Changing demographics, disability access and the use of performance-based design

Paper presented by Garry Fielding, Department of Infrastructure, Planning and Natural Resources, New South Wales, Australia, to the Global Policy Summit on the Role of Performance-Based Building Regulations in Addressing Societal Expectations, International Policy, and Local Needs

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As indicated by the Session Chair in his introduction, an important part of my position as Director with the Department of Infrastructure, Planning and Natural Resources is the role of Chairman of the Australian Building Codes Board's Building Access Policy Committee. The Committee's main objective is to help industry, regulators and service providers achieve equitable, cost-effective access to buildings and to the facilities and services in buildings for people with disabilities.

Today I would like to talk about demographic change and the way in which an ageing population could affect the way we need to regulate the design and construction of buildings. I also want to discuss the topic of access for people with disabilities to buildings and how this relates to an ageing population. And, lastly, I will take you through the use of performance-based design and whether it does have a role to play with the codification of civil rights legislation. Much of my presentation today will rely on statistics and other data derived from Australian conditions, but I believe these can be broadly applied to any country, especially those embracing performance-based building regulation.

Let's start with some demographic background. Australia currently has a population of approximately 20 million people. This is projected to increase to between 24.1 and 28.2 million by 2051.[1] Previous population projections suggested that 290,000 people would be 85 years of age or older by the year 2051 but revised figures now suggest there will be more than 1.6 million people in this age bracket by the year 2051[1]. In other words, it is expected that the proportion of Australia's population aged 85 or older will increase almost five-fold, from a little over 1% in 1999 to around 5% in 2051. At the same time, the proportion of Australia's population aged 65 years and over is expected to increase from 12% in 1999 to between 24% and 27% in 2051. Of course, this is not a situation unique to Australia.

So what does all this mean? Some of us would say that it means there is five times the probability you and I will be back here at an IRCC conference in 2051! But, more significantly, it means that regulators should be seriously considering how an ageing population will affect the way in which buildings are designed and regulated in the future. To begin with, there is much to be considered if we are to design our future building stock to meet the needs of an ageing population. I will provide my views on the ways in which buildings should be designed in future later in my paper.

If a much larger proportion of the population is expected to be over the age of 65 in less than 50 years' time, then shouldn't we be considering the production of building stock now and ensuring that all new construction is designed and built to meet the needs of an aged population? By way of example, should the option of stairs at entrances to buildings be removed and replaced by the provision of ramps? Should all toilets and showers in publicly accessed buildings be constructed with handrails for support?

In contrast to the increasing number of people over the age of 65 in the Australian community, the proportion of the population between the ages of 15-65 is expected to fall, from 67.1% in 1999 to 59.6% by 2051.[2]

All of these significant demographic changes can be directly linked to changes in fertility rates. Since the fertility rate peak in Australia in the 1960's and during what we call the post World War II 'baby boom', when there were on average 3.5 births per woman, fertility rates have steadily fallen.[1] And, interestingly enough, since the mid 1970's, the fertility rates have been below what is required to replace the population. One of the key influences on the change in fertility rates is the fact that couples are now

[1] Commonwealth of Australia, Australia's Long-Term Demographic and Economic Prospects, Intergenerational Report, Budget Paper No 5 2002-2003, 2002
[2] Australian Bureau of Statistics, Population Projections, 1999 to 2101

deciding to have children later in life. This results in less time being devoted to the raising of families and hence fewer births.

By the year 2042 the fertility rate in Australia is projected to fall from its current 1.75 births per woman to around 1.6 which, while not meeting population replacement targets, is actually higher than many other OECD countries. These countries include Italy, Japan and Sweden. While Australia's current fertility rate is higher than the OECD average, it is lower than both New Zealand's and that of the United States. The United States' fertility rate is 2.13 births per woman.[2]

The life expectancy of Australians is among the highest of OECD countries. In the past 40 years, the life expectancy of Australians has risen by 8.3 years for men and 7.6 years for women. [2]

The demographic data I have presented here suggests that the average age of the population in Australia is increasing, and this is indeed so. In fact, the 1999 median age of 34.9 years is projected to be between 43.6 and 46.5 years by 2051.[2]

We are also becoming one of the fattest populations, with a consequential effect on mobility. Experts predict that by the year 2025, as many as 30% to 40% of the Australian population could be obese. Obesity significantly increases the risk of arthritis and reduces mobility. In most cases obesity is a preventable condition. So how much money should be spent on healthy lifestyle promotion rather than the adaptation of buildings?[3]

The question that naturally follows from all these demographic data I've presented to you is this: will these changes in the demographic composition of Australia have an effect on the regulation of building design?

Around the world and particularly in Australia, Japan, the United States and the United Kingdom, there is much work being undertaken on the development of building regulation to address the rights of people with a disability. Much of the work is being focused on access to public buildings but the emphasis is slowly moving to both visitable and adaptable housing for people with disabilities. In Australia, we have recently amended our building code to introduce a new classification of building which specifically accommodates the needs of the aged and embraces a concept known as *ageing in place*. Effectively, this allows a person through the various stages of ageing and through their needs for high and low levels of care to remain in the one facility. These requirements only apply to a particular class of building and, hence, only go part of the way in regulating building design for an ageing population.

So, is there a need to regulate building design for an ageing population when we are currently regulating building design to suit the needs of people with a disability or are the needs of both groups effectively the same? Before we try to answer this question I would like to consider how the needs of people with a disability are currently being dealt with, particularly in relation to civil rights legislation.

In Australia we are currently going through a process to amend our national Building Code to align it with Australian disability rights legislation. This legislation makes it unlawful to discriminate against a person or an associate on the grounds of a disability. This process is being undertaken with input from all stakeholders including industry, the disability sector and all levels of government. A significant consideration in this process has been the use of performance-based building regulation. As Australia's Building Code is performance-based, the revised regulation that will apply to the design and construction of buildings for people with disabilities will also be performance-based.

Deemed-to-satisfy provisions have also been developed and some groups believe that compliance with the deemed-to-satisfy provisions is the only way in which someone can be sure that they have met their obligations under the civil rights legislation. The reason for this approach is that the development of the deemed-to-satisfy provisions have been rigorously debated and negotiated by all stakeholders including government to ensure that they meet the intent and objects of the civil rights legislation and the needs of people with disabilities.

In considering the rigor and level of debate with which the deemed-to-satisfy provisions were developed, is it reasonable to suggest that a performance-based design that has not been subjected to the same level of rigor should not be considered to have met the intent and objectives of the civil rights legislation? Is someone who uses a performance-based design leaving themselves open to a breach of the civil rights legislation?

By way of example, all stakeholders have agreed that a ramp for use by a person in a wheelchair should be limited to a maximum gradient and, by doing this, have agreed to the deemed-to-satisfy provisions or, in other terms, the minimum acceptable standard to satisfy civil rights legislation. Conversely, and by way of example, a building could be designed with a state of the art power-assisted ramp which has a steeper

[3] Medical Journal of Australia 179(9):427, Overweight and Obesity in Australia, 2003

gradient than contained in the deemed-to-satisfy provisions. This could be justified and approved through the use of expert judgement and performance-based design. However, is it possible for such a performance-based design to meet the requirements of civil rights legislation when the performance-based solution is different to that required by the deemed-to-satisfy? There are many opinions, especially those of stakeholders involved in the development of the deemed-to-satisfy provisions who do not believe that performance-based design can consistently satisfy civil rights legislation.

Alternatively, if we do agree that the use of performance-based design can be adequate to meet the intent of civil rights legislation, then the need for deemed-to-satisfy provisions may be questionable, particularly considering the time and money spent on their development.

I would now like to come back to my question of whether a built environment designed for people with a disability can also provide for the needs of an ageing population.

Although on occasions it has been demonstrated that it can, an environment designed for people with disabilities can also be hazardous for a person who is aged. For example, a common point of discussion relevant to safety is the provision of tactile ground surface indicators. Tactile ground surface indicators, or TGSI's as they are more commonly referred to, are raised domes that are provided in a grid-like pattern and fixed to the ground surface in strategic locations. The purpose of TGSI's is to warn a person with vision impairment that they are approaching a hazard. These hazards include a stairway, ramp or overhead obstruction.

As TGSI's have a raised dome section they can be the cause of trips and falls for people, particularly the aged. Therefore, in this particular instance, the provision of a surface that assists a person with a disability may provide a hazard for someone who is aged. Another example is that ramps provided for people with disabilities are not always the most appropriate form of access for someone who is aged. This can be related to two distinct issues, the first being that the distance of travel along a ramp as opposed to stairways into a building is usually longer and, secondly, stairways are more easily used by a person with limited hip mobility, a condition often related to aged persons. These are examples of where the built environment assists people with disabilities and in some cases only specific disabilities, but which may not assist the aged.

Some of you may be thinking that a slip or a fall in a building is not a serious life safety issue. In an article from the September BIA News, is a magazine produced by the New Zealand Building Industry Authority, the incidence of slips, trips and falls was covered in detail. In New Zealand, a country of approximately 4 million people, falls were the major cause of hospitalisation due to injury and far exceeded those related to motor vehicle use. It may also surprise you to learn that there are more than 200 fatalities associated with falls every year in New Zealand. This figure is on the rise as in 1978 falls accounted for 28% of hospitalisation and in 1998 the figure was an astonishing 39%.[4] In the United States, one third of adults over the aged of 65 experience falls each year and 10,000 die from fall-related injuries.[5]

Research into Health and Safety Risks in Buildings commissioned by the Australian Building Codes Board identified that in the year 1999-2000 there were 12,000 workers' compensation claims relating to the indoor environment and approximately 8,000 (or 66%) of those claims were for slips, trips and falls and nearly 3,000 for incidents that occurred at steps and stairways.[6] Unfortunately, the collection of these data did not indicate the contribution of particular building factors such as design, surface conditions, hazards or the alertness of people. Therefore, can we assume that the incidence of slips, trips and falls will rise further with an ageing population and should further research be undertaken to determine the attributable hazards?

If the needs of the aged are different from those with a disability, then why isn't a significant amount of work being done to address the needs of an ageing population? Also, considering the advances in technology, the availability of health services and the ever-increasing prevention of birth defects, it could be expected that the percentage of the population with a disability could diminish over the next 50 years. Therefore, is too much emphasis being placed on accessibility to the built environment for people with disabilities rather than for the ageing population?

It is true that more people are living longer and unfortunately getting fatter but are their needs in buildings changing? It is hard to say but at the moment I believe the answer is no, their needs are not changing, and until there is evidence to support the need for more regulation I don't believe we need to consider this change in demographics. The issue in relation to the use of performance-based regulation and civil rights legislation is something that does need further consideration. In Australia we will not know if performance-based regulation and civil rights legislation are compatible until our new changes take effect and the system is tested. However, there is no doubt in my mind that the ability of performance-based

[4] CS Wright, JD Langely, DM Allnatt, Slip resistance of walking surfaces, BIA News September 2003
[5] National Centre for Prevention and Control (USA), Falls and Hip Fractures Among Older Adults, Fact sheet, 2003
[6] Australian Building Codes Board, Health and Safety Risks in Buildings, August 2003 (unpublished)

building solutions to consistently satisfy the objectives of civil rights legislation will be well and truly tested during this time.

In relation to the ability of building regulation to suit the different needs of the community, that is, the aged and those with disabilities, it can only be a matter of wait and see to determine what the future may hold. We can only continue to be pro-active to the needs of the community and respond to the issues as they arise. Historically, this has always been the way in which regulation has been developed and no doubt this approach will continue into the future. I understand that the Australian Building Codes Board is currently undertaking a study to determine the risk contribution buildings make to slips, trips and falls. This research is in direct response to the increased number of injuries and fatalities from these incidents and the needs of the community generally.

In Australia and probably many other countries, the need to regulate only becomes apparent after an event or as a response to an identifiable and immediate problem. This mindset mitigates against truly proactive regulation to address perceived future needs.
