

# **RETHINKING HOUSING SOLUTIONS: ADAPTIVE REDESIGN APPROACHES FOR AGEING APARTMENT BUILDINGS**

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## **INTRODUCTION**

A raft of challenges face multi-unit residential housing design, at the forefront of which is a triad of interrelated needs – to make dwellings more economically, socially and environmentally sustainable.

To date, this discussion has primarily focused on the provision of high quality new housing designs. In comparison, the renovation of the significant existing housing stock dating from the post-war period is rarely seen as a viable option. Often seen as a failure and technically outmoded, demolition and rebuilding is often seen as the most viable option. Contributing to the choice of rebuilding over renovation are the difficulties associated with multiple ownership, which complicate decision-making processes.

However, the existing housing stock offers rich opportunities for creating more liveable, affordable, and environmentally-friendly solutions, which remain largely underexplored in Australia. In this paper we explore the opportunities of what we term “adaptive redesign” of existing multiple-owned housing. By this, we mean an approach that is based on customised solutions that fundamentally rethink the design starting from the needs of current inhabitants and the opportunities of the building ‘as is’, rather than a mere renewal of its existing building fabric and the updating of its external appearance. The paper draws on a broad church of research, and argues that by thinking creatively it is possible to make advances that create productive links between environmental, social and economic factors. In so doing, the large amount of existing housing stock can be adapted to be more environmentally, socially and economically sustainable, providing immediate solutions for the present and impacting on the lives of urban dwellers. What is needed is a meta-framework for “adaptive redesign” approaches that draws on successful precedence in Australia and in comparable countries and facilitates the transition from disparate examples to a mainstream housing solution that influences policy.

## **Apartment ownership in Sydney**

Sydney is the most populous city in Australia. It also has the largest number of flats, units and apartments (henceforth ‘apartments’) of any Australian Capital City. Approximately one-quarter of all dwellings in the Greater Sydney Statistical Area are apartments.<sup>1</sup>

In Australia, most privately owned apartments are owned as strata titled properties. Government and community housing providers own some entire apartment blocks, but their numbers are small, reflecting the small size of the social housing sector in Australia.<sup>2</sup> There are also a limited number of privately owned apartment blocks rented to tenants by private landlords, but again this market is small

and Australia does not have a highly developed institutional rental investor market like those that exist in cities internationally.<sup>3</sup> The result is that if a person lives in or owns a private apartment in Australia then the likelihood is that it is a strata titled property. Some other building types can also be owned under strata title including townhouses and villas.

Greater Sydney has the largest number of residential strata properties of any Australian city with over half a million (535,427) dwellings (lots) across 35,619 developments (strata schemes) as of December 2013.<sup>4</sup> Approximately one-third of these developments (33.1% of all schemes and 31.7% of all lots) were registered before 1980 and of those older schemes, the majority (82.2%) consist of 20 dwellings or less. These figures demonstrate that there are a large number of older apartment buildings in Sydney that make up a significant part of the city's housing stock. They are generally smaller developments (under 20 units) and are spread across the metropolitan area, but especially clustered along the major train lines (see Figure 1).

### Changing resident profiles and ageing buildings

The question that arises is whether these older apartments continue to meet the needs of their residents. The answer to this question relies on the answer to two further questions – who is living in them and how well have they been maintained? In responding to the first question, research undertaken in Australia by Randolph and Tice has demonstrated that over time the resident profile of suburbs, and the apartment buildings within them, can change significantly so that the people who live in these apartment 10 or 20 years after they are built may be quite different to the occupants envisaged by architects, developers and planners when the buildings were first constructed.<sup>5</sup> For example, Easthope and Tice demonstrate how in one Sydney suburb the resident profile of a new development made up of multiple apartment buildings changed rapidly to include increasing numbers of households with children and lower income households within just a few years.<sup>6</sup> Indeed, as Randolph and Tice explain, in older suburbs “considerable restructuring of the local housing markets is likely to have taken place over time” with “changing demand segments leading to up- or down-grading”.<sup>7</sup> The result is that the people living in older apartments may very well not be the types of people envisaged to live in them when they were designed and built, and beyond that the demographic profiles of cities have also diversified as a result of increasing immigration and ageing of the population, which is likely to have led to a diversification of needs, or even conflicting needs. Add to that changing demands on space over time as home technologies, living practices and aspirations continually evolve, and one would expect older apartment buildings may no longer meet the needs of their current residents.

The changing demographic profiles of residents observed by Easthope and Tice are a common occurrence in Europe as well. In fact, a recent housing project in the residential neighbourhood area of Ommoord in Rotterdam/Netherlands cited changes in resident profile as a main motivation for redesign.<sup>8</sup> The Ommoord apartment blocks were constructed in the 1960s, and in 1999, the housing association commissioned big architects to upgrade the buildings' technical performance and find an architectural solution to improve the increasingly tense relationships between different resident groups. In particular, younger families from varied socio- economic and ethnic backgrounds and older residents who had lived in Ommoord from the beginning presented conflicting needs and ignorance of respective social codes.<sup>9</sup> The architects noted that:

*“The departure of the stable population of pioneers and the influx of new tenants with different skin colours might be a completely normal manifestation of urbanisation, but for older residents it is a threat to their ways – new families parking their children's bicycles on the access gallery is their worst nightmare.”<sup>10</sup>*

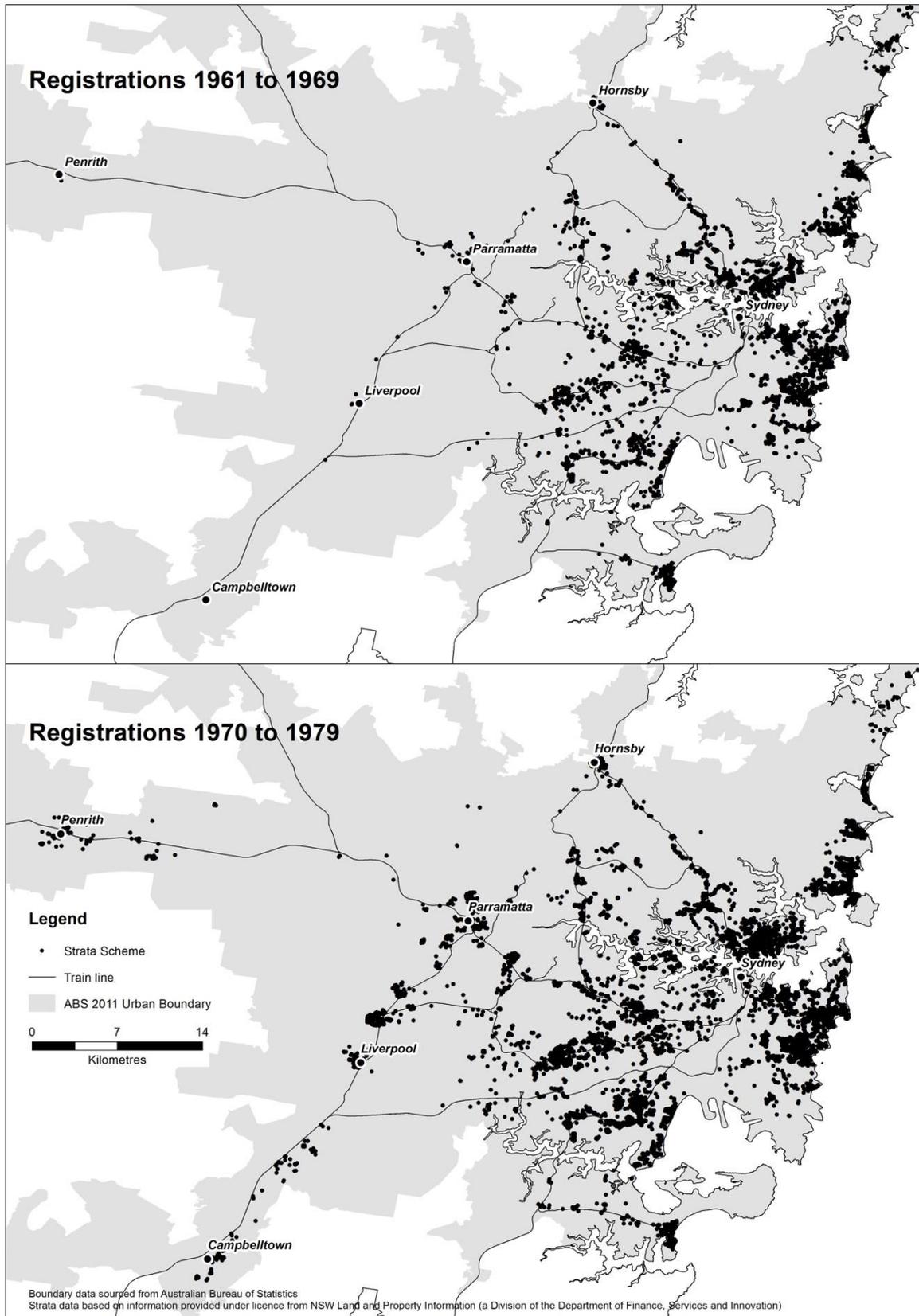


Figure 1. Location of Strata Schemes by Registration Date. Image from: Laurence Troy et al., *Renewing the Compact City: Interim report* (Sydney: City Futures Research Centre, 2015), 13.

Negotiating the customised redesign of the buildings to the needs of present residents represented a significant part of the architects' charge and resulted in a time-consuming nine-year process. By rethinking the spatial organisation of the scheme together with the residents, the final scheme proposed a redistribution and sectionalisation of apartments according to social groups, and more specifically, the inclusion of aged care facilities and the reservation of two blocks for older residents.

Changes to the demographic profile of residents and habitation patterns can be attributed to various causes. In Australia, increasing immigration rates of disproportionately young adults substantially add to demand for housing and lead to changes in demographic resident profiles.<sup>11</sup> Predictions highlight that beyond 2040, as much as 80 per cent of population growth could be attributed to overseas migration, and in Sydney, this figure could reach 100%.<sup>12</sup> The ageing of long-term residents, as witnessed in Ommoord, equally represents a significant issue in Australia. In fact, immigration and the ageing of resident households are the two important aspects that shape resident profiles in Sydney and Melbourne, as recent demographic studies by the Australian Population Research Institute show.<sup>13</sup> But there is a plethora of secondary causes, too: a recent AHURI report, for example, cites evidence of alternative habitation formats such as shared housing, or children returning to live with their families in response to tightening rental markets, as additional factors contributing to changing forms of habitation and resident profiles.<sup>14</sup>

### **Obstacles and opportunities: Redesigning residential properties under multiple ownership**

In responding to the question of ageing buildings, research undertaken in Australia<sup>15</sup> and overseas<sup>16</sup> has highlighted the difficulties of maintaining and upgrading apartment buildings under multiple ownership, such as strata titled apartment buildings. For example, Easthope, Randolph and Judd found that disagreements relating to major expenditures, including major repairs, were quite common in strata schemes in New South Wales. They note:

*“A particular issue regarding decision-making in strata schemes ... is the length of time it can take to make a decision and take action on particular issues because of the difficulties that can be experienced in getting consensus within the executive committee or between owners.”<sup>17</sup>*

These challenges of ageing and inadequately maintained apartment buildings have been recognised by government and industry in the Sydney context and formed part of the NSW government's justification for changing the legislation regarding the proportion of owners who must agree to terminate a strata scheme as the first stage towards knocking down and rebuilding apartment buildings.<sup>18</sup> However, demolishing and rebuilding apartment buildings is both an expensive, and potentially very disruptive, exercise.<sup>19</sup>

In those cases where apartment buildings have been redesigned, traditionally, efforts have focused on fixing pressing technical issues relating to the building fabric and updating the external appearance to a more contemporary design. This is a very reductive approach and often does not involve architectural services. Adaptive redesign of buildings rather than simple renovations is likely to offer more viable alternatives towards achieving the goals of improved social and environmental sustainability. As was noted in a 2015 roundtable discussion hosted by the Journal of the Royal Institute of British Architects:

*“In large-scale housing retrofit, clients generally regard the work as a mere technical fix that does not require an architect. In doing so, they potentially miss*

*out on considerable value-adding opportunities that arise from the wider design vision that architects offer.”<sup>20</sup>*

A milestone in the adaptive redesign of older apartment buildings is the acclaimed transformation of the 1960s apartment block *La Tour Bois le Prêtre* in Paris by architects Druot, Lacaton & Vassal in 2011.<sup>21</sup> The 16-storey tower with 96 apartments underwent adaptive redesign using environmentally sustainable strategies such as minimizing new building works, the intelligent use of materials, and performative upgrading to minimise operational costs such as heating and electricity, amongst others. The use of prefabricated elements permitted the residents to continue inhabiting the building during the construction phase, and thus avoided the considerable financial burden of rehousing them in other locations for the duration of the works. The use of prefabrication and off-the shelf materials also minimised construction cost and time, causing only minor disruption to residents: the addition of balconies and winter gardens, for example, had an installation time of one day per apartment.<sup>22</sup>

The architects demonstrated that the cost of adaptive redesign can be less than half the cost of demolition and rebuilding: The project cost came to 15 Million Euros instead of the 26 Million Euros initially envisaged for a new building.<sup>23</sup> But in addition to construction costs, the environmental savings were significant given that the built environment accounts for around 30% of global annual GHG (green house gas) emissions and consumes up to 40% of all energy.<sup>24</sup> The energy consumption and GHG emissions of a building can be divided into three phases of the whole-building-life-cycle: construction, use, and demolition. In most building projects, the use phase by far exceeds the other phases with 80% of green house gas emissions occurring in this phase, compared to 10-20% produced for construction, maintenance and demolition.<sup>25</sup> Technical upgrades to reduce energy usage and emissions during the use phase of buildings, which are the result of heating, cooling, ventilation, lighting, and other applications, is an effective environmental performance measure that equally contributes to cost savings for inhabitants.

In *La Tour Bois le Prêtre*, social sustainability was of equal importance to environmental and technical factors. Indeed, for the architects, it acted as the main driver of the project. By developing customized measures in close collaboration with the residents and looking at the adaptive potential of the building, the architects deployed a case study approach that built upon the particulars of the project scenario. The residents’ needs ‘co-determined’ the adaptations of the individual apartments to provide simple comforts such as more space, light, views and social contact. Main improvements included: extending habitable spaces through the addition of balcony spaces and winter gardens; providing generous views through the replacement of small windows with full-width glazing (the architects found that “the building’s windows were tiny, so [that] even the units on the upper levels of the building had no real view of Paris”)<sup>26</sup>; and rethinking communal areas to facilitate collective activities. Anne Lacaton explains that this approach is distinct from traditional renovation approaches, which reinstate rather than rethink and often focus on external appearance. She insists that in *La Tour Bois le Prêtre*, the design and aesthetics arose from decisions about the quality of the spaces: “We could have done something playful and fashionable on the outside, to look better, if we had put just a few balconies here and there. But our priority was improving the living conditions for everyone.”<sup>27</sup> Conceived to improve the life experiences of inhabitants, the redesign represented a socially viable alternative to conventional renovation approaches, allowing residents to articulate their individual needs and appreciating the opportunities afforded by the specific housing design.

### **Adaptive Redesign Approaches: Methods, Opportunities and Limitations**

If owners and residents of apartment buildings are to assume a more central role in the design process, there is evidently a need to provide guidance to assist with the decision-making, but more

generally a clarification of responsibilities and collaborative processes. However, few details are known about the methodological approaches and design processes used by Lacaton & Vassal, biq or other architects involved in participatory design projects. User consultation and working with the givens of the existing building constitute an integral part of these approaches, as does a shared interest in ethics over aesthetics. Lacaton & Vassal, for example, have frequently cited an architectural interest in "making do with what you have, working with the inherent qualities of the space or site," and being "attentive to the situation you have in front of you" - architectural tactics which show little interest in designing an object with a particular style or using established design methods.<sup>28</sup> Yet in the absence of a clearly articulated methodological framework and the lack of evidence-based approaches, obvious problems come to the fore: **First**, if residents participate in the design process, how are design decisions made and who makes them? The responsibilities, duties, and liabilities of the architect as a professional are tightly regulated by the Architects Registration Boards in Australia and the UK, and by similar bodies in other countries, who do not make allowances for alternative processes. What then happens when residents and unit owners make design decisions, which they are not professionally qualified and not best suited to make? Professionals now find themselves in the role of co-producers whilst not being relieved from the professional obligations under which they find themselves from professional and legal bodies.

**Second**, what are the implications for the professional self-image of the architect if others now participate in his role and what are the skills that he needs to acquire to assume a meaningful role in the participatory process? In his discussion of participatory processes, architect Markus Miessen has proposed the model of the "cross-bencher" as a creative intervener, someone who belongs to no party, and stimulates argument and debate rather than consensus.<sup>29</sup> This line of thought, whereby the architect is no longer necessarily someone who designs buildings, but more generally a creative producer or auteur also aligns with art-inspired participatory practices proposed, for example, by practices such as muf, who do not see buildings as the only architectural outcome but also include the making of relationships, the forging of dialogues and the staging of temporary interventions.<sup>30</sup> However, architectural education and CPD (Continual Professional Development) subjects rarely include training in "good people skills" such as teamwork, collaboration, cooperation, communication, respect, empathy and so on, and these are hard to define and difficult to acquire. Yet they are pivotal to the success of participatory projects: to the building of mutual trust and the negotiation of tensions that inevitably occur, even though, as Donald Farquharson, head of capital programme delivery for Kent County Council, bluntly points out: "in my experience working together is not a concept architects enjoy."<sup>31</sup>

**Third**, how can residents and unit owners be appropriately up-skilled to participate in these processes without losing their autonomy and creativity? Some forms of Co-Housing can provide important insights on the challenges and opportunities entailed in the collective engagement of architects and residents in the design process, although most multiple-owned housing schemes do not form "intentional communities" in the sense of Co-Housing projects.<sup>32</sup> In a recent series of seminars, for example, the UK Cohousing Network seeks to tackle issues associated with knowledge transfer, particularly with respect to what they term "the professionalization of the collaborative process between communities and expert partners."<sup>33</sup> Expert partners would include architects who traditionally assume the role of the consultant team leaders. Asking whether "collaboration between groups and professionals" can "take place without undermining grassroots autonomy and creativity", the network points to the fact that client bodies see the involvement of professionals as a threat to their independence and participatory aspirations.

### **Adaptive Redesign Approaches: Concluding Thoughts**

The Paris and Rotterdam housing schemes discussed in this paper can be seen as pilot projects, trialling approaches to adaptive redesign based on user participation. It is important to note that in these projects, the standard design processes used for architectural projects are no longer applicable. In both Rotterdam and Paris, the design consultation phase was ongoing and extensive, whereas the construction

phase was comparatively condensed due to processes such as prefab and strategies of minimising new built interventions. While these case studies are exemplary in terms of their outcomes, they also suggest the need for improved guidance to streamline the participatory design approach. In Ommoord, for example, the entire project involving 2000 residents extended for nine years (1999-2009), of which the construction phase only took up 2 years (2007-2009).

It is evident that standard design processes for architectural projects do not effectively meet the needs of residents in existing properties nor of architectural professionals attempting to provide services for them. What is needed is a new design process for adaptive redesign that increases the efficiency of what to date have been case-by-case approaches and enables participatory design approaches to become a mainstream design approach. Where adaptive redesign has been employed, the design approaches have not been comprehensively recorded or disseminated and therefore there is a need for knowledge transfer. This would include: a) collecting the information that exists about what has been done internationally and b) collecting new information through case studies. Building on the knowledge now available from these and other case studies, it should be feasible to develop a framework to support this type of participatory design process, thus opening up new solutions for multi-unit residential housing.

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  - <sup>4</sup> Laurence Troy et al., *Renewing the Compact City: Interim Report* (Sydney: City Futures Research Centre, 2015), 1.
  - <sup>5</sup> Bill Randolph and Andrew Tice, "Who Lives in Higher Density Housing? A study of spatially discontinuous housing sub-markets in Sydney and Melbourne," *Urban Studies* 50, no. 13 (2013): 2661-2681.
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  - <sup>7</sup> Randolph and Tice, "Who Lives in Higher Density Housing?," 2664.
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  - <sup>9</sup> James McLachlan, ed., *Exemplary Housing Estate Regeneration in Europe* (London: EMAP, 2015), 34-35. The reference to the variety of socio-economic and ethnic backgrounds evident in Ommoord's resident profile is repeated by Hans van der Heijden, the former design director at biq architects at the time. See van der Heijden's website, accessed March 15, 2016, <http://hvdha.com/splayed-apartment-blocks/>
  - <sup>10</sup> Cited in Woodman, "Post-war estate regeneration."
  - <sup>11</sup> A 2008 report cites immigration as a major factor in population growth. See *Senate Select Committee on Housing Affordability in Australia*, report tabled on June 16, 2008. In particular, Chapter 4: Factors influencing the demand for housing, Subsections 4.4 - 4.13: Demographics, accessed February 12, 2016, [http://www.aph.gov.au/Parliamentary\\_Business/Committees/Senate/Former\\_Committees/hsaf/report/c04](http://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Former_Committees/hsaf/report/c04)
  - <sup>12</sup> Bob Birrell, *Committee Hansard* (24 April 2008), 31. Cited in *Senate Select Committee on Housing Affordability in Australia*, report tabled on June 16, 2008 Chapter 4, Subsection 4.7.

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<sup>18</sup> Laurence Troy et al., *Renewing the Compact City: Economically viable and socially sustainable approaches to urban redevelopment, Final Report* (Sydney: City Futures Research Centre, 2015).

<sup>19</sup> Ibid.

<sup>20</sup> Unknown author, "Keep the faith", *RIBA Journal* (1 September 2015), accessed February 26, 2015, <https://www.ribaj.com/intelligence/championing-the-vision>

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