing from a very limited range that is already accessible or meet the expense of adapting a non-accessible dwelling. Thirdly,

although a renting tenant with a disability has the right to (assuming they had access to the considerable funds that it would require) modify their own premises and potentially install accessibility features such as ramps, rails and wider doorways on the common property in a strata development, design could well be compromised due to cost, with fixtures being temporary in nature and appearance. These fixtures could have a considerable effect on the aesthetics of common property and ultimately rental and resale value of other properties in the development.

Addressing accessibility in the design of private housing will eliminate the need to rely on the DDA and provide more suitable housing for the population with disabilities. Using Universal Design to provide that accessibility can provide housing and common areas of housing developments that are accessible to people with disabilities and are aesthetically and functionally acceptable to everyone.

Universal Design providing a home

Housing is just one (very important) component of what is meant by "home". Whereas Universal Design is concerned with the physical aspects of housing environment, home involves the relationship between the occupant and that housing environment (Dovey, 1985, p33).

True Universally Designed housing, with all spaces, external grounds, fittings and appliances usable and marketable to the majority of users is not an end in itself and is not necessarily the 'answer' for home design for the older population. A low-maintenance courtyard with raised planting beds might enable independent care of the garden. This could be sufficient to eliminate the need for "property maintenance" home-based care, which represents the highest demand and provision for home-based care by people with a disability in Australia (ABS, 1998, p25). However, this type of home-based care is not purely a garden

or cleaning service, it also provides social contact that could be addressing feelings of loneliness, depression or insecurity in some older people.

Researchers have found that a suitable physical environment is one of the most important features of 'home' (Smith, 1994). Other essential features have included good social relationships within and outside the home, a positive psychological environment, personal freedom and privacy, the ability for personal expression, especially through personalization of the environment, security and safety. Continuity and security of tenure are also important (Smith, 1994).

Fortunately, many new medium- and high-density housing developments in Australia can address some of these 'home' needs of older people (along with the rest of the population), and can be an effective alternative to age-specific accommodation. They provide a private dwelling and control over the dwelling interior, yet are closely linked to a community. They are located close to transport and local facilities, with secure onsite swimming pools, gymnasiums, outdoor areas and parking. Security is further enhanced with video intercom and an onsite caretaker (Australand, 2002; Meriton, 2003a, 2003b; Mirvac, 2003a, 2003b; Stockland, 2003a, 2003b). The addition of a Universal Design focus on the physical environment of these non-age specific housing developments could provide one viable housing alternative for older people, and benefit people of all levels of ability in all age groups.

Rather than an end in itself, Universal Design is a means for a suitable physical environment for home for the aging population. It can assist with security and safety (both for the occupier and if required, carers), allow personal freedom and privacy by maximizing independence, and provide continuity through provision to age in place.

Conclusion

Universal Design may well provide part of the answer for home design for the aging population. By addressing the physical aspects of the home, it can assist people to have more control over their housing for their future years.

Rather than focusing a Universal Design approach on housing for aging baby boomers, or the current older population, it would be more suitable to apply it to the design of dwellings for all age groups. Universal Design is intended to be useable by, and useful to, people of all ages and abilities. It requires no age restriction in the selection or duration of occupancy of housing. It can potentially eliminate the need to adapt a dwelling to provide access to people experiencing a temporary or permanent disability, irrespective of their age. As such, it has a benefit to the entire population.

As Universal Design will not be able to cater to every person's needs, a method of specifying the sensory, physical and cognitive ability levels of people for which housing has been designed, and linking this with information on required tasks and body movement for specific domestic environments, limitations, existing relevant products and important design considerations, would possibly help to identify when additional adaptation will be necessary. Providing such linkable information related to the various spaces of a domestic environment and the ability levels of people of different ages and standards of health, rather than just disability statistics, will assist designers and specifiers to design and develop housing that is useful and usable for the largest population. Incorporating adaptive customization into housing features and products can address situations where housing occupants have conflicting requirements or their requirements change over time.

Some aspects of Universal Design may need to be regulated to ensure sufficient access to housing at the lower end of the market and safety is not compromised. However, the

immediate benefits of Universal Design suggest that the incorporation of Universal Design in housing should be driven by market appeal and will be reinforced by housing value.

Universal Design in housing is not solely the domain of architects and building developers. The potential for housing designers to provide housing with universal access is dependent on the availability of suitable products for housing interiors and a suitable external environment. The opportunity for Universal Design lies with all designers and specifiers in the housing field. Their innovations at the top end of the housing design market will have an influence on the direction of housing design.

For Australia, the next step forward is possibly further research to evaluate the various design policies and standards currently in place. Queensland's Smart Housing policy illustrates that Universal Design is not an end in itself; it is an integral part of a strategy for well-designed, sustainable housing. Empirical studies of the economic, housing access and health benefits of Universally Designed housing for people at various levels of ability, stages of lifecycle and housing career, and a comparison with international housing models, are required.

Finally, further education of the benefits of Universal Design is necessary for the general public. Whereas many previous attempts to publicize aspects of Universal Design have focused on disability access and planning for disability for older age groups, an emphasis on the benefits of Universal Design for every stage of the lifecycle could well provide a distinction from some of the negative perception of regulatory Accessible Design. The general housing market needs to be aware of Universal Design benefits if it is to reach its full market potential.

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