



Living well in greater density

**Hazel Easthope
and Sarah Judd**

June 2010

Living well in greater density

By Hazel Easthope and Sarah Judd

City Futures Research Centre
Faculty of the Built Environment
University of New South Wales
Sydney NSW 2052
www.fbe.unsw.edu.au/cf/

Published by Shelter NSW
377 Sussex Street
Sydney NSW 2000
www.sheltersnsw.org.au

Shelter Brief 42
ISSN 1448-7950

First published June 2010.

© Shelter NSW Incorporated 2010

This paper may be reproduced in part or whole by nonprofit organizations and individuals for educational purposes, so long as the City Futures Research Centre, Faculty of the Built Environment, University of New South Wales, is acknowledged.

Any opinions expressed in this paper are those of the author and do not necessarily reflect the views of Shelter NSW or the University of New South Wales.

Contents

1. Introduction.....	1
2. Policy context	4
2.1. Urban consolidation as a cornerstone of metropolitan plans	4
2.2. Strata title	6
2.3. The metropolitan development authority, compulsory land acquisition and strata scheme termination	8
2.4. Summary	9
3. The figures	11
3.1. Private dwellings.....	11
3.2. Social housing dwellings	15
3.3. Summary	16
4. Living well in greater density	17
5. Resident diversity and neighbour relations.....	21
5.1. Neighbourliness, social cohesion and sense of community.....	21
5.1.1. Design	23
5.1.2. Social mix	24
5.2. Common conflicts.....	29
5.2.1. Use of common areas.....	29
5.2.2. Noise intrusion.....	31
5.3. Households with specific needs.....	34
5.3.1. Families with children	34
5.3.2. People with impaired mobility.....	38
6. Design	41
6.1. Household level	41
6.1.1. Interior space, layout and storage	41
6.1.2. Private open space	45
6.1.3. Light, ventilation and thermal comfort	47
6.2. Building or development level.....	48
6.2.1. Design and building quality	49
6.2.2. External appearance	51
6.2.3. Penetration of noise and smells	52
6.2.4. Common areas	56
7. Conclusion	60
8. References.....	63

Figures

Figure 1: Percentage of lots investor owned for NSW and Sydney by LGA, May 2009	13
Figure 2: What have the disputes that have occurred in your strata scheme been in regards to? (Tick all that apply)	20

Tables

Table 1: Summary of legislation pertaining to strata title developments in NSW	7
Table 2: Occupied Private Dwellings by Dwelling Type, Sydney, New South Wales and Australia, 2006	12
Table 3: Attributes of five major factor groups of apartment residents.....	15
Table 4: Number of public and social housing apartment dwellings apartments in NSW 2006.....	16

1. Introduction

Residents of Australia's major cities are increasingly living in higher densities. Concerns about the negative impacts of urban sprawl as well as the need to accommodate rapid population growth have led to state, and more recently Commonwealth, governments promoting more higher density developments in strategic areas (e.g. along transport corridors) and identified urban renewal sites. While there has been much academic debate about the relative pros and cons of the urban consolidation agenda, there has been less discussion about how to make urban consolidation work from the perspective of residents.

Higher density living has the potential to lead to a number of negative impacts on quality of life and resident satisfaction. This is evidenced through complaints and issues identified by social housing tenant groups, tenant advisors, as well as peak body organisations operating in the private sector. Some of these issues have received significant attention in the mainstream media and have also led to actual and proposed changes to related legislation (for example the *Strata Schemes Management Act NSW 1996*).

In this report we provide a review of Australian and international literature on issues faced by people living in higher density. Our focus is at the level of resident experience and at the scale of the building or development¹. This review is supported by the input of a range of stakeholders with an extensive knowledge of these issues who participated in a workshop discussion in Sydney (see below for a list of participants). We investigate these issues with regard to the lived experience of residents in higher density dwellings across tenures and forms of housing provision (owner-occupiers, private renters, public housing tenants and other social renters).

The problems that commonly arise in higher density living are not necessarily unique to this kind of residential development. However, the distinct built forms and social contexts associated with higher density living make these living environments more prone to particular kinds of social issues impacting quality of life and community wellbeing. Higher density developments are distinct because:

- their occupants live in relatively close proximity to each other, and
- they are characterised by particular design forms where at least some built features and facilities are shared.

The close proximity of neighbours and shared built features in higher density dwellings necessitates a greater degree of shared responsibility and decision-making amongst owners, tenants and property managers. In some cases, the necessity for negotiation between different stakeholders can lead to tensions both in regards to social relations and ideas around acceptable behaviour in respect to use and maintenance of buildings and common areas. The power to negotiate, however, also differs between residents depending on their tenure, their landlord, their income and the management structure of their development.

The issues that we focus on are problems arising when households are dissatisfied with their dwelling because it does not meet their needs or expectations; problems arising in interpersonal relations between neighbours due to, for example, a perceived lack of privacy or a clash of lifestyles; and problems arising in the greater social environment at a building or development level, such as alienation or concerns about the stigma or negative image of a building/development. We also consider possible solutions to these problems, and provide some best practice examples.

While this document draws on a broad range of literature from around the world, our focus in analysing this documentation is on information that will be of interest and use in New South Wales (NSW). In the next chapter we provide an overview of the policy setting in NSW in which this research sits, before going on (in Chapter 3) to describe the numbers and distribution of higher density residents in NSW. The remainder of the report will draw upon the findings from the literature review and workshop. Chapter Four introduces some of the major issues that have arisen in NSW for people living in higher density. Chapter Five provides a more detailed analysis of major issues pertaining to neighbour relations and Chapter Six focuses on design considerations. Where possible, both chapters provide reference to potential solutions proposed in the literature. The report concludes with a discussion of the possible financial, health and well-being implications for residents living in higher density, as well as the factors that influence the ability of different residents to mitigate the associated potential issues, and to enable them to make the most of the benefits higher density living has to offer.

A note on terminology

When we speak of ‘higher density’ housing, our focus is on people living in apartments (including flats and units), whether these are in medium density developments (e.g. a two-story block of six apartments) or high-density developments (e.g. a high-rise apartment block). Where we reference authors who have focused on specific issues relating a particular density or property type, we use the author’s own terminology. While the focus of our report is on people living in apartments, many of the issues raised may also be of concern to people living in row houses, terrace houses and semi-detached properties, where neighbours share a common wall and in some cases some form of common property ownership.

Workshop participants

We are extremely grateful to the following people for taking part in a half-day workshop in Sydney in order to discuss issues surrounding living well in greater density and to help us develop our areas of focus in this report. Comments made by workshop participants are referred to throughout the report.

- Grant Arbuthnot – Principal Solicitor, NSW Tenants Union
- Gerry Chia – Secretary, Owners Corporation Network

- Wally Patterson – Managing Director Dynamic Property Services [strata and community managers], chair of the NSW Urban Development Institute of Australia’s strata committee, Owners Corporation Network member
- Mary Perkins – Executive Officer, Shelter NSW
- Richard Perkins – General Manager, City West Housing
- Jim Robertson – Mediator, Mediation Services Unit, NSW Fair Trading
- Judy Singer – Public housing tenant and spokesperson
- Jacqui Swinburne – Coordinator, Inner Sydney Tenants Advice and Advocacy Service

2. Policy context

Urban policy in Australia has changed significantly over the last few decades. In particular, concerns have increasingly been raised about ‘suburban sprawl’ and its assumed associated negative environmental, health and social impacts (Major Cities Unit 2010: 87; Newman & Kenworthy 1998; Parliament of Australia 1992; Ohlin 2003). In response, urban planners have focused on higher density forms of housing for the compact cities they see as the solution to the problems generated by residential urban growth (Bunker & Holloway 2007; Forster 2004; Healy & Birrell 2004; Searle 2007). In essence, this means providing new housing by ‘building up’ (higher density dwellings within the existing urban footprint) rather than ‘building out’ (detached dwellings on the urban fringe), often referred to as urban consolidation.

2.1. Urban consolidation as a cornerstone of metropolitan plans

In NSW, urban consolidation has been a major component of metropolitan plans since the late 1980s (Kübler & Randolph 2008: 15) and was a key feature of the 1988 (Sydney into its Third Century), 1995 (Cities for the 21st Century), 1999 (Shaping our Cities) and 2005 (City of Cities) metropolitan plans. NSW is not alone in this regard. The metropolitan plans of all five major Australian cities include plans for increasing urban consolidation (NSW Department of Planning 2010; Queensland Government 2009, Victorian Department of Sustainability and Environment 2006; Planning SA 2010; Western Australian Planning Commission 2004), which has led some commentators to consider urban consolidation as the dominant policy orthodoxy guiding strategic metropolitan planning in Australian cities (Forster 2006).

The 2005 metropolitan strategy aims to deliver 60-70% of new housing in existing urban areas (NSW Department of Planning 2010: 134). In order to provide this new housing, dwellings densities in these areas will need to be increased. The document states that in the larger state strategic centres, high rise apartments are usually the only financially feasible option due to high land prices, but that medium density developments (such as townhouses and villas) may be feasible in smaller local centres (NSW Department of Planning 2010: 140), providing some indication of the form this increased density will take.

At the local (council) level, each council in Sydney has formulated residential development strategies to accommodate more compact cities. Those councils that did not develop their own plan (Burwood, Wyong and Ku-ring-gai) were covered under state Environmental Planning Policy (SEPP) 53 ‘Metropolitan Residential Development’ under which part 4 states that:

The objective of this Part is to provide an opportunity to stimulate redevelopment of specific sites and localities that are suitable for multi unit housing ... in order: (a) to increase housing supply and choices, and (b) to promote social and economic development, by allowing development of sites and localities close to transport, employment opportunities and other

relevant services, where local environmental planning controls do not satisfactorily deal with redevelopment of that kind.

In other words, the Minister can alter local planning provisions to facilitate higher density development. At the time of writing, Ku-ring-gai was the only remaining council to which this SEPP applied.

Much of the contemporary academic and policy debate about urban consolidation has focused on the assumed pros and cons of higher density housing as opposed to lower density suburban development (e.g. Newman 2005; Rescei 2005). Such discussions have largely focused on infrastructure provision, transport use and environmental sustainability outcomes of a more compact city (Breheny 1995; Dey *et al* 2007; Jenks *et al* 1996, 2000; Neuman 2005; Newman & Kenworthy 2006; Perkins *et al* 2009; Trubka *et al* 2009). As this report focuses on the experiences of residents living in higher density (rather than larger-scale urban planning considerations), we will not discuss these issues in detail in this report. However, a number of interrelated social outcomes of urban consolidation policies have also been proposed in the Australian context based upon certain assumptions about the lived experiences of people living in higher density. These include (but are not limited to) the proposal that an increase in higher density development will lead to greater housing choice and affordability and better matching of household needs to dwelling characteristics; and improved social sustainability and cohesion in vibrant mixed use centres and communities (see Bunker *et al* 2005a, 2005b, City Futures Research Centre 2008). These are discussed briefly below.

It has been widely claimed in both planning and urban analysis circles that higher density housing offers a wider range of housing opportunities better matched to emerging demographic profiles. This argument is based on the assumption that there is a mismatch between emerging household types (the increasing number of smaller households) and available dwellings. These assumptions have been called into question on two fronts. First, the assumption that smaller households will choose to live in smaller dwellings has been called into question in the Australian context (Easthope *et al* 2010; Judd *et al* 2010; Troy 1996; Wulff *et al* 2004; Yates 2001). Second, there is much evidence that residents of higher density properties do not all fit within this assumed demographic (Bunker *et al* 2005b). For example, recent Australian research suggests strongly that such housing is attracting many different types of households, including families with children on low to moderate incomes (Easthope *et al* 2010; Randolph 2005; Randolph & Holloway 2005).

Similarly, the idea that higher density living in and of itself facilitates the creation of social capital – social contacts that encourage personal and community integration – have also been called into question and implies physical determinist assumptions. In particular, a significant proportion of this market is privately rented (see Chapter Three) and experiences high mobility rates (Randolph 2005), with implications for the creation of stable long-term communities. Further, while the New Urbanism planning movement has stressed the benefits of mixed use developments with a diverse resident profile (Leccese & McCormick 2000; Talen 2008), higher density development will not necessarily result in more socially mixed communities. Indeed, there is strong evidence of segmentation between the different apartment submarkets within Sydney (Bunker *et al* 2002; Bunker *et al*

2005b). Also, the impacts of close proximity to neighbours may not always be positive, as evidenced by the incidence of neighbour disputes and problems addressed in more detail below (see Chapters Four and Five).

In summary, the expectations placed on urban consolidation as a planning tool are very high. An increase in urban density – and hence in the absolute numbers, and relative percentages, of higher density properties – is portrayed as essential for the economic, social and environmental sustainability of Australia’s cities. While the extent to which the various economic, social and environmental benefits of urban consolidation assumed in metropolitan planning documents remain debated, land constraints coupled with rapid population growth will ensure a denser future for Australian metropolitan centres. It is therefore essential that issues related to living in higher density are identified and adequately dealt with, in order to produce good living conditions and housing that suits the needs of its residents.

2.2. Strata title

The development of higher density housing was given a substantial boost in the early 1960s through the passing of strata titling legislation (the *Conveyancing (Strata Titles) Act NSW 1961*), which enabled, for the first time in Australia, the possibility of individual apartments being sold to individual owners. Today, this is the most common form of property title in higher density dwellings. Strata title allows for the subdivision of land and/or buildings into units (lots), which can be owned by individual owners, and common property, which is owned communally by all owners.

Almost all privately owned apartments in NSW, and a large proportion of townhouses and villas, are strata titled. While some higher density dwellings are under other forms of communal title (such as company title and tenancy in common), these are in the minority. There are also some multi-unit rental dwellings that remain under Torrens title, which is possible when one owner owns the whole property (e.g. an entire block of apartments). In the private sector this is relatively uncommon, however there are also public and community housing dwellings that fall under this category.

As the majority of higher density dwellings are (and will continue to be) under strata title, the government’s urban consolidation agenda will rely largely upon the effective running of the strata title system. Indeed, the proposal to change the strata title legislation to enable a majority (rather than 100%) to decide whether a scheme should be terminated (discussed further below) has been made in recognition of this reliance on strata titling as a mechanism for increasing densities in our urban areas.

There are two major groups of legislation affecting strata titled properties: legislation pertaining to the development of strata title properties and legislation pertaining to the management of strata title properties. Table 1 below outlines the relevant legislation in each of these categories. Also important is legislation pertaining to the conduct of professionals working in the strata title industry, specifically the *Property, Stock and Business Agents Act NSW 2002*.

TABLE 1: SUMMARY OF LEGISLATION PERTAINING TO STRATA TITLE DEVELOPMENTS IN NSW

	Development	Management
Name of act(s)	Strata Schemes (Freehold Development) Act 1973	Strata Schemes Management Act 1996
	Strata Schemes (Leasehold development) Act 1986	
Subsequent documents	Strata Schemes (Freehold Development) Regulation 2002	Strata Schemes Management Amendment Act 2004
	Strata Schemes (Leasehold Development) Regulation 2002	Strata Schemes Management Regulation 2005
		Strata Schemes Management Amendment (Sinking Funds) Regulation 2006
		Strata Management Legislation Amendment Act 2008

Concerns have been raised about the ability of the strata model in its current form to achieve effective urban consolidation (Thomson 2007). In particular, problems have been noted in regard to the regulation of residents, developers and owners' corporations as well as in regard to structures of decision-making and representation within the strata system. As is evident in Table 1, the strata title legislation has already undergone significant reform. In addition, the Mayor of Sydney City Council has recently proposed further reforms to the Strata Schemes Management Act (Moore 2009). Despite the observed limitations of the system, NSW has some of the most tried and tested strata legislation in the world. The *Conveyancing (Strata Titles) Act NSW 1961* was the forerunner to legislation in other states and territories in Australia and has also formed the basis of strata title legislation in many other countries, including Canada, Singapore, South Africa, New Zealand, Indonesia, Malaysia and Brunei (Easthope & Randolph 2009).

We refer to issues relating to the strata title system throughout this report. However, given our focus on living well in greater density across tenures and forms of property ownership, it is beyond the scope of this report to provide a comprehensive review of the NSW strata title system as it impacts upon resident experience. The authors are currently working on a separate project dealing with these issues and information on this project can be accessed at:

<http://www.fbe.unsw.edu.au/cf/research/cityfuturesprojects/governingthecomcompactcity/>

2.3. The metropolitan development authority, compulsory land acquisition and strata scheme termination

Two documents have been released by the NSW State Government in 2010 which mention the intention of the NSW Government to establish a Sydney Metropolitan Development Authority to manage urban renewal. These are *Sydney Towards 2036* (a review of Sydney's Metropolitan Strategy) and the *Metropolitan Transport Plan*.

The Sydney Metropolitan Development authority would be responsible for paving the way for higher density developments in identified urban renewal sites (NSW Government 2010). The Authority would focus on transport corridors and centres prioritised by the Metropolitan Transport Plan and Metropolitan Strategy Review (NSW Government 2010: 26). The Department of Planning is also preparing an Urban Renewal State Environmental Planning Policy (SEPP) to "consolidate and streamline the rezoning process for areas that are defined as urban renewal precincts" (NSW Government 2010: 26).

Further to this, the government has proposed two significant legislative reforms to make it easier to undertake higher density development in identified urban renewal sites:

- reducing the majority of strata title holders required to enable strata redevelopment within defined urban renewal precincts; and
- enabling compulsory acquisition of property covered by an adopted urban renewal precinct plan in situations where achieving an urban renewal outcome is at risk - even where the property may be on sold for private development (NSW Government 2010: 26).

The first of these proposals is essentially to change the laws relating to the termination of strata schemes so that it is no longer essential for 100 per cent of the lot owners, mortgagees and lessees to agree to a termination, which is the first step to in creating a new development on a site. As noted by Easthope and Randolph (2009: 254), there have been relatively few terminations of strata schemes in NSW and "the normal course of events, especially in larger schemes, appears to have been for termination not to take place, because it can be very difficult to secure a 100 per cent vote on any issue". This is a concern for planners interested in urban renewal in two respects. First, termination is required before an old strata building in serious disrepair can be rebuilt and second, termination is required in order to knock down a medium density strata building (with four lots for example), and replace it with a higher density building (with 20 lots for example). Such changes to the laws on termination have been under discussion in NSW since at least 2003 (e.g. Property Council of Australia 2003; Property Council of Australia 2010). Easthope and Randolph (2009: 254-255) explain:

A number of alternatives to the current system have been proposed, including a unanimous vote at a meeting of the owners' corporation; fixed terms for strata schemes (as is the case in some US schemes); and the co-operative re-development of strata schemes between existing lot owners and a developer (Sherry 2006). However, the most popular alternative has been to base termination on a majority (rather than a unanimous) decision, with proposals ranging from 75 per cent to 90 per cent of owners voting for termination (see for example, Property Council of Australia 2003). Such an approach, if adopted, is likely to draw upon the experiences in Singapore where a 90 per cent vote is required to terminate the strata title for buildings less than 10 years old, while an 80 per cent vote is required for buildings older than 10 years.

While termination of strata schemes is an important component of urban renewal plans, changes to the laws regarding termination conflict with predominant Australian notions of individual property rights and are likely to lead to extensive conflict and debate (Easthope & Randolph 2009: 255).

The second of these proposals is for the State Government to have the power to compulsorily acquire land for development by private developers to pave the way for more higher density developments. This is particularly important in those situations where the development of a higher density urban development requires (in order to obtain the land needed for the development) the purchase of a number of relatively small, individually owned lots of land. In such situations, re-developments can be halted, or significantly delayed where individual owners do not wish to sell their land, or hold out on the property in the hope of pushing up the sale price. It is likely that debates will be ongoing regarding this proposal, with serious concern regarding to whom the profit from the development should flow. This is important as the profits involved can be significant where land is re-zoned and density increased.

In the meantime, at the national level, the Council of Australian Governments (COAG) has agreed that the Housing Supply and Affordability Working Party will report on, amongst other things:

- the potential to reform land aggregation, zoning and planning processes and governance, including assessing and leveraging the work of Housing and Planning Ministers and the Business Regulation and Competition Working Group (by mid-2010); and
- the impacts of titling systems (such as residential strata title arrangements) on the housing supply market (by end-2010) (COAG 2010: Attachment B).

Certainly, this national push appears to be largely in line with the NSW State Government agenda regarding urban consolidation.

2.4. Summary

The NSW State Government has turned to urban consolidation as a planning solution for a rapidly increasing population, constraints on land, and the desire to make the most of existing (and future) infrastructure provision. On the ground, this

will continue to play out in the form of increasing residential densities in existing urban areas, supported by Local and State Government planning controls in conjunction with increasing government interest at the Federal level. In turn, this will almost certainly result in an increase in the proportion, and absolute number, of the population living in higher density dwellings in NSW. If the urban consolidation is to be successful, it will be essential to ensure that negative impacts faced by residents of higher density developments as a result of living in higher density are addressed, and solutions proposed.

3. The figures

While apartments have been built in Australia since the early 20th Century – apartments have been built in Sydney since at least the 1930s (Butler-Bowdon & Pickett 2007; Cardew 1970; Judd and Dean 1983; Spearitt 1978 and 2000) – recent years have seen significant increases in higher density development in Australian cities. This has been the result of both the introduction of strata title legislation around the country in the 1960s and 1970s (which enabled individual apartments to be sold to individual owners) and the move towards urban consolidation in state government metropolitan planning.

The figures involved are certainly significant. In 2006, Sydney had a population of 4.1 million people, which is expected to reach 5.4 million by 2026 (ABS 2008: 3222.0). Keeping in mind the fact that Sydney covers an area of 1,580 square kilometres (in comparison Greater Paris has a population of 3 million and an urban area of 374 square kilometres), it is not difficult to see that a case can be made for increasing residential densities.

3.1. Private dwellings

In 2006, 28.8% of all private dwellings in NSW were higher density dwellings (apartments, townhouses etc.). The figure was 37.5% in Sydney (see Table 2). The 2006 census reports that 23.9% of the population in the Sydney statistical division lived in a flat, unit or apartment (ABS 2006: 2068.0).

TABLE 2: OCCUPIED PRIVATE DWELLINGS BY DWELLING TYPE, SYDNEY, NEW SOUTH WALES AND AUSTRALIA, 2006

Private dwellings	Sydney (major statistical region)	% of total occupied dwellings in Sydney	NSW	% of total occupied dwellings in NSW	Australia	% of total occupied dwellings in Australia
Occupied private dwellings	1,521,466	-	2,470,451	-	7,596,183	-
Separate house	939,075	61.7%	1,721,777	69.7%	5,685,387	74.8%
Semi-detached, row or terrace house, townhouse etc	180,162	11.8%	241,351	9.8%	702,550	9.2%
Flat, unit or apartment	390,679	25.7%	470,496	19.0%	1,076,315	14.2%
Other dwellings	10,233	0.7%	34,819	1.4%	127,337	1.7%
Not stated	1,317	0.1%	2,008	0.1%	4,594	0.1%
Total private dwellings (includes unoccupied private dwellings)	1,643,676	-	2,728,719	-	8,426,559	-

Source: ABS 2006

The higher density residential stock is characterized by rental properties. Significantly, while only 28.4% of all dwellings in NSW are rented, more than half of the apartments in the state are rented (ABS 2006). An analysis of the strata database held by the NSW Land and Property Management Authority undertaken by the City Futures Research Centre (2010) found that in May 2009, only half (49.9%) of the residential strata lots in NSW were owner-occupied². There was a higher proportion of owner-occupied lots in the Sydney metropolitan area (51.0%) than in the rest of NSW (44.8%). Within the Sydney metropolitan area, the highest concentration of owner-occupied lots were found in the LGAs of Pittwater (67.8%), Ku-Ring-Gai (66.5%) and Bankstown (65.5%). In May 2009, half (50.1%) of the residential strata lots in NSW were investor-owned (i.e. rented). There was a higher proportion of investor-owner lots in the rest of NSW (55.2%) than in the Sydney metropolitan area (49.0%). Within the Sydney metropolitan area, the highest concentrations of investor-owned residential strata lots were found in the LGAs of Sydney (59.5%), North Sydney (58.1%) and Holroyd (56.8%) (see Figure 1).

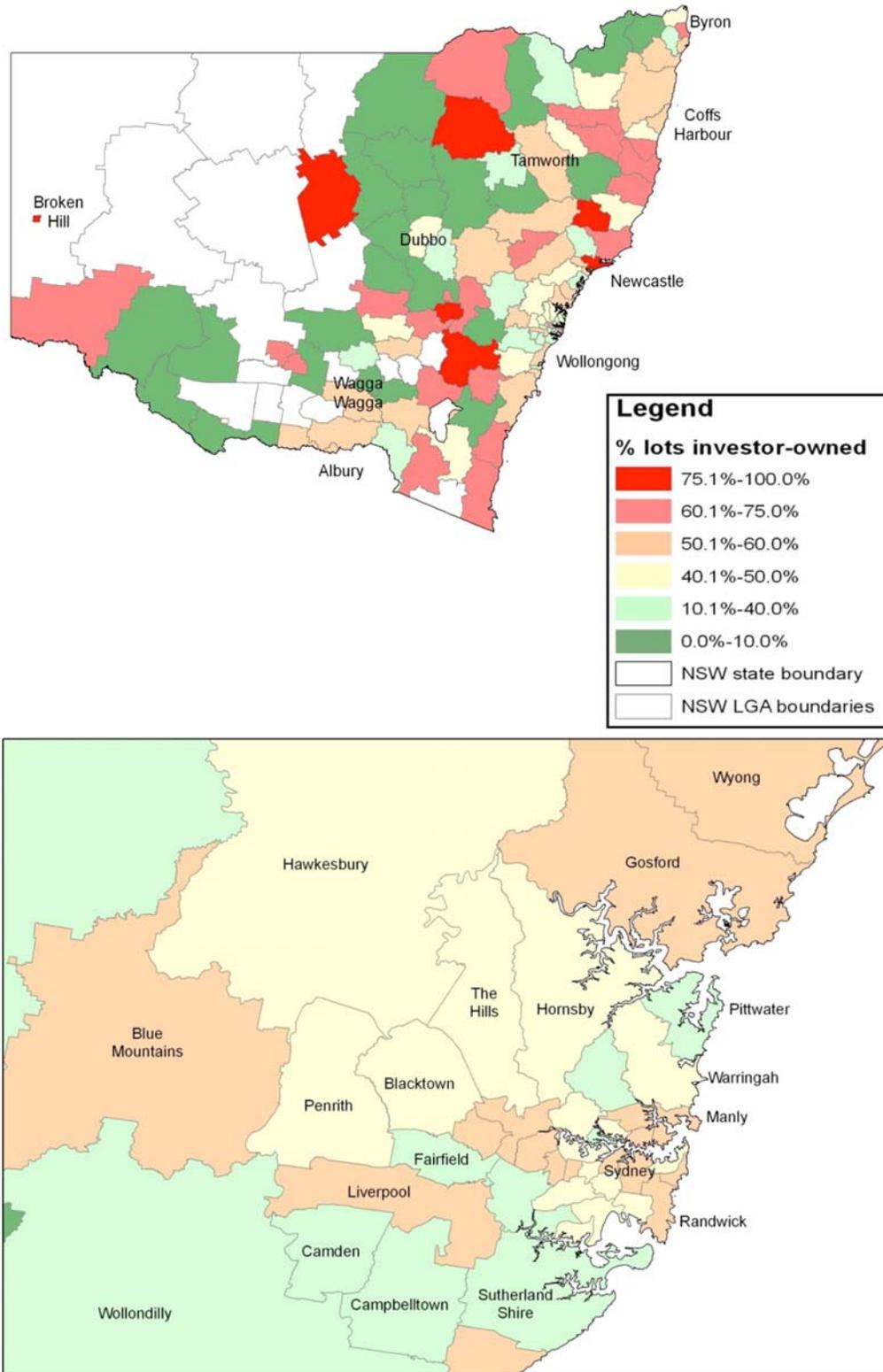


FIGURE 1: PERCENTAGE OF LOTS INVESTOR OWNED FOR NSW AND SYDNEY BY LGA, MAY 2009
 Source: City Futures Research Centre 2010

As well as considering the absolute numbers of people living in higher density properties and their tenure, it is also important to recognise the characteristics of the dwellings themselves. In NSW almost 40% of the apartment market is comprised of one and two bedroom properties, in comparison to less than 10% of the detached dwelling market (ABS 2006). This observation regarding dwelling sizes in this sector has led to a number of assumptions regarding the types of households who live in higher density housing within the private sector. Notably, Sydney's Metropolitan Strategy alludes to the 'fact' that smaller households will both desire to live in higher density properties and will dominate their occupancy:

The trend to smaller households is partly driven by the ageing of the population, which tends to result in more single and two person households. This will inevitably lead to a greater demand for smaller housing with good access to shops, transport and services such as health. Increasing affluence, and more single and young people living alone are also major contributors to the increased demand for housing. These changes in household type and therefore occupancy rates mean that total demand for housing will be greater than population growth and a wider mix of housing types will be required (NSW Department of Planning 2005: 24).

However, while the assumption is often made that higher density dwellings are the natural domain of smaller households (young childless households and empty nesters), the existing research in Australia suggests that this is not in fact the case. Indeed, the assumption that smaller households will both want and choose to live in smaller (higher density) dwellings has been called into question (Easthope *et al* 2010; Judd *et al* 2010; Troy 1996; Wulff *et al* 2004; Yates 2001). The dwelling type that a household selects is the result of a number of choices and constraints. While some households may choose to live in apartments because of the convenience of a small property and readily available facilities, for others this choice may be a trade off for location and/or affordability.

Higher density housing in the private sector is highly segmented with a number of dominant sub-markets, each reflecting a myriad of different choices and constraints open to higher density residents. These include a high value rental stock concentrated in inner Sydney, along water-frontages and in the coastal eastern and northern suburbs, and a lower income rental market concentrated in low value town centres in suburban areas. Other submarkets cater for moderate income and younger rental and first homeowners (Bunker *et al* 2005b). Recent research undertaken by the City Futures Research Centre (2009) has identified five major sub-markets within the private³ higher density population in Sydney (greater metropolitan Sydney), through an analysis of data from the 2006 Census. Twenty-eight socio-economic variables were derived from the ABS data, standardised and subjected to Principal Components (Factor) Analysis to establish the different attributes of people living in higher density dwellings. The factor analysis generated five factors that explained 83% of the total variance within the high-density population. Each group was given a name to summarise the dominant characteristics of its members. Table 3 provides an overview of the dominant characteristics of each factor group.

TABLE 3: ATTRIBUTES OF FIVE MAJOR FACTOR GROUPS OF APARTMENT RESIDENTS

Factor Group	Dominant household type	Dominant age range	Dominant income range	Dominant tenure	Dominant countries of birth
Battlers	Families with children		Low income (<\$50,000 p.a. common)	Rental and ownership	Australia, China, India, Vietnam
Economically Engaged	Singles and couples	Young adults through to early middle-age	Medium to high income (>\$90,000 p.a. common)	Rental	
Apartment Elite	Couples	Over 50	High to very high income (>\$130,000 p.a. common)	Rental and ownership	Australia
Residentially Retired	Singles	Over 65		Ownership	Australia and United Kingdom
Achieving Education	Singles and group households	Under 25		Rental	China, India and Korea

Note: Blank squares indicate no dominant attribute

Source: Easthope *et al* 2010

Importantly, despite planning assumptions that apartments are primarily the domain of singles and couples, the research found that the ‘Battler’ group is an extremely significant sub-sector of Sydney apartment residents, and dominates the apartment market in many parts of the city (Easthope *et al* 2010).

3.2. Social housing dwellings

The public and community housing sector in NSW also contains a significant number of apartments. In 2006, there were 40,254 apartment dwellings in public (34,933) and community, co-operative or church group (5,321) housing in NSW (see Table 4).

TABLE 4: NUMBER OF PUBLIC AND SOCIAL HOUSING APARTMENT DWELLINGS APARTMENTS IN NSW 2006

Dwelling structure	Flat, unit or apartment attached to a house	Flat, unit or apartment in a four or more storey block	Flat, unit or apartment in a three storey block	Flat, unit or apartment in a one or two storey block	Total
Housing co-operative/ community/church group	19	866	845	3591	5321
State housing authority	27	6472	10363	18071	34933
Total	46	7338	11208	21662	40254

Data source: ABS 2006

Since 2006, these figures have increased in the community sector, with 6,551 flat, unit and apartment community housing dwellings in 2008-09 in NSW (based on results pertaining to administrative data, AIHW 2010: 7). If semi-detached, row or terrace houses and townhouses are also included, the figures increase. For example, in 2006 there were 21,904 semi-detached, row or terrace house public housing dwellings in NSW (ABS 2006) and in 2008-09 there were 1,078 semi-detached, row or terrace house community housing dwellings in NSW (results pertaining to administrative data, AIHW 2010: 7).

3.3. Summary

A significant proportion of the private and social housing stock in NSW is higher density dwellings and approximately one in four residents of greater metropolitan Sydney currently live in a higher density dwelling. The population who live in higher density properties in NSW (and particularly in Sydney) is very diverse. However, the sector is characterised by a relatively high rate of rental (as opposed to owner-occupation) and is an important sector for people on low to moderate incomes, including families with children. In part this is because the private apartment stock is composed of smaller one and two bedroom properties which are relatively more affordable than detached houses within a particular area. Discussions about how to live well in greater density, while of relevance to all higher density residents, therefore have particular salience for those concerned with improving the housing circumstances of renters and of low to moderate income households.

4. Living well in greater density

Our focus is on the lived experience of residents in higher density properties at the level of the building or development, and particularly on issues that have been shown to affect quality of life and residential satisfaction. If government policies of urban consolidation are to be successful in our cities, then it is essential that the quality of life and residential satisfaction of the residents of higher density properties are taken seriously.

With regard to quality of life, there is a significant literature discussing the physical and psychological health effects of living in higher densities. Much resistance in Western societies to higher residential densities has been associated with the expectation that living in higher density increases stress levels, inactivity and social withdrawal, concerns about security, risk of disease and propensity for crime (Churchman 1999: 401; Hopkins 2007: 173). While these risks were certainly identified in higher density housing of previous centuries, they are not necessarily as likely in contemporary developments. Newman (1983: 63-65) argues that the factors are too complex to isolate living in higher density as the major cause of related health outcomes, and many of these links are no longer relevant with advances in health and improvements in urban environments and amenities, such as waste collection and water sanitation. Indeed, the contemporary literature indicates that today the impacts of higher density on health have more to do with the characteristics and mix of people who live in particular developments, and the design of those developments, rather than any inherent influence of density *per se* on health and wellbeing.

For example, Burton (2000: 1974-75) suggests that urban consolidation may have an adverse effect on social equity when poorer households are restricted in the amount of living space to which they have access. Since low-income households may have more incentive, as a result of financial pressures, to live in a smaller dwelling (often an apartment), they may be more exposed to health factors relating to overcrowding, including increased likelihood of depression and social isolation (see also Shelter 2005, 2010). Relating to this, Newman (1983: 66-67) explained that psychological studies on the stresses related to crowding relate more to the number of people living within rooms or buildings, rather than to the density of dwellings themselves.

In Australia, higher density housing has had an image problem stemming from the social problems associated with some high-rise blocks historically, especially in public housing. It is also likely that this perception of higher density housing as problematic was influenced by stigma associated with the predominance of renters in the private higher density market, compared with the detached house market, as well as an understanding of apartment living as a temporary stepping stone in a housing pathway ultimately leading to living in a detached house (Fincher 2004).

These popular perceptions have been significantly challenged over the past few decades in Australia, and especially in Sydney, with the government's push towards urban consolidation resulting in apartments increasingly being seen as a long-term or life-time housing option for a greater proportion of the population. At the same time, increasing recognition of the diversity of housing pathways (Beer & Faulkner

2009) – related to increasing incidences of marital breakdown, increasing numbers of young adults remaining in the family home, and partnering and having children later in life – has drawn into question the life cycle approach to housing pathways (Kendig 1984; Vulker 1986). In parallel with these changes, new apartment submarkets have emerged (as outlined in Chapter Three) catering to wealthy owner-occupiers and renters, niche markets and emerging lifestyle groups (such as downsizing empty nesters), significantly impacting upon the public perception of apartment living and, arguably, also increasing the lobbying power of apartment residents more generally in working towards improving the lived experience of higher density living.

The satisfaction and quality of life of higher density residents is obviously incredibly important to people living in higher densities. But it is also essential to recognise that resident satisfaction has a strong influence on patterns of housing choice, resident turnover and transience in the housing market (Hofer 2008: 81; James 2007b; James & Carswell 2008; Leishman *et al* 2004). As James and Carswell (2008: 5) explain, residential satisfaction is a concern beyond the quality of life of individual household members and can have significant impacts on the community as a whole:

Improving residential satisfaction is not only an important goal for property managers, but it also has significant social impacts. Residential dissatisfaction tends to increase transience...simply put, investing heavily in building neighbourhood or community resources and social ties does not make sense for a person who is planning to leave.

It is essential for the future of our cities that we ‘get urban consolidation right’. This means taking into consideration those factors that influence the quality of life and residential satisfaction of higher density residents, which will in turn impact upon whole urban communities. In the remainder of this report, we consider some of the major issues that have been shown to influence higher density residents’ quality of life and resident satisfaction under the headings ‘resident diversity and neighbour relations’ and ‘design’.

The commonly quoted catchphrase ‘pets, parking and parties’ identifies what are perceived by many in the industry to be the main areas of contention in higher density living. Though anecdotal, this catchphrase is a pithy summary of the main areas of concern raised in the media, in the international literature and in our workshop discussion.

Many studies have produced lists prioritising the most frequent and significant issues behind dissatisfaction, complaints and disputes in higher density housing (Hughes *et al* 1994: 203; Hunter *et al* 2005: 154; James & Carswell 2008; Metropolis Research 2005; Peper & Spierings 1999: 494; Sarkissian *et al* 2004). Noise always rates highly, along with other disruptive neighbour behaviour and the use and maintenance of common property. The major issues covered by the literature will be explored in more depth in the following chapters.

Recent Sydney media coverage of issues in higher density living closely reflects the concerns identified in the academic literature. Media coverage has focused on strata management problems (e.g. inadequate repairs and maintenance, incompetent strata

managers, resistance to bans on pets) and difficult interpersonal relations – e.g. inconsiderate neighbour behaviour, conflicting use of common areas, bullying by management. Noise, especially as transmitted through or exacerbated by hard floor surfaces, has been one of the most salient and ongoing issues discussed, and the negative effects of smoking on neighbours and potential mechanisms for mitigating these have also been prominent.

Jimmy Thomson's weekly Sydney Morning Herald column *Flat Chat* is the main media outlet for ongoing commentary and advice on issues related to higher density living in NSW. While most Flat Chat readers and contributors appear to be Sydney apartment owners, the major concerns voiced in Flat Chat are consistent with those raised by other media commentators and with the issues that the literature and our workshop participants identified as prominent in higher density living across tenures. A recent article by Thomson (Thomson, 2010b) and a survey of Flat Chat articles over the past twelve months reflect a number of major themes in concerns and complaints from higher density residents, which can be summarised as follows:

- conditions are inadequate for families with children;
- privacy and personal activity within the household are unduly limited due to the implications of density (e.g. children's play restricted for fear of noise);
- neighbour relationships are easily strained due to noise transmission and home modifications;
- repairs and maintenance are inadequate, expensive or poorly handled;
- rules and by-laws are too restrictive on lifestyle (e.g. pets or timber flooring are not allowed) and are difficult to challenge and enforce (e.g. visitor parking rules); and
- management (in-house and professional) is considered incompetent or ineffective.

Preliminary results of a survey currently being conducted by City Futures⁴ provide a good visual representation of the most frequent issues of concern in higher density living from a management perspective. Figure 1 shows the major causes of disputes identified by executive committee members in NSW strata schemes. While the sample of 185 respondents (as of June 1, 2010) is incomplete at the time of publication (the research is ongoing), these preliminary results provide further confirmation of the leading concerns for people living in greater density.

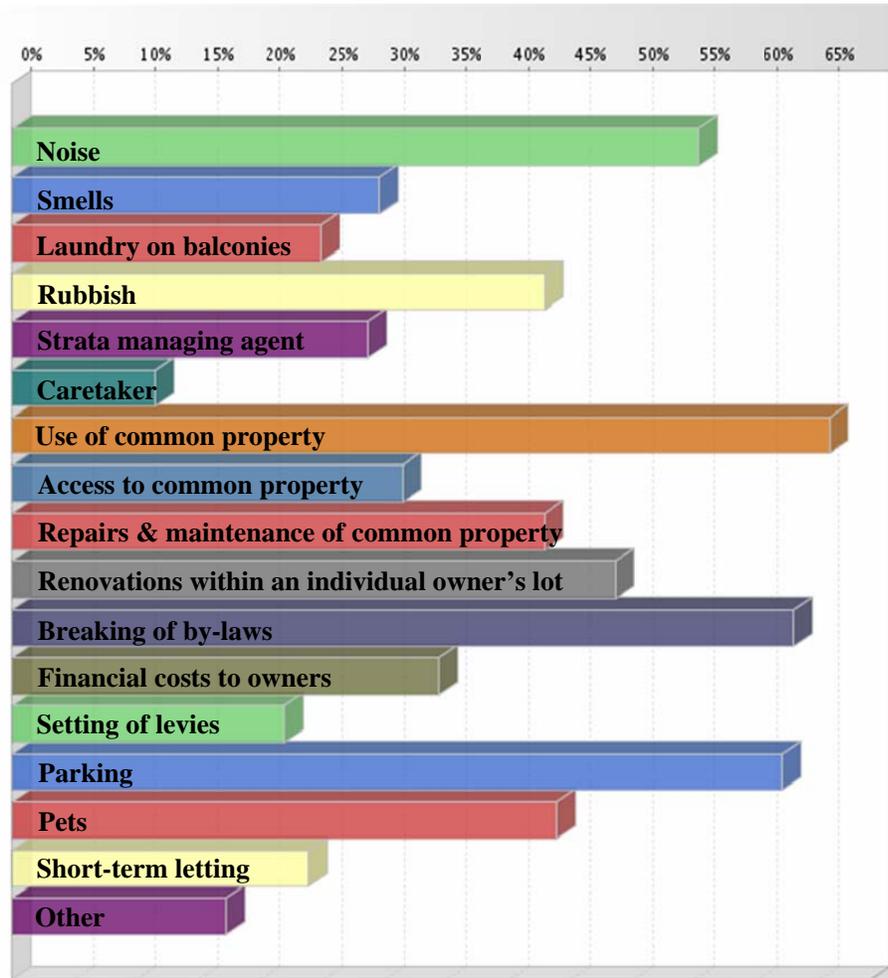


FIGURE 2: WHAT HAVE THE DISPUTES THAT HAVE OCCURRED IN YOUR STRATA SCHEME BEEN IN REGARDS TO? (TICK ALL THAT APPLY)
 Survey still in progress at time of publication; preliminary results as of June 1, 2010. Graph produced by Keysurvey.

The following chapters provide a more detailed review of some of the problems that can arise for people living in higher density. We have not covered all of the issues that can arise, but have focused on those that were considered most important by our workshop participants, those that have been raised most commonly in the NSW media, and those that have received most coverage in the international literature. Where possible we provide references to other sources with more detailed information, especially in our discussions of possible solutions to common problems. While we address these issues under the headings of neighbour relations and design, all of the issues discussed are interrelated to some degree and as such the subheadings should be considered a guide only.

5. Resident diversity and neighbour relations

As noted in the previous chapter, the influence of living in higher density on resident satisfaction and quality of life has at least as much to do with who is living in the property, as the density of the residence *per se*. Indeed, as we noted in the introduction, higher density developments are distinct because their occupants live in relatively close proximity to each other and they are characterised by particular design forms where at least some built features and facilities are shared. Because of this, neighbour relations are particularly important in higher density living arrangements in influencing quality of life and residential satisfaction. Indeed, Halpern (1995) claims that:

If a person is in frequent social contact with neighbours, the objective quality of the dwelling makes a small difference to the level of satisfaction with the dwellings. If a person in the same area is not in frequent social contact with neighbours, the objective quality of the dwelling makes a very large difference to residential satisfaction.

Furthermore, the demographic characteristics of residents in higher density dwellings (such as age, occupation and size of household) greatly impact upon demands on, and use of, both private and communal space, expectations regarding appropriate living arrangements and the nature of relationships and disputes with neighbours, all of which influence residential satisfaction.

In this section we first discuss neighbourliness, social cohesion and sense of community within higher density developments, with a focus on issues of design and social mix. We then outline some common conflicts that can arise between people living in higher density and focus on the use of common areas and noise intrusion. The chapter concludes with an examination of the issues faced by households with specific needs living in higher density, with a focus on families with children and people with impaired mobility. Throughout the chapter we provide reference to potential solutions to mitigate the problems of neighbour disputes that can arise in higher density housing.

5.1. Neighbourliness, social cohesion and sense of community

There is an abundance of literature that seeks to explain the importance of social interaction and sense of community on a neighbourhood or societal level, especially in the context of urban consolidation (e.g. Baum & Palmer 2002; Bramley & Power 2009: 33; Forrest & Kearns 2001; Lang & Hornburg 1998; McKenzie 2004; Parkes *et al* 2002; Sivam & Karuppannan 2009). While the focus of this report is on life at the development level, the general findings of such literature mostly compliment similar findings from the more localised setting of higher density complexes. At both development and neighbourhood scales, unfriendliness, lack of community spirit and limited social interaction with neighbours affect people's residential

satisfaction, general wellbeing and quality of life (Baum & Palmer 2002; Forrest and Kearns 2001; Henderson-Wilson 2008; Hopkins & Thomas 2002; Kearney 2006; Lang & Hornburg 1998; McKenzie 2004; Parkes *et al* 2002; Raman 2010: 66).

Higher density living has been associated with a number of negative social outcomes, ranging from crowding, territorialism and conflict to segregation and isolation (Bramley & Power 2009: 33-34; Sivam & Karuppanan 2009; Newman 1983). Indeed it has often been claimed, especially in prominent literature in the 1970s and 1980s, that the very nature of higher density living may tend to engender or aggravate deficits in social interaction, positive neighbour relations and sense of community (Churchman 1999: 401-02; Gifford 2007; Jephcott & Robinson 1971; Mitchell 1971).

However, links have also been established between higher density living and positive social interaction and cohesion leading to healthy communities (e.g. Bramley & Power 2009: 33-34; Foth & Sanders, 2005: 3-4; Newman 1983: 63-4, 67; Sivam & Karuppanan 2009). This apparent contradiction may simply reflect that higher density living may isolate some residents, while providing others with increased opportunity for social connectedness (Henderson-Wilson 2008: 9-10). Raman (2010: 67) notes that critics of higher density developments on the basis of crowding and its negative implications have often not taken building form and layout into consideration, factors that could greatly influence resident perceptions and experiences of density (discussed further in Chapter Six).

Social interaction and communal activity can engender shared values and cooperation which may be especially important in higher density environments where issues of privacy, security and considerate behaviour with regard to noise attract particular attention. A spirit of community can increase the likelihood of good communication, tolerance and collective problem solving (Mulholland Research and Consulting 2003: 17-18). For example, a UK study on neighbour noise found that community cohesion – identified by participants as people looking out for one another and feeling involved in the community – was associated with less complaints about noise (MORI Social Research Institute 2003: 29, 32). A well-developed community could also enable residents with common interests, needs or concerns regarding their development to mobilise and collectively address them (McKenzie, 2004). Conversely, higher density living environments lacking these social characteristics could be more vulnerable to disputes, dissatisfaction and reduced resident wellbeing.

Several articles on social interaction between residents divide the phenomenon into two or more forms or stages, which can be roughly drawn together in the following: acquaintance (a level of recognition and/or courteous greeting of neighbours); reciprocal helping (a level of trust and availability to, for example, borrow something off a neighbour or have them look after a pet when absent); participation (participating in structured community activities and events, like a barbecue or play group); and socialising (making friendships with and visiting neighbours informally) (Bretherton & Pleace 2008; Dixon & Dupuis 2003; Forrest *et al* 2002: 219; Forrest & Kearns 2001: 2130-2133; Ginsberg & Churchman 1985; McDonald & Brownlee 1993). At least one of these stages was found to be lacking in higher

density environments in each of these studies, and in some cases all aspects of social interaction were rare (Bretherton & Pleace 2008; Dixon & Dupuis 2003: 362; Forrest *et al* 2002: 219; Forrest & Kearns 2001: 2130-2133; Ginsberg & Churchman 1985; McDonald & Brownlee 1993).

Despite their close proximity, residents can live in an apartment for many years having little to no contact with their neighbours. This may be due to a lack of opportunity, but can also be a matter of choice. Residents have different preferences as to community participation and neighbour interaction (Foth & Sanders 2005: 7-8). For example, in their study on resident perceptions of affordable mixed tenure high density housing in the UK, Bretherton and Pleace (2008) found that some residents wanted a greater degree of community participation and felt community facilities and events were underutilised or of limited scope, while many residents were indifferent about community facilities and uninterested in communal interaction and activities, and simply desired “good neighbourliness, in terms of consideration and courtesy towards others” (Bretherton & Pleace 2008: 45-46, 48). There is some evidence that reduced contact with neighbours might reflect a withdrawal response to a feeling of crowding or lack of privacy in a higher density environment (Altman 1975; Forrest *et al* 2002: 236; Ginsberg & Churchman 1985: 482).

Lower levels of neighbourliness and a lack of sense of community have also been linked by a number of authors to a large portion of renters and a subsequently high rate of tenant turnover (Forrest *et al* 2002; Henderson-Wilson 2008; James & Carswell 2008; McDonald & Brownlee 1993; Randolph 2006). It is suggested that residents who do not have long term plans to live in a development are less likely to invest in building social ties or community participation (James & Carswell 2008). This may extend to renters having less interest in the ongoing social viability of a development than those who have longer term interests, namely owners, and owner-occupiers in particular (Forrest *et al* 2002; Randolph 2006: 26). Similar concerns were raised in our workshop discussion, along the lines of short-term rental leases doing little to promote a sense of ownership or community among residents, as frequent turnover undermines relationships. Indeed, longer-term residential leases were seen as an important mechanism to encourage community creation in strata schemes in New South Wales (workshop discussion).

In short, the degree to which residents in higher density housing experience neighbourliness, social cohesion and a sense of community appears to be largely context-specific, with some studies finding evidence of strong social ties in higher density developments, and others identifying problems with regards to social cohesion. Two of the factors considered very important in the literature in this regard are design and social mix.

5.1.1.Design

It has been argued that the design of the physical environment in higher density environments can increase or decrease the frequency and quality of social interaction, and that facilities and spaces designed to support contact and proximity can greatly enhance neighbourliness and community (Henderson-Wilson 2008: 9;

Kern 2007: 673; Lee 2005: 27; Raman 2010). Shared natural, open spaces have been especially linked with sense of community, neighbourhood satisfaction and other social, psychological and health benefits (Henderson-Wilson 2008: 9; Jackson 2003; Kearney 2006; Thompson *et al* 2007). Despite the recognition in the literature of the importance of a sense of community for quality of life and residential satisfaction in higher density, much mainstream higher density development has been found by researches to not have adequately taken this into account with regard to design. According to Foth and Sanders (2005: 3-4):

Apartment buildings provide the immediate surroundings in which location-based interactions with other residents would occur and communicative ecologies and social networks could emerge. However, their architectural design and layout (beyond issues of market demand, scope and scale) is rarely informed by societal developments and sociological insights and has hitherto been guided more by the functional requirements of the individual resident and by rental and investment returns than by the resident community at large and their need for public space and interaction.

This has been particularly observed in a lack of quality common space and facilities that promote resident interaction, with preference given to larger individual lots which generate more profit (Foth & Sanders 2005; Kearney 2006: 135; Lee 2005; Sarkissian *et al* 2004: 67).

Randolph (2006: 26) contends that, since occupants of higher density housing mostly do not have the opportunity to interact 'over the back fence', shared facilities – of a good quality in particular – are particularly important for engendering social interaction. Foth and Sanders (2005) refer to a case study on three apartment buildings in Australia to argue that common spaces facilitating interaction are a major contributor to well functioning residential architecture, especially due to the restrictions placed on entertaining and general activity by the smaller private units that characterise higher density living. Additionally, through common spaces and facilities, residents who would not usually have been able to afford certain facilities, such as pools or gyms, may share access to them and related social and health benefits (Foth & Sanders 2005).

5.1.2. Social mix

Resident satisfaction and quality of life in higher density living arrangements are tied to residents' norms and expectations about material and social aspects of their home (James 2007b: 472-473). Such norms and expectations tend to vary according to different demographic characteristics and lifestyles. Jephcott and Robinson (1971: 101-106) found that the demographic characteristics (such as age, occupation, relationship status and size of family) of residents in high rise dwellings greatly impacted their demands on space, their relationships with neighbours and their expectations and satisfaction with their living arrangements. Certain income or age groups, for example, may greatly appreciate some of the features offered by high rise apartments, such as lower cost or proximity to employment centres, while others may find that the limitations of space or social networks do not suit their

purposes (Thorne 1983: 75; Yates 2001: 516). Indeed, neighbour relationships can be strongly linked to similarities in lifestyle, stage in the life cycle, tenure type and ethnic and religious affiliation (Ginsberg & Churchman 1985; Parkes *et al* 2002: 2418).

Occupants of a given medium or high density development may represent a broad range of tenure types, household types, ethnic backgrounds, lifestyles and special needs. Diverse residential populations within higher density developments will naturally include individuals with differing norms and expectations, which may clash at times. Indeed, grouping many different kinds of households in close proximity can often result in a degree of friction (Chamboredon & Lemaire 1970: 6-7; Easthope *et al* 2009: 52; Gillis, 1983; Pinçon 1981).

It is important to acknowledge that conflicts can also arise in complexes or buildings that have a relatively homogenous population, just as they can in more socially mixed buildings. For example, buildings where the majority of residents work 9-5 and socialise outside of the building in the evenings may suffer from an absence of informal surveillance (with associated safety considerations) and are also less likely to share a strong sense of community with their neighbours. Furthermore, even when residents are demographically similar to one another, their values, lifestyles and expectations may be quite different, potentially contributing to neighbour disputes. However, mixed tenure developments and ethnically diverse social housing developments have emerged from the literature as contexts in which neighbourliness and community satisfaction have been particularly problematic due to different expectations, lifestyles and stereotypes (Bretherton & Pleace 2008; Chamboredon & Lemaire 1970; Gillis, 1983; Meredyth *et al* 2002; Parkes *et al* 2002; Pinçon 1981; Thompson *et al* 2007; Séguin 1997).

In the UK, Bretherton and Pleace (2008) found that a vocal minority of private sector residents resented their social renting neighbours on the basis of their social behaviour, maintenance of their dwellings and use of shared facilities, contributing to a lack of community spirit. This was especially true where affordable and market-value housing were physically separated. Although this antagonism did not represent the majority view, and was viewed by the researchers as potentially a pre-formed prejudice rather than a reflection on actual experience in their current housing, it reflected an element of tension preventing community cohesion (Bretherton & Pleace 2008: 46-47).

A study of Canadian public housing residents mostly living in rowhouses, Gillis (1983) similarly found that diverse developments where households *perceived* each other as different with regard to lifestyle and other factors may have been more susceptible to the negative impacts of urban density often identified in the literature (Gillis 1983). Another Canadian study found that there tended to be a lack of interaction – or simply rather shallow interaction – between people from different ethnic groups and very few examples of familiarity and neighbourliness in ethnically diverse higher density social housing (Séguin 1997).

Perceptions and stereotypes of different ethnic and socio-economic groups could also contribute to other barriers to community cohesion in public housing include fear of crime, which may prevent residents from interacting with neighbours of

different ethnic and religious backgrounds (Hopkins 2007; Meredyth *et al* 2002; Thompson *et al* 2007).

In the Australian context, Thompson *et al* (2007) noted that the kind of trust and cooperation generated by community interaction and social bonds are particularly important in low-income and ethnically diverse neighbourhoods. Similarly, Meredyth *et al* (2002) noted that while factors like language differences were “a major fault line between residents” in the Melbourne public housing estate they studied, isolation from the wider population actually strengthened relationships with, and dependence on, other residents of the same language and ethnic group. This can be viewed as developing a number of different communities to which residents belong, although it may take away from a common feeling of belonging or community spirit across an estate.

Suggestions and solutions

Encourage community interaction

Foth and Sanders (2005: 8-9) suggest three methods of stimulating resident interaction in apartment complexes:

1. Serendipity (designing public spaces to provide inviting spaces that are easily accessible at convenient locations to enable residents to have relaxed, unrushed social contact).
2. Socio-cultural animation (designing spaces such as BBQ sites which encourage group activities to be organised).
3. Digital augmentation (designing for good internet access and creating a virtual community network. For example, each having profiles and being able to send invitations, remote surveillance, neighbourhood information etcetera).

Many of the design suggestions raised in the literature fit neatly into the categories identified above:

Serendipity

A number of innovative design features and principles have been developed by different architects to encourage serendipitous interaction, such as enlarged stairway landings with seating and protrusions in corridors outside apartment doors to enable people to congregate (Foth & Sanders 2005). Sarkissian and Kerr (2003) also recommend avoiding formal demarcation in common space and ensuring direct connections between commonly used spaces.

Socio-cultural animation

People are different and some may want to participate more, so approaches to encourage interaction needs to be diverse and voluntary (Foth & Sanders 2005: 7-8). However, there are some things that can be done to encourage group activities and interaction.

Community gardens (which could be rooftop gardens) are seen as a particularly important mechanism to encourage community interaction in higher density developments (Henderson-Wilson 2008; Thompson *et al* 2007). The value of community gardens was discussed at the workshop, especially their ability to facilitate inter-generational activity and better community mix. Importantly, where these gardens operate on a roster or volunteer system this can help to cut down operating costs (workshop discussion).

Common rooms were also suggested as beneficial in higher density developments by our workshop participants, particularly in larger buildings or developments. Such rooms can provide a space where parties, community groups, hobby clubs and play groups can be held with residents. Such rooms may also be beneficial in allowing places where people can undertake noisy activities (such as singing, or playing the piano), which may disturb neighbours if undertaken within their own apartments (workshop discussion). Indeed, Henderson-Wilson (2008: 10) provides the example of Atherton gardens public housing estate in Melbourne, which has its own choir.

Digital augmentation

On-line networking is increasingly being regarded as an important mechanism to improve resident interaction and community development in higher density developments (particularly in larger developments) (Hopkins 2007; Hopkins & Thomas 2002; Meredyth *et al* 2002; Singapore Ministry of National Development 2009). It is important, therefore, that buildings are designed to enable good internet access. It may also be worth considering providing a shared wireless network within a building to share the costs associated with internet access and to facilitate such on-line interaction.

Reach for the Clouds

Between 2001 and 2005, Atherton Gardens, an ethnically diverse high rise public housing estate in Melbourne, was the site of a scheme intended to improve social ties and community spirit through electronic networking. The *Reach for the Clouds* project provided residents with the training, equipment, connectivity and support services they needed to operate a community-managed network. There were several goals:

- to provide opportunities for IT education;
- to provide free IT access to low-income people;
- to enhance communication between groups;
- to provide better access to local and international information and entertainment;
- to promote greater civic participation;
- to improve education and employment prospects; and
- to reduce social isolation and social relations breakdown.

(Hopkins, 2007; Hopkins & Thomas, 2002; Meredyth *et al* 2002)

Provide information and education to residents and encourage mediation of disputes

Living well in greater density entails particular social compromises – consciousness of and consideration for others, negotiation and tolerance of different needs and uses. It is therefore very important that residents in higher density dwellings are aware of the need for such compromises and the impacts that their actions can have on others (Mullholland Research and Consulting 2003: 17-18).

Guidelines or education initiatives promoting neighbourliness, tolerance and consideration could be successful in Australia, especially as many Australians are accustomed to living in detached houses, as compared to other places where neighbour-consciousness is much more easily assumed (Queensland University of Technology 2010, workshop discussion). Such initiatives have been implemented elsewhere.

Heartland Beat

The Singapore Housing and Development Board identified a lack of social cohesion and problems with inconsiderate neighbour behaviour in its housing estates and recently implemented a number of initiatives to improve community and tolerance, with a good neighbour guide as its centrepiece (Singapore Ministry of National Development, 2009; Singapore Housing and Development Board, 2010).

Its online portal *Heartland Beat* can be viewed at the following address:
<http://www.hdb.gov.sg/fi10/fi10333p.nsf/w/CNOverview?OpenDocument>

It contains:

- “Harmonious High Rise Living” – ‘good neighbour’ guidelines, do’s and don’ts and guidelines for handling disputes and nuisances;
- Means for rewarding good behaviour with the “Good Neighbour Award”;
- “Know Your Neighbourhood” – information on shops and town history; and
- “Community Outreach” – information about opportunities to serve the local community and community events;

Similar education resources also exist in Australia, such as the Environmental Protection Agency in Victoria’s publication on neighbour noise issues (see Section 5.2.2 for more information). This is a particularly important resource as one of the major factors relating to noise problems is public awareness of noise and consideration by residents of the interests of others, as well as tolerance (Williamson 1983: 91).

It is also important that residents be informed of by-laws, rights and management and dispute resolution structures *before* they move into a higher density property (workshop discussion), in order to avoid confrontation. This can be achieved by real estate agents, landlords, solicitors and/or property managers being required to provide this information (and being held accountable if they do not). The Queensland University of Technology’s *High-Density Liveability Guide* (2010) suggests that protocols determining acceptable and unacceptable behaviour be set in higher density developments (such as by-laws). These protocols should be displayed publicly and distributed to all residents and signage should be installed in relevant

areas to remind residents of the protocols. In order to ensure they have understood, residents should also be required to sign these upon entering the building (Queensland University of Technology 2010).

The *High-Density Liveability Guide* also suggests that in-house mediation of disputes may also be beneficial, where practical (Queensland University of Technology 2010). In her study of disputes in social housing complexes in Québec, Séguin (1997: 399-400) points out that cultural diversity can lead to significant tension because of different values and lifestyles. She suggests that rather than trying to impose certain rules that everyone agrees with, arbitrational mechanisms to negotiate common living rules and handle conflicts are more effective and may also lead to more understanding between segregated ethnic groups. Such ideas could be implemented in accordance with different models of community mediation. Peper and Spierings (1999) document three experiments in community mediation in the Netherlands, where neighbours on a building or street level may be heard, resolve their own disputes and build relationships.

5.2. Common conflicts

In this section, we focus on two areas where some the most common disputes in higher density developments arise - the use of common property and noise and smell intrusion. Disturbances and conflict between neighbours in regard to these issues can be unintentional, or intentional (although this distinction may be hard to establish in particular cases and often unintentional disturbances can produce tensions or disputes that may lead either or both side(s) to intentionally escalate disruptive behaviour). In either case, the literature indicates that these disputes between neighbours often reflect deeper underlying clashes in lifestyles and expectations between residents.

5.2.1. Use of common areas

All higher density properties include some common areas. These might include corridors, entryways, lobbies, lifts, shared laundries, shared washing lines, parking areas, driveways, waste disposal areas, gardens, courtyards, pools and community rooms. Common areas are very important as spaces that offer opportunities for social exchange and interaction between residents as well as between residents and their friends (Beer 2003). This is especially important since smaller apartments are often not very good spaces for entertainment and entertaining, and public spaces can go some way towards making up for this (Foth & Sanders 2005: 5-6). Common outdoor areas are also particularly important in those developments that do not include private outdoor space (Mulholland Research and Consulting 2003). Indeed, Henderson-Wilson's (2008) cross-tenure study of inner-city high-rise residents in Sydney and Melbourne found that many residents did not have access to outdoor areas to entertain, and considered that this was a contributing factor in their development lacking a strong sense of social connectedness. Conversely, when open spaces were provided, especially containing barbecues, they created a stronger sense of community (Henderson-Wilson 2008).

However, in cases where common areas are provided, and values regarding the appropriate use of these common areas conflict, this can lead to resident disputes. For example, Mulholland Research and Consulting (2003: 14-15), in a study on privacy and density in London, found that diverse household types within a development can exacerbate problems with use of communal spaces, especially as families see communal spaces as play zones, while older singles and couples preferred quiet social space, and younger adults preferred to use them for noisier entertaining. In some cases, this has led to deadlock in residents' associations, with an inability to get all residents to agree over appropriate levels of privacy and freedom. Similarly, in a study of high rise rent-controlled housing in Québec, Séguin (1997: 395) found that tensions existed regarding the use of places of transition between public and private areas (such as entry halls and stairways) by young people, accompanied with concerns over lack of respect for the cleanliness of public spaces by this group. In the NSW context, common causes of disputes over the use of common areas include disputes over parking, drying laundry and conflicts between residential and commercial users of a development.

With regards to parking, disputes can arise where insufficient parking is provided for residents (workshop discussion). In these cases, residents may park in others' parking spaces or in spaces reserved for visitors, leading to disputes (workshop discussion). Problems can also arise where a tenant does not have access to a parking space (for example because their landlord has rented it out separately) and the council refuses to allocate them a street parking permit because the tenants of the development are excluded because their unit already has allocated parking (workshop discussion).

With regards to the drying of laundry, one of the model (standard) by-laws for residential strata schemes in NSW is:

An owner or occupier of a lot must not, except with the prior written approval of the owners corporation, hang any washing, towel, bedding, clothing or other article on any part of the parcel in such a way as to be visible from outside the building other than on any lines provided by the owners corporation for the purpose and there only for a reasonable period (Fair Trading NSW 2009).

The reasoning behind this by-law is that having things hanging from the balconies has a negative impact on the exterior appearance of the building (a common area). However, this has the potential to lead to a number of problems (as recognised by Fair Trading NSW 2009). For example, where an insufficiently large drying area is provided, neighbours must compete to dry their clothes, leading to disputes. In those buildings where common drying areas are not provided, residents have little choice but to use a tumble drier (with resulting environmental and financial costs), or hang their laundry inside their apartments (resulting in a lack of space and amenity in the dwelling). This can be particularly problematic for families with children, who tend to undertake a relatively large volume of clothes washing. Suggested solutions to this problem are to provide residents with sufficient communal outdoor or indoor drying areas, or to provide solutions for drying clothes on the balcony (such as pull-out clothes lines below balcony height) so that they are not visible from the street (workshop discussion). This requires that balcony

balustrades are not made of clear see-through glass. Our workshop participants warned against micro-management of common areas such as clothes lines, because this is not practicable when different households have different lifestyles and are at home at different times.

Regarding mixed-use developments, conflicts can arise between commercial and residential tenants regarding the use of common areas. For example, confusion can arise over rubbish services and facilities being paid for by residents, but used by commercial tenants (workshop discussion).

Another common cause of concern in higher density developments in regard to common areas is wear and tear on common areas and standards of maintenance. The design and image of common spaces, especially those intended for recreation and interaction, is important and therefore their ongoing maintenance to a certain standard is important. It is unlikely that people will want to spend time in places that appear unkempt or unsafe. Ensuring continued funds and responsibility for maintenance of common areas, including green areas are important management considerations (Lilley 2006: 37). However, research undertaken in NSW has found that the appropriate funding of maintenance and repairs in privately owned strata developments can be a cause for significant concern (Easthope *et al* 2009).

Suggestions and solutions

Some suggestions to deal with issues surrounding the use of common property have been covered in this section (above). Further suggestions are included in Section 6.2.4.

5.2.2. Noise intrusion

One of the most prevalent causes of concern amongst higher density residents appears to be noise intrusion (Mulholland Research & Consulting 2003; Peper & Spierings 1999). This has been the subject of numerous recent newspaper articles in NSW (e.g. Thomson, 2009b, 2009c, 2010a; Lam, 2010) and was identified as a major issue by our workshop participants.

There are two main contributing factors to problems regarding noise in higher density environments – building and design quality and resident behaviour. Issues surrounding building design and quality are addressed in Chapter Six. In this section, we focus on the interpersonal aspects of noise and smell penetration in higher density environments.

Beyond design considerations, the extent to which noise intrusion is of concern to residents of higher density developments depends upon the type of noise, the nature of the noise (constant, intermittent, anonymous or identifiable) and when the noise occurs (Queensland University of Technology 2010). Similarly, if a noise is made frequently, then tolerance of neighbours can reduce over time (workshop discussion). The degree to which noise and smell intrusion annoys neighbours also depends upon the routine and tolerance of those neighbours. For example, shift workers are likely to be more bothered by noises during the day and people with

young children are more likely to be bothered by noises in the evening when they are sleeping. Indeed, the sound of an activity such as piano playing can be pleasant to some people and annoying to others and this can change depending on the circumstances (e.g. the quality of the playing, or the time of day) (workshop discussion).

Although differentiating problematic noises from acceptable noises is a complicated exercise, several studies have sought to identify how the type, frequency, duration, intensity, location and timing of noises may influence the degree of annoyance they cause, as well as how different neighbours may be more or less annoyed by the same noises based on other, more personal factors (EPA Victoria 2008b; MORI Social Research Institute 2003; Queensland University of Technology 2010).

Responses to concerns about noise penetration also differ. While some people may complain to neighbours about a noise, others can retaliate to noise issues (or complaints against themselves) by scaling up the noise (e.g. turning up a stereo) (workshop discussion). The degree to which certain noises can be controlled by the residents producing them is just as complex. While it is easy to turn down a stereo or to restrict piano playing to certain times, it is much more difficult to regulate a baby's crying, or the noises made by people suffering from a mental illness or disability.

Indeed, the extent to which noise is a problem within a higher density development has a lot to do with social mix and different lifestyles (workshop discussion). While some people have habits that can reduce noise produced in the home (e.g. taking off shoes while inside), others do not adopt these practices. Given the prevalence of living in detached houses in Australia for the vast majority of the population, until recently, most Australian adults have not grown up being used to the issues of living in higher density, including the need to reduce the sound created in the dwelling for the benefit of neighbours (workshop discussion; Williamson 1983). Another issue relevant to the Australian situation with regards to noise is the impact of the Australian climate on the use of common outdoor areas and balconies, especially for socialising and parties, which can also have implications for noise transfer to the dwellings of neighbours (workshop discussion).

In a follow-up study after a survey on noise in the community in 2007, the EPA Victoria gathered stories about residential noise to better understand its impacts on people's lives. The final report on these stories (EPA Victoria, 2008b) demonstrates many significant effects that residential noise can have, ranging from health impacts to emotional wellbeing, residential satisfaction and even financial costs. It also identified a number of barriers to noise problems being resolved, including reluctance to confront neighbours on the part of some victims, inconsiderate attitudes on the part of some noise makers, and complaints in higher density not being taken seriously or adequately resolved by bodies corporate, landlords and/or local authorities. The EPA resolved that better guidance and promotion in the community and with local authorities could help to address some of these issues (EPA Victoria 2008b). An example of this method is included in the suggestions and solutions section below.

Annoyed by noise?

In 2008, EPA Victoria produced an easy-to-read booklet called *Annoyed by Noise* (EPA Victoria 2008a) to advise people on addressing noise issues in a residential context. The booklet informs residents about things they can do themselves to prevent producing and being bothered by annoying noise, as well as providing information on state law, formal means of mediation and relevant authorities. Sections include:

- “Residential noise and the law”;
- “Tips for talking to your neighbour”; and
- “Tips to reduce noise”.

An electronic version of this document is available at the EPA website:
<http://www.epa.vic.gov.au>.

Suggestions and solutions

Some suggestions of improving design to reduce noise penetration are outlined in section 6.2.3. However, design is only one factor influencing noise penetration. In addressing problems of noise penetration in an Australian situation, it appears that there is a need for more resident awareness and education about some of the things that can be done to reduce noise produced within the home (beyond design considerations of the dwelling). These include sensitivity to the placement of musical instruments (e.g. pianos), speakers and televisions so that these are not placed against a shared wall, not wearing high heels or hard soled shoes on hard indoor floor surfaces, and restricting noisy activities and outdoor activities to certain times of the day. We provide two examples of information campaigns aimed at improving resident awareness of the impact of noise on neighbours below.

Research conducted for the Department for Environment, Food and Rural Affairs (DEFRA) in the UK also focussed on the importance of a targeted public information campaign about neighbour noise to raise awareness and prompt behavioural change (MORI Social Research Institute 2003). The suggested ‘communications strategy’ included four main messages:

- making noise isn’t a right;
- be a good neighbour and think before you make noise;
- complaining informally works best: for noise sufferers and noise makers; and
- formal help is available if you need it (MORI Social Research Institute 2003: 69)

The details of this strategy are outlined in their research report (MORI Social Research Institute 2003) which can be found on the DEFRA website: www.defra.gov.uk.

5.3. Households with specific needs

Sarkissian Associates Planners' (2004) comprehensive review of social issues linked to higher density living identifies 'designing for diversity' as the biggest weakness in the design of Australian medium density housing. It presents insensitivity to the needs of older people, people with disabilities and children as the most persistent problem with this kind of housing, and argues that housing design in general must be more adaptable to the diverse ages, cultural backgrounds and household types of its inhabitants, as well as their changing needs and lifestyles (Sarkissian *et al* 2004: 26, 65). This is an important shortcoming because if the diverse needs of households are accounted for in design and development, social problems are likely to be minimised (Syme *et al* 2005: 2).

There are many different groups who have special needs and lifestyles living in higher density housing in Australia, and there are bound to be many more as urban consolidation accelerates in our cities. Families with children and people with impaired mobility – including older people and people with a disability – are the two major groups referred to in the literature. These will be discussed in depth as examples in this section, but first, we must mention a number of other groups whose specific needs can impact upon residential satisfaction and social issues.

People with pets have particular space and storage needs and may require flexible by-laws and understanding neighbours to maintain household and animal wellbeing and to avoid tensions with neighbours (Bryant & McBride 2004; Henderson-Wilson 2008: 9; Huss 2005; Jackson 1998; Searle, 2004: 43; Thomson 2010b). Home-workers and students may use spaces at different times and frequencies to other people, and may require certain amounts of space and conditions for their activities in the home, increasing the possibility of clashes and conflict on both sides (Sarkissian *et al* 2004: 35-37; Sarkissian *et al* 2003c). Other groups who may want, or need, to use space differently are people with hobbies demanding extra storage for equipment and materials, and certain cultural or religious groups with space uses and needs different from the surrounding majority (Churchman 1999; Sarkissian & Stenberg 2003b; Sarkissian *et al* 2004: 34-34).

5.3.1. Families with children

Apartments are often portrayed as the domain of young singles, young couples and 'empty-nesters' in the mass media, but also amongst property developers and government policy makers. This is especially true in countries that have experienced rapid suburbanisation (especially in Australia, the USA and the UK), with detached houses portrayed as the preferred domain of families with children. Assumptions about the types of people who live in apartments are associated with observations surrounding declining household sizes. As Randolph (2005: 5) notes:

Planners are planning for cities to accommodate singles, couples and the elderly. As far as the planners are concerned, family housing is already over supplied in this new ageing city and needs little encouragement. As a

consequence, contemporary strategic planning has almost become child-blind, with the new higher density centres being built essentially for the childless in mind.

Furthermore, these assumptions are common not only in planning documents, but also amongst developers in Australia. For example, recent work by Fincher (2004: 325) on developers' narratives about the construction of high-rise stock in Central Melbourne found that:

Developers' narratives oppose the suburban 'home' to the high-rise 'lifestyle', consider central city high-rise residences as appropriate only for people without families ... These narratives reiterate the characteristics of an essentialised 'empty nester' or 'young professional' housing consumer, who is envisaged to occupy the new housing and is defined according to life course stage and gender.

Fincher notes that this discourse has serious implications for the provision of services by developers. She argues that by depicting families as living in detached homes in suburbs, developers are not required to provide infrastructure to support families, and instead are seen as "developing housing appropriate to neglected groups" (2004: 335). In a later paper (2007: 631) on the topic she argues that there is:

an inconsistency between [developers'] claims that the housing is socially innovative and their expectations that the choices of housing consumers to live in high-rise housing will conform to longstanding stereotypes. Whilst they claim to be identifying a new group of housing consumers—'empty nesters'—and to be satisfying their needs, in fact the high-rise developers' views of this group are premised on conventional and taken-for-granted views of the relationship between certain life-stages and certain housing forms.

This is a major concern because (as outlined in Chapter Three) families with children comprise a significant sub-sector of the apartment market in NSW. Indeed, Yates (1995: 21) notes that:

While most developers of medium and high density housing will have a particular target market group in mind as they develop their project, reality and the passage of time often mean a cross-section of people live in the development. This is not necessarily bad, although it raises two problems if the project was not developed with children in mind:

- There are not adequate or appropriate spaces/facilities for children;
- The expectations of other residents, and often the rules and regulations of the project, are not child-friendly.

With regards to rules and regulations Sherry (2008) found, in an Australian study, that the legal structure of apartment living can overly regulate family life. She examined the regulatory structure of different forms of multi-ownership in Australia, and presents the case that they regulate occupier behaviour to the extent that families and children may be adversely affected, especially putting at risk children's right to play freely in adequate environments. Indeed, Gleeson (2007) notes that some strata title developments actually legislate against children, for

example by banning their play in common areas. Indeed, Gleeson (2007) has made calls for the outlawing of strata by-laws that ban children from developments of more than ten dwellings. Also, strict living rules and by-laws about household matters such as drying clothes can be restrictive and inappropriate for the demands of caring for children and running a family (Sherry 2008). Further, complaints made by neighbours regarding children's noise within and outside units can produce ugly legal conflicts, regardless of how such behaviour might be seen as normal and expected in a different environment (Sherry 2008).

Restrictions on children's play both indoors and outdoors has been raised as a particular area of concern for children living in higher density properties, with play being seen as essential for a child's development (Beer 2003; Evans *et al* 2006: 435-436; Yates 1995). Indeed, links have been established between quality of play environments and health and social outcomes in later life (Beer 2003). For example, constrained indoor space limits children's ability to undertake certain activities, and also to do activities in pairs or groups (Sarkissian & Kerr 2003). The inability for parents to supervise play is also a problem (Appold & Yuen 2007: 571) in that play is either restricted for example because children are not allowed to play outside unsupervised (Churchman & Ginsberg 1984), or because of safety concerns when children do play unsupervised (Mitchell 1971: 26). Yates (1995) also outlines a number of challenges of different forms of higher density housing for children and youth in regards to play. These include:

- there may no direct outdoors access apart from the balcony, where safety is limited for small children;
- children may require adult help using elevators, upon which they may be reliant to move around;
- supervision of children outdoors may be difficult;
- there can be high degree of noise transmission between units;
- a lack of family-oriented amenities and many amenities are off limits to children and teens; and
- low availability of land on which to play.

(For recent and comprehensive discussion of the independent mobility of children living in apartments in the Australian context, refer to Whitzman & Mizrachi 2009.)

There are a number of simple design solutions that can enable children's play in higher density environments. These include enabling direct surveillance of play areas by adults (Yates 1995) either when the adults are inside and the children outside, or providing outdoor play spaces with areas for parents to sit and socialise (Fuerst & Petty 1991: 128). There are also important design considerations regarding the safety of children, including the design and construction of balcony balustrades and windows (to prevent falls) and appropriate lighting and surveillance (both passive and active).

With regards to appropriate spaces and facilities, crowding and a resulting lack of privacy leading to emotional stress and strained family relationships has been identified as a particular problem for children in higher density dwellings (Appold & Yuen 2007: 571; Evans 2006: 429-430; Sarkissian & Kerr 2003).

According to Gifford (2007), the international literature establishes that households containing children are generally dissatisfied with high-rise living, and that high-rise dwellings are unsuitable for the development and play needs of children, especially of small children. However, Fuerst and Petty (1991) question the assumption that high rise contributes to social problems such as crime and family dysfunction amongst low-income families, pointing the finger at resident profiles rather than high-rise design itself. They identify a number of successful high rise public housing projects in the United States to back up their claims (Fuerst & Petty 1991). One issue they do identify is the problem of too many, and too large, families in the one building, which can be encouraged by the provision of many larger apartments (Fuerst & Petty 1991: 126-27)

Design considerations in regard to families with children also need to take into account the diversity of ‘families with children’ households, and the very different needs of children of different ages, “especially if housing is to accommodate them as they progress through different stages in the life cycle and thus have different needs” (Fincher 2007: 645-47). As Randolph (2006:486) states:

Increasing the attraction of these areas for children also means the provision of appropriate safe spaces for play and recreation areas – and not just playgrounds for pre-schoolers. Over the longer term, children become teenagers.

Also, as Troy (1996: 155-160) notes, family living arrangements may fluctuate across time as, for example, children return to live with their parents temporarily. Higher density developments therefore ideally need to be able to be adaptable for such possibilities. Indeed, design flexibility is very important for families with children living in apartments (Fuerst & Petty 1991: 128). This has led some commentators to promote a universal design approach in apartment developments to allow spaces, storage and passageways to suit people of different ages and abilities and to change in function as family needs change across time (Yates 1995).

The quality and durability of the building are also important considerations for families with children. In reporting on research undertaken on child friendly medium and high density housing in British Columbia (Canada), Yates (1995: 29) notes:

One of the most frequent comments made by families about their current housing was that everything is built to minimum standards, and does not stand up to the normal use of children. The comment was made about doors and hinges, paint and stucco, carpets and floor coverings. Children are active and can be hard on materials.

Certainly, many of the design solutions proposed in the existing literature to improve the lives of children living in apartments that are proposed in the existing literature are not design solutions focused solely on children, but rather designs that are flexible and adaptable to a broad spectrum of different household types and resident needs and a higher quality and durability of materials that would be beneficial to all residents.

Suggestions and solutions

In addition to the suggestions provided above, there have been many solutions proposed in the international literature to make higher density housing more responsive to the needs of children. These include the following design considerations:

- The provision of community rooms (Fuerst & Petty 1991: 128) and both indoor and outdoor spaces where children can play to give them a place to go in wet weather (Yates, 1995).
- Better landscape outdoor play space with areas for parents to sit and socialise (Fuerst & Petty 1991: 128) and provide different types of outdoor spaces at different scales, with as many natural features as possible to foster varied, imaginative play (Yates, 1995).
- Good lighting and security (Fuerst & Petty 1991: 128).
- Direct surveillance of play areas by adults should be possible (Yates 1995).
- Design variability and flexibility to reduce uniformity of different units (Fuerst & Petty 1991: 128).
- Clustering family-oriented units together, with ground floor access (Yates 1995).
- Adoption of a universal design approach (discussed in more detail in sections 5.2.2 and 6.1.1), to accommodate changing household needs whereby spaces, facilities, storage, amenities and passageways are designed with seniors, strollers, disabilities and children in mind (Yates 1995).

For further and more detailed design solutions, see Cooper-Marcus and Sarkissian (1986), Sarkissian and Kerr (2003) and Sarkissian *et al* (2003a and 2003b).

Yates (1995) also suggests a number of social measures to improve the wellbeing of children and their communities at higher densities. He suggests that in attempting to improve the experience of higher density living among children and young people, it is important to consult them directly, for example through a youth committee. It may also be valuable to specify children's rights in a positive way in rental/sales agreements and condominium rules (e.g. "sharing" with children). It is also important that residents are conscious of the different needs of children, youth and older people. He also recommends:

- building a culture of tolerance of children's needs and behaviours;
- involving children in decision-making about a development and their use of it; and
- teaching children to respect others' needs and privacy (Yates, 1995).

5.3.2. People with impaired mobility

Many limitations related to physical and mental health can affect the needs of higher density residents with regard to their dwelling and development, as well as their use of and satisfaction with their dwelling (Bleasdale 2007). Our second example of the impact of specific needs on quality of life in higher density housing relates specifically to people with impaired mobility, notably older people and

people with a disability. While not all older people have a disability or other mobility impairments, and while not all people with a disability are older, disability and age often coincide. Impaired mobility may also coincide with a lower income, due to restricted employment opportunities (Beer 2003; Bleasdale 2007: 45; Quinn *et al* 2009: 26-28; Sarkissian *et al* 2004: 23).

Higher density housing, when designed appropriately, can be very suitable for people with mobility problems due to lower costs and maintenance, security and convenience (Sarkissian *et al* 2004: 23). However, the housing needs of these people have rarely been accommodated in multi-unit housing in Australia (Sarkissian *et al* 2004). While most older people and people with a disability live and/or prefer to live in 'regular' housing (i.e. not supported accommodation), no existing national accessibility regulation has meant that there is a considerable lack of housing stock that is suitably designed or already modified for people with impaired mobility, such as people in a wheelchair (Bleasdale 2007: 29-30; Sarkissian *et al* 2004: 32-33). This means that modifications must be applied to existing dwellings, as there has been a lack of attention to accessible design principles in medium and high density development (Bleasdale 2007; Sarkissian *et al* 2004).

Despite beliefs that the principles of accessible design need not be applied across the board because they serve only a small proportion of the population and involve higher costs (Bleasdale 2007), it appears that the financial cost of ignoring these principles and needing to later retrofit may be just as significant, and the delay may increase risks for people with mobility problems and reduce their independence (Bleasdale 2007; Judd *et al* 2010; Sarkissian *et al* 2004). This may be particularly problematic in an ageing population, especially when health or circumstances can change unexpectedly (Bleasdale 2007; Sarkissian *et al* 2004). The associated issue of social segregation of people with reduced mobility has also been raised by Bleasdale (2007).

Sarkissian Associates Planners observed that many higher density developments in Australia had many features that may directly counteract the wellbeing of people with mobility impairments, including inaccessible entries, a lack of comfortable seating in common outdoor spaces, steep and uneven walking surfaces and poor lighting (Sarkissian *et al* 2004: 31-34). An additional factor they identified is that people with mobility problems may spend more time at home than other residents, and therefore they may be particularly vulnerable to the impacts of design deficiencies at unit and development level (Sarkissian *et al* 2004).

Suggestions and solutions

Some of the major needs identified in the literature for people with reduced mobility in higher density living include:

- Adaptable storage and layout. Spacious, flexibly designed rooms and storage can enable modifications which can enhance independence, decrease the risk of injury, facilitate daily living and provide a sense of wellbeing and control (Danziger & Chaudhury 2009; Dunn 1990; Sarkissian *et al* 2004).

- Accessible and easy-to-use furnishings and fixtures. Sliding doors, easy-to-use and reach switches, cupboards, sinks and knobs can increase independence, satisfaction and safety in the home (Danziger & Chaudhury 2009; Sarkissian et al 2003b).
- Living space for temporary residents and/or carers. This may mean extra bedrooms for small households, which may inaccurately appear to be underutilisation of space (Sarkissian et al 2004; Judd et al 2010).
- Accessible, well-designed entries and passageways. Wide corridors and doorways can facilitate movement around the dwelling and development and prevent risk of injury, and stair accidents can be avoided by eliminating their use or improving their design (Jung & Bridge 2009; Sarkissian et al 2003b; Sarkissian et al 2004).
- Accessible and reserved disabled car parking. Larger car spaces and level, easy access to and from the building can enable people with decreased mobility to access their housing more effectively (Danziger & Chaudhury 2009; Stone 2007: 705-06).
- Accessible, well-designed outdoor space. Appropriate design and location of gates, seating and common spaces, especially 'green' outdoor spaces can help people with limited mobility to effectively participate in the health and social benefits of nature (Beer 2003; Sarkissian & Stenberg 2003a).

Sarkissian *et al* (2003b) and Sarkissian and Stenberg (2003a) provide extremely detailed accounts of these and more considerations when designing for older people and people with a disability in higher housing density. Most of the features listed are standard inclusions on lists representing principles of Universal Design, Adaptable Design, Accessible Design or Visitable Design, which are different approaches to improve housing access and safety for people of diverse abilities (for a fuller explanation and a comparison of these methods, see Quinn *et al* 2009: 6, 81-113).

A number of good international resources are available online for designing to meet the needs of people with impaired mobility in particular or for implementing inclusive design in general. These include:

- *Lifetime Homes* - www.lifetimehomes.org.uk (UK)
- Provides information and resources for professionals and residents on ways of making homes more inclusive and accessible. Includes 16 design criteria, briefly stated and explained.
- *Inclusive design toolkit* – <http://www-edc.eng.cam.ac.uk/betterdesign> (UK)
- An academic resource that defines, justifies and documents the implementation of inclusive design. Includes interactive resources such as impairment simulators.
- *IDeA: Center for Inclusive Design and Environmental Access* - <http://www.ap.buffalo.edu/idea/Home/index.asp> (USA)
- Information about Universal Design, including design resources, publications and multimedia.

6. Design

In the previous section we discussed some of the implications of living in close proximity to neighbours. In this section we focus on the impact of the design of a building and/or development on the experience of higher density living.

The first part of this section addresses how design quality relates to people's needs and expectations of space at the level of the household. The second section considers design considerations at the building or development level. Throughout the chapter we discuss how good design can both reduce the likelihood of problems and promote positive outcomes, such as social interaction, and provide some examples of potential design solutions to this end.

In 2004, Sarkissian Associates Planners identified a number of persistent problems inherent in Australian medium and high density developments in Australia. They asserted that these problems persisted despite large volumes of literature on such issues and possible design solutions. One of the main problems identified related to the incompatibility of space with the specific requirements of certain household types (older people, children and people with mobility impairments), which was discussed in the previous chapter. The remaining key problems they identified can be categorised as: a lack of attention to the impact of the appearance of developments and a lack of attention to the location, form and design of open space, both public and private. They linked these issues directly to resident satisfaction and the potential for success in changing attitudes towards higher density housing in the community and the housing market (Sarkissian *et al* 2004: 25-26).

We do not attempt to address all of the design issues that can arise in higher density dwellings and developments in this chapter. Rather, we focus on a few of those issues that were raised most frequently in the literature and by workshop participants.

6.1. Household level

In this section we consider some of the key design issues at the level of the household. We begin with a discussion of the importance of the design of the interior space and layout of a dwelling, including storage, before considering the design of private open space. Finally, we discuss the issues of light, ventilation and thermal comfort in higher density dwellings.

6.1.1. Interior space, layout and storage

The quantity, quality and design of interior space and storage are common causes of resident dissatisfaction in medium and high density housing in Australia and elsewhere (Bretherton & Pleace 2008; Chan 1999; Lilley, 2006: 86-87; Sarkissian *et al* 2004: 51-53; Steidl 1981: 308). Resident complaints raised in the literature appear to reflect a lack of foresight on the behalf of designers and developers about the amount of space and storage required for day-to-day living. Often there is

insufficient kitchen bench space, insufficient or inadequate space to store cleaning supplies and vacuum cleaners, or baths and sinks designed for aesthetic value that do not suit common uses of these spaces (Hofer 2008: 74-75, 143-44; Lilley 2006: 86-87; Sarkissian *et al* 2004: 51-53; Steidl 1981: 308).

Again, problems regarding adequacy of space and storage associated with higher density housing is particularly likely to disadvantage low-income groups, and therefore adversely affect social equity (Burton 2000: 1974, 1983-1984). For example, a London study found that some families in cheaper private sector housing and social housing complained of insufficient living space for three reasons: living spaces (bedrooms, kitchens, etc.) were too small for daily living and required furniture and equipment such as washing machines; there was not enough storage for items needed for children and babies; overflowing storage to the garage often at the expense of keeping a car there; and there was not enough separation of adults' space from children's space, especially in open-plan interiors (Mulholland Research and Consulting 2003). Furthermore, renters in apartments were disadvantaged in addressing these problems as compared to owner-occupiers in semi-detached housing, since the latter could extend their homes outwards or upwards (Mulholland Research and Consulting 2003).

Similarly, the findings of a post-occupancy evaluation of the Canadian mixed-tenure housing estate of False Creek North confirmed that many residents were unhappy about the space, layout and in-suite storage of their units. Inflexible unit design and unconventional design due to targeting rare niche markets were major causes of dissatisfaction (Hofer 2008: 74-75, 144). Sarkissian Associates Planners emphasised that while some design innovations might be designed for niche markets, considering the heterogeneity of the Australian population, no design feature should be included that would make predictable behaviour difficult (Sarkissian *et al* 2004: 51-52).

Interestingly, two studies in the United Kingdom have pointed to problems associated with open plan living. A study of eight higher density mixed tenure developments in the UK found that open plan kitchens, though well regarded for the feeling of increased space they produced, caused a number of other problems. These included noise penetration to other rooms (so, for example, it was too noisy to watch television in the living room when the dishwasher was running in the attached kitchen) and difficulty in fitting furniture such as dining tables and heaters because of awkwardly shaped and designed spaces (Bretherton & Pleace 2008: 38). Another study in the UK in 2003 reported that open plan living and dining areas were unpopular with larger families unless additional private rooms were available. Open-plan design was reported as inadequate as a method of improving meagre dimensions, especially when households have three or more occupants, as it can lead to claustrophobia and lack of internal privacy (Gentoo Group 2006).

A study of renters in multifamily housing in the USA (James 2007b) displays in more depth the importance of separated space or zones within multifamily housing, and that this is sometimes the problem, rather than actual floor space. James suggests that including design features such as additional rooms or balconies are likely to assist residents in separating themselves from other occupants of the same home, and may improve resident satisfaction. Similarly, Evans *et al* (1996) report

that a greater degree of physical separation between private and less private rooms may produce better social outcomes at the household level, especially in share households consisting of non-family members.

Certainly, size, space, storage and layout can have a number of ongoing effects for households (Gentoo Group 2006). For example, Steidl (1981), reporting on quality findings on apartments in the USA with regard to their usage, found that the size, shape and design of spaces within higher density dwellings could greatly impact upon the effort involved in even mundane tasks, like welcoming a guest or preparing a meal. Stiedl (1981) linked this increased effort to decreased satisfaction with apartments. In a 2004 survey of inner city Melbourne apartment dwellers, the second most important reason for people potentially moving from their current dwelling was due to the need for more space (Metropolis Research 2005: 81). In another study of apartment residents in Canada, Hofer (2008: 81) found a strong relationship “between overall unit layout satisfaction and length of intended future residency” and households who were satisfied with the layout of their unit were much more likely to stay for three years or more.

Importantly, it is not simply satisfaction and general quality of life that may be affected by the size, design and layout of indoor space, but also health and safety. Children are especially vulnerable to falls and other accidental injuries within the home (Breysse *et al* 2004: 1586). A review of healthy housing studies in Europe identified unintentional home injuries as a serious public health problem, greater in human and financial cost than road accidents (Bonney *et al* 2004). Above and beyond risky human behaviour, certain structural features may increase the likelihood and/or severity of accidents in the home. They suggest that dissatisfaction with dwelling size, space and layout and dissatisfaction with temperature and lighting may be associated with an increasing likelihood of accidents (Bonney *et al* 2004: 5-6, 14). A New Zealand study found that structural defects, poor design and poor maintenance can also be linked to children’s unintentional injuries within the home, for example, where access is not barred to certain areas or where lighting is insufficient (James 2007a: 21).

Suggestions and solutions

Adaptable and universal design

As discussed in the previous chapter, spaces that facilitates mobility, accessible storage and other design features enabling easy access to and within the dwelling are especially important for children and people with limited mobility.

Design should respond to the predictable activities of households at different stages in the life cycle. Where these predictable activities may differ, such as between different cultural groups, they should be consulted so that the housing suits the expectations of the occupants (Sarkissian *et al* 2004: 50-52). Universal Design principles have recently come to the fore as an approach to improving quality of life for people of all ages and abilities (see 5.2.2 for more information).

Providing sufficient living and storage space

All residents require adequately sized, designed and located storage space, especially older people who have accumulated many possessions (Sarkissian *et al* 2004: 50-52). Design of higher density dwellings should take into account predictable storage needs, such as the provision of reasonably large kitchen cupboards, space for whitegoods and a cupboard that would fit a vacuum cleaner. Simple, easily available information for residents and industry professionals exists (see below) and, when consulted, could better ensure reasonable space and storage provisions.

There are a number of useful online resources with extensive information on how to design space and storage to suit occupants. These include:

- *Delivering Successful Higher Density Housing* (UK) - www.east-thames.co.uk/highdensity/index.asp
- *Your Home Technical Manual* (Australia) - www.yourhome.gov.au/technical/index.html
- *Design Principles* (Queensland) - www.housing.qld.gov.au/design/standards/index.htm
- *Guidelines for Higher Density Residential Development, Element 5: Building Layout and Design* (Victoria) - [www.dse.vic.gov.au/CA256F310024B628/0/E1D34293A9CDA692CA257070001C40CC/\\$File/Guidelines+for+Higher+Density+Residential+Development+3.pdf](http://www.dse.vic.gov.au/CA256F310024B628/0/E1D34293A9CDA692CA257070001C40CC/$File/Guidelines+for+Higher+Density+Residential+Development+3.pdf)

One particular salient example of an dynamic, useful online resource is Gentoo Group's "Swing a Cat" informational website (UK) - <http://www.swingacat.info/index.php> - which provides specific advice about things to consider when seeking a home, and gives examples of how room numbers, room size and amount and design of storage may affect quality of life.

Promote resident privacy

Mulholland Research and Consulting's report on privacy (2003) makes a number of recommendations to the UK Government regarding interior space, layout and storage. These include positioning rooms so that sensitive spaces do not adjoin party walls (e.g. a bedroom does not adjoin a neighbour's bathroom) and that private zones for different family members be included (Mulholland Research and Consulting 2003: 10).

Design for the feeling of more space

Regardless of actual floor space, certain design features can be employed to increase perceived and usable indoor space, for example, by creating higher ceilings, by making storage more efficient, by improving layout and by increasing lighting and ventilation (Sarkissian *et al* 2004: 51-53).

Enable residents to personalise space

Sarkissian Associates Planners stress the importance of following simple design principles and including features that allow the house to really function as a 'home'.

They specify that the design of medium and high density housing should be flexible enough encourage residents to personalise their space via modifications and furnishings to suit their unique needs and tastes. This was considered especially important for people with children and people with mobility impairments (Sarkissian *et al* 2004: 49-50).

Being able to personalise space and have a sense of control over space is important psychologically, as well as to meet the concrete needs of households for space and storage. A review of the research on housing and health for the World Health Organization in 2004 identified the ability to personalise a space as an important factor in creating a sense of self and identity, and in having a sense of control over the environment (Bonney *et al* 2004: 4). Cooper-Marcus and Sarkissian (1986) also highlight the importance of being able to personalise the interior and exterior of one's dwelling in mass housing, partly to reflect household personalities and partly to accommodate households as needs change. They stipulate a number of design features that can help to demarcate and differentiate one property from another (Cooper-Marcus & Sarkissian 1986: 63-673).

6.1.2. Private open space

A London study found that almost all respondents across household types said that private open space – regardless of form or size – was very important for sun exposure, private outdoor activity and entertainment (Mulholland Research and Consulting 2003: 12). There are various forms that private open space can take, and its design should reflect occupant needs and the surrounding environment and climate (Cooper-Marcus & Sarkissian 1986: 95-106). In the context of higher density developments, this might be a private balcony, patio, garden or courtyard attached to each individual dwelling. The provision, quantity and quality of this private open space are important factors affecting residential satisfaction.

For example, data on rented multifamily units from the 2005 American Housing Survey (James 2007b) showed that, while the number of rooms and total unit floor area were positively correlated with resident satisfaction, whether units had private open space such as a balcony or patio was a particularly significant contributor, in part because it added to the ability of occupants to separate themselves from others within the unit (as discussed above). Similarly, a 2003 study by Design for Homes in the UK found that residents from ten social housing schemes valued private outdoor space very highly, and the report therefore recommended that private open space be included as a fundamental component in apartment or townhouse complexes (Gentoo Group 2006).

In the Australian context, a 2004 survey of Melbourne inner city apartment residents (Metropolis Research 2005) found that around half of the households surveyed indicated that their dwelling included a private balcony, however over one fifth of households claimed to have no private open space at all. Only one quarter of respondents were satisfied with their allotment of private open space, with almost half desiring that it be larger. However, there was also a significant portion of people who valued greater living space and storage space above private open space (Metropolis Research 2005: 152-55). In a recent study of Brisbane high-density

residents, most respondents had a balcony and most considered it a very important feature, many even their favourite feature (Buys *et al* 2008). The researchers largely attributed this finding to Brisbane's climate.

Historically, balconies in higher density housing in Australia have often been too small, and poorly designed, reflecting little understanding of their social importance (Sarkissian *et al* 2004: 55-56) and leaving little space to use and move around the balcony (Buys *et al* 2008; Cooper-Marcus & Sarkissian 1986: 105; Sarkissian *et al* 2004: 55-56).

Materials used for balcony balustrades also affect resident satisfaction, with many residents preferring clear materials such as glass so that their view and light intake from within their apartment are maximised (Hofer 2008: 145; Sarkissian *et al* 2004: 55-56). However, balconies on which resident activity can be viewed by neighbours or passers-by due to clear balustrades (or being on a lower level) may make occupants feel uncomfortable using this space due to a lack of privacy (workshop discussion). The Popular Housing Group's report into consumer privacy in the United Kingdom found that most residents wanted their private open space to be very private, and if structures to ensure this were not available, they often reinforced existing barriers or used vegetation for the desired effect. Only a minority of participants viewed this open space as a means of communicating with neighbours (Mulholland Research and Consulting 2003). Balconies overlooking the private open spaces of other residents may also cause tension and discomfort for both parties. Design responses to increase privacy should therefore be carefully considered in higher density design (Cooper-Marcus & Sarkissian 1986: 98-100).

Access to a garden is also important for some groups living in higher density housing (workshop discussion). For example, Troy (1996: 160) stressed the importance of continuity for older people who have been used to having a garden when living in a detached house in having access to a garden when they move into a higher density dwelling, for the sake of their continued health. Importantly, as is the case for interior space, Burton (2000: 1974) suggests that low-income groups in particular may miss out on private open space.

Suggestions and solutions

Each dwelling in a development should include some private open space – such as a terrace or balcony - ideally with a northerly aspect. Balconies should be deep enough for a group to use and promote privacy through the use of non-transparent balustrades (Queensland University of Technology 2010).

Mulholland Research and Consulting (2003: 23-24) makes a number of recommendations regarding private outdoor space, including:

- placing private open spaces within good access to sunlight and away from traffic fumes, street noise and public view where possible;
- screening private open space with walls, fences, foliage or landscaping (for ground-level spaces) or canopies, walls, railings or plants (for balconies); and
- focussing on quality, not quantity, of private open space.

6.1.3. Light, ventilation and thermal comfort

Some typical design elements of higher density housing can limit the natural sunlight available to some or all units, which may adversely affect energy efficiency and resulting costs (both financial and environmental) as well as reducing the flexibility occupants have in using their indoor space. For example, an occupant may require central heating and electric lighting more frequently than otherwise, and activities may be confined to the lounge room during the day, if that is where the majority of the natural light is available. Inadequate ventilation, or unit design that does not suit the ventilation needed for the surrounding climate, can also be a cause of discomfort and may also compromise personal safety if, for example, doors and windows need to be left open at night in hot climates. Units that are poorly designed may either trap unwanted heat or cause heat to escape, both of which limit the value of natural ventilation and increase energy demands and the risks of social and health problems (Bretherton & Pleace 2008: 36-37; Buys *et al* 2008; Hofer 2008: 146; Ng 2010: 119-136; Sarkissian *et al* 2004: 53-54).

The orientation of individual units in a medium or high density development is also important with regard to heating, light and ventilation. An overdependence on air conditioning and assumptions by high-rise developers of its necessity may adversely affect the natural environment, reduce housing affordability, and place a cost burden on residents. The latter two factors particularly affect low-income residents, who may also be less likely to achieve thermal comfort in their homes. Our workshop participants noted that lower income households living in older buildings, which are hard to retrofit and have poor ventilation and orientation, force many to use air conditioning even when it is not an affordable option. Energy efficiency is therefore important, and unit design can allow for this by maximising natural light and ventilation (Buys *et al* 2008; James 2007a: 11-12; Sarkissian *et al* 2004: 53-54). Natural light is also important because of its association with a feeling of having more open space and of aesthetic satisfaction within a dwelling (Queensland University of Technology 2010).

Higher density residents may use a number of strategies to regulate the temperature and airflow within their dwelling for their own comfort. Design features can facilitate or complicate this process, impacting residential satisfaction and energy efficiency and contributing to social issues. Buys *et al* (2008) investigated the social impacts of high-density living related to thermal comfort within individual dwellings, focusing on residents in the sub-tropical climate of Brisbane. They state that climatic considerations are often overlooked in the literature about high-density living and residential satisfaction. Most of their research participants preferred natural air-flow to using air-conditioning, and some did not use an already installed unit. The exception was in cases where traffic noise and pollution were particularly prevalent. Interviewed residents highlighted balconies and outdoor living areas and dwelling orientation and modifications, such as sun shades, as design features that affected their experience of climate. Our workshop participants pointed out that mould and condensation also result from poor ventilation, as well as noise transmission, through the necessity of leaving doors and windows open.

Suggestions and solutions

Participants in our workshop discussion suggested the following with regard to solutions:

- installing louvres or casement windows to regulate ventilation;
- embracing some elements of older design, such as thick walls, windows on 2-3 sides, higher ceilings and cross ventilation;
- installing roof gardens or vertical gardens (hung off the wall or extended from the balcony) on new buildings to cut down the heat load; and
- installing air vents in the wall which ventilate without needing to open the windows.

The Queensland University of Technology's project and accompanying website "High-Density Liveability Guide" (2010) outlines the major determinants of thermal comfort and adequate natural light, justifying good design in these areas in relation to physical and psychological health and reduced economic and environmental costs. They suggest a number of solutions that can be undertaken by developers, residents and managers to ensure improved thermal comfort and natural light, including:

- orienting living spaces to make the most of passive heating and cooling;
- applying external shading in the form of adjustable screens and awnings to guard interiors from excessive heat and to balance conditions throughout the year;
- building with materials with high thermal mass to keep down internal temperatures and materials such as polycarbonate for skylights and balustrades, which admits sunlight while preventing excessive heat;
- providing space for large trees in the site plan to optimise natural breeze and shade and adequately managing and maintaining them;
- attaching private outdoor space, such as a balcony or terrace, to each dwelling, maximising northerly aspect and opening living areas to natural light and airflow;
- installing ceiling fans and compatible ceiling heights, and promote their use instead of air conditioners; and
- educating occupants about controlling the climate of their dwelling in sustainable ways.

Artkins (2007) stresses that where innovative design solutions are incorporated into buildings to enhance thermal comfort and environmental sustainability, it is especially important to ensure that users are educated about the benefits of the system and how to use it effectively. Otherwise, desired outcomes may not be achieved.

6.2. Building or development level

Design at a building or development level is just as significant as design at unit level. In this section we first discuss issues surrounding the quality of the design

and construction of higher density housing, before focusing on three issues that were identified as particularly significant in our workshop discussion, as well as in the literature – the external appearance of the building(s), penetration of noise and smells and the design of common areas.

6.2.1. Design and building quality

The workshop participants identified design and building quality as a particularly problematic in higher density developments in NSW. With regards to building quality, our workshop participants suggested that Australian higher density housing is often built without taking account the long-term endurance and ongoing repair and maintenance costs of a building. As a result, modern dwellings can very quickly rack up enormous repair costs, often leading to complex disputes between owners.

Building defects in higher density developments are associated with significant financial and social costs, as well as health costs (James 2007a: 10). A study of owners and managers in residential strata schemes in NSW reported building defects as producing a raft of problems in high rise living that are often difficult and expensive to resolve (Easthope *et al* 2009). Common building defects in NSW strata dwellings include external and internal water leaks, defective lifts and air conditioning, defective or dangerous balconies, electrical faults, structural cracking and poor fire and safety compliance (Easthope *et al* 2009). These defects can have many implications for occupants with regard to health and safety, residential satisfaction, relationships with neighbours and management, and the cost of repairs.

Design faults and deficiencies have also been shown to have a human impact in social housing in Europe, especially where stock is old and where maintenance costs are passed in part or in whole to tenants and owners without the incentive or disposable to contribute (Turkington, van Kempen and Wassenberg (eds) 2004). Indeed, in NSW, older schemes with long term residents paying low levies have begun to suffer problems, especially along the coast (where they are particularly susceptible to concrete cancer and sporing due to moist salty sea air) (workshop discussion). Where these schemes have a high population of older retirees, they may in fact be unable to fund the required repairs and maintenance, resulting in increasingly run down and unsafe living environments.

The problems are not limited to older buildings, and extensive repair costs in the first few years of newly erected buildings (which suffer from defects or have not been designed or costed for ongoing upkeep) create more than just physical and financial issues. They also often produce complex disputes over funds and responsibilities (workshop discussion, Easthope *et al* 2009). For example, Lister (2006) reported on the experiences of young people in the English private rental sector and noted that poor management and maintenance often continued unrectified due to an imbalance of power and knowledge between tenants and landlords, and that this resulted in threats to tenants' health, safety and wellbeing, including mental stress and frustration from inadequate conditions, vermin infestation, unsafe electrical and gas appliances and general disturbance of space usage.

With regards to design quality, there was some discussion during the workshop about the relative incentives provided to private developers and social housing developers to undertake innovative designs. While social housing allows certain innovations and design features to be standardised, the private sector is much harder to regulate for this kind of innovation. Similarly, private developers often have less motivation than social housing developers to be innovative in design in regards to reducing ongoing management and maintenance costs, because while the social housing provider is likely to also manage the developments in the longer term, the private developer's primary concern may be making a short-term profit. However, even within the social housing sector, there was some criticism of the limited possibilities afforded to public housing tenants to have some input into the design of new public housing properties (workshop discussion), especially given the recent rush by the Department of Housing to spend funding provided to it under the Australian Federal Government's Economic Stimulus Plan (Australian Government 2010).

Suggestions and solutions

Take building life-cycle and operating costs into consideration at design and construction

The workshop participants suggested that developers ensure that building design accommodates for necessary ongoing costs for maintenance and repairs. They also suggested that developers be required to produce and publish compulsory levies to meet sinking fund assessments at the registration of the scheme, to be audited, with the developer in danger of losing their licence or be hit with penalties if they do not comply. This would enable dwelling prices including maintenance costs to be compared more realistically across the market (workshop discussion).

Encourage understanding and discussion between architects and residents

The workshop participants suggested that architects need to bring with them an understanding of the experiences of high density living in order to design these properties appropriately. Beyond having personal experiences of living in higher density, architects to gain such an understanding by being briefed by tenant feedback about what does and does not work in higher density developments. It was also suggested that mechanisms should be created to enable architects and designers to work alongside advocacy bodies to brainstorm and produce innovative solutions for meeting social and design objectives.

Provide continuing education and information to architects, developers and builders

Design for Homes in the UK offer free online course units (Design for Homes 2010) which demonstrate the potential for continuing professional development to be available to operators in the industry.

6.2.2. External appearance

The external image and appearance of higher density developments was raised as an important issue both in the international literature and at the workshop discussion. Indeed, Bretherton and Pleace (2008: 34) found that exterior architectural design was as important a factor as interior unit design in resident choice and satisfaction. This extends beyond the building(s) themselves to spaces of transition between the home and the public street, which have been shown to strongly influence the feelings that residents have about their home. Poorly designed common spaces can have a cumulative effect whereby residents do not have pride in their home, and therefore a sense of belonging and community are less likely to develop (Beer 2003).

The style and design of higher density developments, especially high-rise buildings, can cause much controversy. This is especially true where developments are innovative or fashionable to target specific markets, where developments are located in traditionally lower density neighbourhoods, or where design trends and cost saving lead developers to standardise dwelling design so that there is little differentiation between units (Lilley 2006: 33, 86; Sarkissian *et al* 2004: 39-40).

Values, ideology and symbolism are strongly associated with architectural style, and relate also to image and identity for individuals and communities. Appold and Yuen (2007: 570) recognise that modernist high rise housing may be embraced or rejected for what it represents, rather than simply for its pragmatic qualities. Indeed, in a number of countries, high density housing has had an image problem – tower blocks with social problems are one of the first associations that come to mind for many – with negative connotations stemming from historical characteristics of high rise blocks (Appold & Yuen 2007: 570; Bretherton & Pleace 2008: 9; Syme *et al* 2005: 3). This is certainly the case in Australia, but is not necessarily universal. For example, high rise housing is most often seen in a positive light in Singapore (Yuen 2005). Along with urban consolidation, design specifications, demand and building style have changed over recent decades and years, resulting in a changing image of higher density housing in this country (Costello 2005; Yuen *et al* 2006: 585). For example, Costello (2005) documents the changing images of high-rise living in Melbourne, from being associated with poverty and disadvantaged to being associated with wealth and niche markets for emerging lifestyle groups such as empty-nesters.

However, many public housing estates continue to attract negative associations and stigma, which can have an adverse effect on residents. Indeed, Arthurson (2001) equates the physical image of housing with social justice in regard to public housing, and the lack of resident involvement in design. Our workshop participants spoke about the effect of poor housing design on self image, explaining that housing which does not have a good external appearance can be associated with assumptions about the ‘worth’ of the tenants to broader society.

However, sometimes housing estates that have been perceived by outsiders in negative terms may be represented quite differently in residents’ experience, for whom they are home (Arthurson 2001: 814-17). Indeed, regeneration programs and activities aimed at creating social networks are two main ways to reverse some of this stigma (Henderson-Wilson 2008). Certainly, people’s perceptions of their

dwellings in relation to their ideals of 'home' extend well beyond design quality and architectural style (Bretherton & Pleace 2008). There has been considerable research into the meaning of 'home' and the evident emotional, cultural and psychological factors that are at play in these definitions (Easthope 2004).

In Australia, there is a move away from mass production of easily identifiable social housing (workshop discussion). In the UK, Bretherton and Pleace (2008) found that many residents in eight new schemes felt that affordable higher density developments allowed them to have better quality dwellings than they could have had otherwise and that a significant number of their respondents viewed innovative architectural designs positively, especially because of the space and light often associated with the modern design. In the private property market, design guides and building specifications are also being implemented by different levels of government to control to some extent the aesthetic quality of higher density designs (such as SEPP 65 'Design Quality of Residential Flat Development' in NSW).

Our workshop participants discussed the importance of the 'beauty' and 'mystery' of home environments, especially for children. Such 'mystery' can be achieved through having building facades that are not standardised and including trees in the development. Bretherton and Pleace (2008: 35-36) also note that where buildings have an open space at the front (rather than a street frontage) and where the block layout is curved, rather than symmetrical, this can reduce feelings of crowding in higher density dwellings. Children also have need of design features that help them to orient themselves and identify their home, even at a young age (Yates 1995). They also require safe routes and play areas, segregated from traffic.

Suggestions and solutions

Yates (1995) says it is possible to encourage the creation of a sense of community through the design of a development. For example, he recommends that individual dwellings within a development be made visually distinct in their design elements, materials or landscaping, that units be grouped in small clusters, centred around open spaces (that can be used as play environments). Our workshop participants also recommended designing each unit differently, so as to encourage positive feelings of home and place.

6.2.3. Penetration of noise and smells

Penetration of noise and smells is one of the major areas of concern in higher density living spaces. Unwanted noise and smells from external sources (e.g. traffic, barbecues) or internal sources (e.g. water pipes or neighbours smoking) are often a problem. Many of these problems result from, or are exacerbated by, poor design and construction (e.g. loose door seals, poor sound insulation).

Unwanted noise can greatly impact upon the comfort and liveability of any dwelling. Higher density housing in particular provides the opportunity for unwanted noise from a number of sources (Harman 1983). Unwanted noise can have an external source (such as traffic, which can also affect unit ventilation and air quality) or an internal source (such as neighbours or water pipes), both of which

may be partly preventable through design features such as soundproofing (Engvall 2003: 13; Harman 1983). Unwanted noise can have a number of detrimental health impacts (including exacerbating mental health problems) and can also be a factor influencing social relations in medium and high density developments (Engvall 2003: 13; Sarkissian *et al* 2004: 54-55; Ureta 2007: 106; Williamson 1983). Noise problems have been found to be experienced more acutely in low-income households, especially in social housing (Hughes *et al* 1994: 202-03; Ureta 2007: 107-08).

Noise has also been shown to have adverse health and development effects on children and young people (Evans 2006). It can also increase general stress and discomfort, distraction, sleep disturbance, relational tensions between neighbours, and dissatisfaction with the dwelling (Queensland University of Technology 2010). Indeed, in his study of American Housing Survey data, James (2007b: 477) found that “there was a dramatic reduction in satisfaction” amongst residents who could “hear their neighbours through the walls, floors and ceiling” and that “the impact of noise intrusion was so great as to generally outweigh the positive impact of most other significant design features”.

Many noise problems, which may cause related social issues, have their roots in faulty design. Even relatively minor design defects, such as loose door seals, can have a disproportionate impact on the acoustic performance of high-rise construction (Palmer 2007: 2). There are also a number of other factors that can intervene, including the size and location of a unit, the type and quality of construction materials and the floor coverings and furnishings used. Care in planning, site selection and sound insulation can guard against the impacts of excessive noise (Sarkissian *et al* 2004: 54-55). However, many instances of noise annoyance may not bear much relation to design and construction, but rather to social, demographic, cultural and other factors (Kang 2010: 168-69). For example, some intolerable noises identified by a UK study into resident privacy included loud music at ‘antisocial hours’ and noise from arguments and ‘out of control’ children; sounds that superseded sound insulation (Mulholland Research and Consulting 2003). According to Williamson, the main sources of internal noise intrusion are domestic appliances, music, people – especially children – plumbing noise and impact noise (noise from slamming doors or banging the floor) (Williamson 1983), most of which are lifestyle-related sounds. Regardless of usage patterns and lifestyle choices, plumbing and machine noises can annoy both occupants and their neighbours (Harman 1983).

Acoustic specialist Palmer (2007) observes that in Australia, increasing affluence and the changing profile of higher density living is increasing expectations about acoustic privacy and decreasing tolerance for noise, and therefore there is high demand for design and construction solutions. However, he notes that many high rise buildings reflect less than ideal characteristics regarding their acoustics. For example: they are often built in noisy locations such as industrial areas or major roads in the inner city; they are increasingly part of mixed use developments containing noisy businesses such as nightclubs; cost-cutting decreases space and quality of materials and limits the use special acoustic treatments; and current fashion dictates an aesthetic preference for hard floor surfaces (Palmer 2007).

Noise on hard floor surfaces is one of the most common causes of complaints in Australia, even when this is mitigated against using special soundproofing techniques (Palmer 2007). Our workshop participants cited three reasons that timber flooring may be preferred by residents: health, fashion and cultural considerations. According to our workshop participants, hard floor surfaces is one of many recent trends in unit furnishing that can exacerbate the potential for noise intrusion between units. While older apartments typically had smaller windows and carpets and were furnished with curtains, newer apartments tend to have more glass, polished surfaces and finer window coverings (such as venetian blinds) which are less likely to prevent noise. In light of these changes, our workshop participants suggested that existing acoustic building standards – including glass thickness – may no longer be adequate when combined with these stylistic innovations.

There was a general consensus amongst our workshop participants that even minimum building standards – especially acoustic standards – are not always adhered to by designers and developers. The example was offered of a development in Sydney where the walls do not quite meet the ceilings, leading to voice and smoke intrusion. Even when minimum acoustic standards are met, these minimum standards produce acceptable living conditions only if certain inherent assumptions are accurate, e.g. that all units are carpeted. Indeed, changing fashions as well as new technologies (such as plasma TVs and subwoofers) may mean that minimum acoustic standards are in fact too low.

Problems resulting from floor coverings have also been prolific in recent Sydney media. Jimmy Thomson, who writes a column in the Sydney Morning Herald on issues in high rise living, was so inundated with complaints and comments about flooring-related noise disturbance from high rise residents that he posted an article on the issue on his website (Thomson 2009a) advising on how to address the issue in individual strata developments via by-laws and strata law. He includes links to case studies to show the considerations that have arisen, the strategies that have proven effective and the outcomes of certain noise disputes. He also argues that the acoustic performance of floors designed to the Building Code of Australia minimum are not appropriate for apartment living (this is substantiated by an attached document comparing these with different floor systems, including those rated by the Australian Association of Acoustic Consultants).

Like sounds, smells produced by neighbouring households can intrude on privacy and make people feel out of control of their environment, leading to tension, conflict and general dissatisfaction (James 2007b: 477; Lindsay *et al* 2010: 30; Peper & Spierings 1999: 485). Unwanted smells can originate from traffic and air pollution, from mixed use units within complexes and from waste disposal (Yuen 2005: 11). They can also be generated by cooking within one's own household due to open plan kitchens and/or lack of ventilation, or from someone else's cooking due to the use of the balcony for barbequing, ventilation through doors and windows, or inadequate sealing of walls, floors, doors and ceilings (Engvall 2003; Sarkissian *et al* 2004: 54; Hofer 2008: 100).

Jim Robertson (NSW Fair Trading, workshop discussion) noted that smoke penetration is becoming a more and more frequent and significant complaint registered by Fair Trading. This was linked to a move from residents smoking

indoors to instead smoking on balconies, which directs smoke towards other people's balcony doors (workshop discussion).

Suggestions and solutions

Better manage sound transmission through building standards and building by-laws

Our workshop participants suggested that there should be a review of building standards, and especially acoustic standards in NSW in the light of new design and furnishing trends (timber flooring, larger windows, reduction in soft furnishing).

Workshop participants also suggested that in strata titled properties, by-laws can be created to determine acceptable floor materials, such as enforcing soft floor coverings, or acoustic underlays for hard flooring that have been shown to be effective.

Design suggestions at the construction stage

- Segregate 'noisy' spaces, such as bathrooms and laundries from 'sensitive' or 'habitable' rooms, such as studies and bedrooms, both within and in between individual units (Harman 1983). Locate living areas such as bedrooms and lounges away from common walls, using 'less sound sensitive' spaces such as hallways and kitchens as sound barriers (Mulholland Research and Consulting 2003: 9).
- Though not entirely effective, place high balustrades, hedges and mounds close to dwellings and increased set-backs from the road to decrease external noise intrusion. Bedrooms can also be located as far as possible from major noise producers such as roads to safeguard sleep. Sealed windows are also a possibility, but this compromises ventilation inflow or requires air conditioning (Harman 1983; Kang 2010: 178; Williamson 1983).
- Block out traffic noise on busy roads from bottom floor units by placing thicker glass (10.3-10.5mm, laminated) and two sets of balcony doors to create an air pocket, as well as a ventilation system allowing doors and windows to be shut (workshop discussion).
- Palmer (2007) offers a number of basic design and construction principles to reduce issues of noise intrusion. These include double glazing windows (an expensive option) to prevent external noise intrusion and applying special impact treatments to hard floor surfaces.
- Effectively insulate walls (Mulholland Research and Consulting 2003: 9).
- Building services such as pipes can be specially located and installed with special valves to prevent water hammer (Harman 1983).

CitySounds2

City of Melbourne and RMIT provide an innovative online resource which uses audio software and web design to create a virtual space for designers and developers to replicate the sounds of living in the Melbourne CBD and demonstrate ways to reduce noise transmission.

It also contains detailed fact sheets on designing and modifying urban apartments and reducing sound in higher density. The fact sheets cover strategies and principles toward effective room planning, windows, glazed and standard doors, exterior and interior walls, floors, ceilings building elements, air conditioners and audio equipment.

This resource can be viewed at <http://sound.sial.rmit.edu.au/ADR/index.html>.

Design suggestions post-construction

- Evaluate whether noises are structure-borne or air-borne, using air gaps between panels, increased vibration isolation and soft connecting material such as rubber between building elements to address the former; and high mass, dense, well-sealed materials for the latter (Queensland University of Technology 2010).
- Undertake sufficient maintenance of skirting boards, grouting and door seals as buildings age to prevent sound leaks (Harman 1983; Williamson 1983).

Adapt resident behaviour

- Residents can retrofit their dwelling to manage air-borne noise by hanging tapestries or wall hangings near noise sources, laying carpets and rugs and using curtains, drapes and soft furnishings to absorb noise (Queensland University of Technology 2010).
- Where financially feasible, residents (or landlords) can employ acoustic consultants to assess the property and design proposals and ensure that the finishes to be used will not cause or aggravate noise transmission (Queensland University of Technology 2010).
- Inform owners, builders and residents of the propensity for noise transmission in higher density living and for practical tips at how to avoid and address these issues (workshop discussion; Mulholland Research and Consulting, 2003: 18-19).

6.2.4. Common areas

The previous chapter determined that common areas are important for improving and generating social interaction and a sense of community within a higher density development. In this section, we outline some commonly raised issues surrounding the design of common areas in higher density developments.

Well designed common areas can also have a positive impact on resident interaction within higher density developments and social indicators such as a sense of safety,

sense of belonging and community, participation, friendliness, community spirit, social networks and interaction have been associated with well designed, well laid-out and well maintained common spaces (Raman 2010: 67).

Conversely, insufficient or poorly designed common areas can adversely impact the quality and comfort of higher density living. Poorly designed or maintained common areas and a lack of 'green space' have been found to diminish residential satisfaction (James and Carswell 2008: 7, 12). In their sample of high rise public housing residents in Melbourne, McDonald and Brownlee (1993) found that the most persistent problem identified was common areas (including lifts), and especially the low frequency and responsiveness of maintenance and upkeep of these areas. Cost-cutting has also seen insufficient provision of common property in some areas. In their study of higher density housing in Hong Kong, Chan *et al* (2002: 165-166) found that in some areas high land prices have led developers to limit the number and size of common areas, including lifts and corridors to increase private space and make units more saleable. As Hong Kong's density has increased, wide corridors, open balconies and high ceilings have also decreased (Chan *et al* 2002: 170).

The design and maintenance of common areas has an important influence on both real and perceived safety and security amongst residents in higher density developments. Problems can arise in developments where shared areas like lifts, corridors and stairwells are considered unsafe and prone to criminal activity partly due to a lack of lighting, poor visibility, easy access, or other factors (Hopkins 2007: 173). Conversely, common spaces with recreational objectives such as community gardens in public housing estates have been shown to increase real and perceived safety and security due to the potential for surveillance (Thompson *et al* 2007).

The False Creek North Post-Occupancy Evaluation in Vancouver found that most residents participating in a public forum felt their neighbourhood (external to their buildings) was safe, and many attributed this to greater informal surveillance and supervision due to greater numbers of residents present at any given time in high-density living, both at night and for teenagers and children during the day. As for safety within their buildings, residents' comments reflected the great potential of high density-specific features, such as concierges, cameras and gates, to provide a sense and reality of security (Hofer 2008: 97-98). Even the closeness of higher density living and limited acoustic privacy has been considered an asset with regard to security in the case of a break-in or other emergency (Mulholland Research and Consulting 2003: 16). Similarly, in her Canadian study, Kern (2007: 670) notes that women have been found to prefer living in condominiums on the basis of better personal security due to the security features found in those properties.

The design and layout of common areas will influence the extent to which and by whom they are used (Baum and Palmer 2002). For example, some people may feel uncomfortable using an open pool or barbecue area located in the middle of a development and visible from the many surrounding windows and balconies (Foth & Sanders 2005). Similarly, Raman (2010: 77) found that communal spaces that were not centrally located were likely to discourage social interaction, but if they were so centrally located that they were highly visible might only promote high

levels of movement, and might continue to discourage genuine social activity. Another potential problem with the design and placement of common areas is light and noise pollution into nearby units (Sarkissian *et al* 2004: 43-44). However, other shared open spaces without this degree of public exposure that are used by children may become unsafe due to the lack of communal supervision and surveillance that could otherwise be available (Sarkissian *et al* 2004).

Spaces where spontaneous interactions may occur between residents (such as corridors and entryways) are also important, as well as spaces specifically designed for residents to interact (such as common rooms and shared gardens). Furthermore, the relationship between common space and private space – such as the configuration of units around common space like corridors – can influence perceived crowding or density as well as impacting on sociability (Moch *et al* 1996: 2). Indeed, informal interaction can be hindered as a result of a lack of light, a lack of easy access by foot, or even the size and colour of rooms and spaces appearing uninviting (Foth & Sanders 2005).

External environments are as important as buildings in determining the sense of place felt by housing estate residents according to Beer (2003). Important considerations include safety, aesthetics and image, ‘green space’ and child-friendliness. Layout, design and management may help make residents more comfortable and their lives less stressful, which may contribute to resident satisfaction, reduced social problems and improved social cohesion. Many older buildings may lack the types, and amounts, of external natural spaces deemed appropriate by contemporary observers (Beer 2003).

‘Green space’ (view of and access to the natural environment) has long been established as an important feature of healthy higher density environments, especially to promote social capital, mental health and wellbeing (Baum & Palmer 2002; Beer 2003; Beer *et al* 2003; Newman 1983: 65-66). Vegetation in the shared spaces of higher density apartments has been found to affect how they are perceived in terms of quality, with a lack of trees and shrubs increasing a feeling of crowding (Queensland University of Technology 2010). A significant amount of medical and social science research has established that visual and physical access to greenery, as well as natural light and ventilation, are essential to architecture at a building level if healthy living, both physical and mental, is to be supported (Jackson 2003). For example, Vallance *et al* (2005: 723-24) explain that residents may feel trapped or dislike the setting of their homes when there are not many visible plants. Due to the limitations of private indoor and outdoor space, residents are unlikely to encounter vegetation in their homes if it is not included in common areas (Queensland University of Technology 2010). Unfortunately, the compact city has been linked to a reduction in private open space in and shared ‘green space’ (view of and access to the natural environment), especially for lower income households (Beer *et al* 2003; Burton 2000).

Suggestions and solutions

Design to suit a mix of residents and encourage resident interaction

Like individual units, common areas need to be designed to cater for the different needs and lifestyles of the spectrum of residents, as different residents will desire more or less interaction, and under different circumstances, depending on a number of factors (Foth & Sanders 2005). Designers and developers should ensure that the needs of an intended user demographic (such as retired people or busy professionals) are properly understood (Queensland University of Technology 2010).

Common spaces should be designed to allow for multiple uses. For example, indoor common rooms can include kitchen space and lockable storage. Ideally, indoor rooms should be attached to an outdoor area to allow for overflow of large groups, children to play and people to smoke (workshop discussion).

Other specific design solutions to encourage resident interaction have already been considered in Chapter Five.

Maintenance

Shared spaces should be designed for easy maintenance (Queensland University of Technology 2010).

Maintenance and cleaning of common areas should be frequent. McDonald and Brownlee (1993) found that increasing the number of cleaners and gardeners working in a large higher density development can have a greater impact on resident satisfaction than increasing security guards in Melbourne public high rise.

Design of outdoor common areas

Shared spaces need to be private (within the development), secure and accessible, attractive and comfortable (Queensland University of Technology 2010).

Vegetation should be incorporated into shared space site design (Queensland University of Technology 2010).

Mullholland Research and Consulting (2003) provide some specific examples, such as locating common garden areas or courtyards in front of, and not encroaching on, individual units, distanced from them by a thoroughfare and shielded by vegetation for privacy.

For further and more detailed design ideas, see Cooper-Marcus and Sarkissian (1986).

7. Conclusion

While living in higher density has been the norm in many countries around the world for a long time, this has not been the case in Australia, where the move toward living in greater density has been relatively recent. Both the proportion and number of Australians living in higher density dwellings has increased significantly in the last few decades and will continue to increase rapidly as our state (and more recently, Federal) governments increasingly focus their attention on building up rather than out to accommodate rapidly increasing populations. While people living in higher density dwellings face many of the same day-to-day challenges as people living in lower densities (getting along with neighbours and maintaining their properties), there are two major factors that make living in higher density unique. First, people who live in higher densities live in relatively close physical proximity to one another. Second, people who live in higher density dwellings live in properties where built features and facilities are shared with neighbours.

Many of the issues that arise for people living in higher density are related to these two factors. In this report we have demonstrated that social relations can be both strained and strengthened as a result of living in close proximity with neighbours and that the design and construction of a building can have a significant influence on the nature of these social relations. Indeed, not only is the mix of residents important in influencing social relations in higher density developments, but resident interactions are also strongly influenced by both building design and construction quality.

The implications for residents of living in higher density are profound. Good relations with neighbours and well-designed and constructed buildings have been shown to have positive influences on both the physical and mental health of residents, while poor social relations and poorly designed and constructed buildings can have devastating implications. For example, where social relations are poor, residents can experience isolation, stress, concerns regarding safety (either as a result of concerns about other residents, or due to a lack of passive surveillance), and disruptions to the quiet enjoyment of the homes. Where the design and/or construction quality of the dwelling is poor, residents can experience health problems (e.g. due to unsatisfactory ventilation or insufficient outdoor space), lack of privacy, interrupted sleep (e.g. due to noise), and financial burdens (e.g. as a result of increased electrical costs for heating and/or cooling).

The ability of residents to respond to these concerns differs according to their tenure (owner or tenant), their landlord (public, community or private), their management structure and their income. This report has attempted to focus on issues that are relevant to all (or most) higher density residents and has not delved deeply into these issues, but it is important to acknowledge them briefly here.

While there are constraints placed on owners with regards to the changes they can make in higher density dwellings (e.g. owners cannot make changes to the common property of a strata scheme without consent of the owners corporation), in general property owners are better able to make changes to their living environments than tenants. For example, in privately owned strata schemes in NSW, tenants do not have a right to sit on the owners corporation (the body corporate that makes

decisions regarding the whole scheme) and therefore find it difficult to have an influence on decisions that can affect a whole strata scheme (such as the frequency of repairs and maintenance). Owners also have more security of tenure and longevity of residence, making the development of social networks less challenging. Indeed, some of our workshop participants noted that it would be highly beneficial for social cohesion in strata schemes if tenants could be offered longer residential leases.

Amongst tenants, differences in landlords affect their ability to take control of their social and physical environment. In the private sector, while some landlords receive suggestions from tenants about improvements to the property in good grace, incidences (and stories) of retaliatory evictions and rent increases make such a move difficult for other tenants. The situation is somewhat different in the social housing sector where tenancies are generally more secure. There is also often another level of management between the tenant and the landlord – the property manager or real estate agent – who “can exert a significant amount of influence over tenants’ lives, limiting tenants’ control over their residential environment” (James and Carswell 2008: 7).

The management structure of a higher density development (as determined by its property ownership structure) is also influential. For example, in an apartment block that is entirely owned by one owner and entirely rented out, changes can more easily be made to the building itself and the social mix of residents (for good or for bad). In a company titled building - where all the owners own a share of a company which owns the building, giving them a right to live in, or rent out, a particular apartment – the owners hold a great deal of control over who is able to buy in and rent in the development (interviewing potential residents before accepting them). In a strata titled building – where each apartment is owned by a separate individual and all owners share in the ownership of the common property – when owners cannot come to an agreement, proposed improvements and activities can be stalled for long periods and there is also little control over the residential mix in the building. On the other hand, where strata titled developments work well they provide a model of democratic and co-operative management under which individual owners can own their own property (often at a much lower cost than a detached property in the same area).

Finally, the income and assets of residents also have a major influence on their ability to deal with the issues that can arise when living in higher density housing. Tenants of private landlords, who are on low incomes, who have had highly mobile residential histories and are afraid of retaliatory rent increases, have much less power to address the problems that can arise when living in higher density than wealthy owners of apartments who live in buildings with other wealthy owners with similar desires and aspirations for their building and community.

Given these inequities between higher density residents, it is important that the responsibility for dealing with the issues that can arise in living in higher density is not made solely the responsibility of the resident. While there is much that residents can do to improve their experience of living in higher density, if they can start with a well constructed and well designed property, which is also well managed to encourage positive social relations, then their chances of living well in greater

density are infinitely increased. We hope that this report has gone some way to pointing to some of the major issues that can arise for residents of higher density dwellings, and some suggestions and solutions as to how these problems can be addressed in order to make the most of what living in higher density has to offer.

8. References

- Australian Institute of Health and Welfare (AIHW) (2010) *Community housing 2008-09*. Housing Assistance Data Development Series, Catalogue no. HOU 217. Canberra. Available at: <http://www.aihw.gov.au/publications/hou/217/11419.pdf>. Accessed 28 June 2010.
- Allard, F., Ghiaus, C. and Sczucs, A. (2010). "Natural Ventilation in High-Density Cities", in E. Ng (ed), *Designing High-Density Cities for Social and Environmental Sustainability*. Earthscan, London. Chapter 11.
- Altman, I. (1975). *The environment and social behavior*. Brooks/Cole, Monterey, CA.
- Appold, S. and Yuen, B. (2007). "Families in Flats, Revisited." *Urban Studies*, 44(3), pp.569-589.
- Arthurson, K. (2001). "Achieving Social Justice in Estate Regeneration: The Impact of Physical Construction." *Housing Studies*, 16(6): 807-826.
- Artkins, C. (2007 [cited 2009]) "All in the Mind." *Essential Matters*.
- Australian Bureau of Statistics (ABS) (2006) *Australian Census of Population and Housing*.
- Australian Bureau of Statistics (ABS) (2008). 3222.0 *Population Projections, Australia, 2006 to 2102*. Available at: <http://www.abs.gov.au/ausstats/abs@.nsf/mf/3222.0>. Accessed 18 June, 2010.
- Australian Government (2010). *Nation Building: Economic Stimulus Plan*. Available at: <http://www.economicstimulusplan.gov.au/pages/default.aspx>. Accessed 22 June, 2010.
- Baum, F. and Palmer, C. (2002). "'Opportunity structures': urban landscape, social capital and health promotion in Australia." *Health Promotion International*, 17: 351-361.
- Beer, A. (2003). *The art of making people friendly places*. Online presentation. Available at: <http://www.thesteelvalleyproject.info/green/Places/index.htm>. Last updated 7 March 2007. Accessed 23 March, 2010.
- Beer, A., Delshammar, T. And Schildwacht, P. (2003) "A Changing Understanding of the Role of Greenspace in High-density Housing: A European Perspective", *Built Environment*, 29(2):132-143.
- Beer A and Faulkner D. (2009). *21st Century housing careers and Australia's housing future final report*. Australian Housing and Urban Research Institute (AHURI), Melbourne.
- Bleasdale, M. (2007). *Supporting the housing of people with complex needs*. Australian Housing and Urban Research Institute.
- Bonnefoy, X., Annesi-Maesano, I., Moreno Aznar, L., Braubach, M., Croxford, B., Davidson, M., Ezratty, V., Fredouille, J., Gonzalez-Gross, M., van Kamp, I., Maschke, C., Mesbah, M., Moissonnier, B., Monolbaev, K., Moore, R., Nicol, S., Niemann, H., Nygren, C., Ormandy, D., Röbbel, N. and Rudnai, P. (2004). *Review of evidence on housing and health: Background document*. Fourth Ministerial Conference on Environment and Health. Budapest, Hungary, World Health Organization.

- Bramley, G. and Power, S. (2009) "Urban form and social sustainability: the role of density and housing type", *Environment and Planning B: Planning and Design*, 36:30-48.
- Breheny, M. (1995). "The Compact City and Transport Energy Consumption." *Transactions of the Institute of British Geographers*, 20(1): 81-101.
- Bretherton, J. and Pleace, N. (2008). *Residents' views of new forms of high-density affordable living*. Joseph Rowntree Foundation
- Breyse, P., Farr, N., Galke, W., Lanphear, B., Morley, R. and Bergofsky, L. (2004). "The Relationship between Housing and Health: Children at Risk", *Environmental Health Perspectives*, 112(15): 1583-1588.
- Bryant, I. and McBride, A. (2004). *Pets, Policies and Tenants: Report on Pathway Housing Provider 'Pet Policy' Survey*. Southampton, UK.
- Bunker, R., Gleeson, B., Holloway, D. and Randolph B. (2002). "The Local Impacts of Urban Consolidation in Sydney." *Urban Policy and Research*, 20(2):143-167.
- Bunker, R., Holloway, D. and Randolph, B. (2005a). *Separating Prospects from Propaganda in Urban Consolidation*. Paper presented at SOAC Conference, Griffith University, 30 November – 2 December 2005.
- Bunker, R., Holloway, D. and Randolph, B. (2005b) "The expansion of urban consolidation in Sydney: Social impacts and implications", *Australian Planner*, 42(3):16-25.
- Bunker, R. and Holloway, D. (2007) "How far and in what way is Sydney's new metropolitan strategy likely to be implemented?", *Australian Planner*, 44(1), pp. 26-33
- Burton, E. (2000). "The Compact City: Just or Just Compact? A Preliminary Analysis." *Urban Studies* 37(11): 1969-2001.
- Butler-Bowdon, C. and Pickett, C. (2007). *Homes in the sky: apartment living in Australia*. The Miegunyah Press, Victoria.
- Buys, L., Summerville, J., Kennedy, R. and Bell, L. (2008). "Exploring the social impacts of high-density living in a sub-tropical environment", *Subtropical Cities 2008: From Fault-lines to Sight-lines - Subtropical Urbanism in 20-20*. State Library of Queensland, Brisbane.
- Cardew, R. (1970) *Flats: A Study of Occupants and Locations*. Research Paper No. 4, Ian Buchan Fell Research Project on Housing. University of Sydney, Sydney.
- Cashman, R. (2008) "The Sydney Olympic Park Model: Evolution and realisation", *Connecting Cities: Mega Event Cities*, Sydney: Sydney Olympic Park Authority for Metropolis Congress 2008.
- Chamboredon, J.-C. and Lemaire, M. (1970). "Proximité spatiale et distance sociale. Les grands ensembles et leur peuplement", *Revue française de sociologie*, 11(1):3-33.
- Chan, Y.-K. (1999). "Density, Crowding, and Factors Intervening in their Relationship: Evidence from a Hyper-Dense Metropolis." *Social Indicators Research*, 48: 103-124.
- Chan, E. H. W., Tang, B.-s. and Wong, W.-s. (2002). "Density control and the quality of living space: a case study of a private housing development in Hong Kong." *Habitat International*, 26: 159-175.
- Churchman, A. (1999). "Disentangling the Concept of Density." *Journal of Planning Literature*, 13(4): 389-411.

- Churchman, A. and Ginsberg, Y. (1984). "The Image and Experience of High Rise Housing in Israel." *Journal of Environmental Psychology*, 4: 27-41.
- City Futures Research Centre (2008). *At the grassroots of Urban Consolidation*, ARC Project DP0773388. The demand for Higher density Housing in Sydney and Melbourne Working Paper 1.
- City Futures Research Centre (2009). *The Demand for Higher Density Housing in Sydney and Melbourne*. Available at:
<http://www.fbe.unsw.edu.au/cf/research/cityfuturesprojects/higherdensity>. Accessed 21 June, 2010.
- City Futures Research Centre (2010). *Strata Data: Residential Strata in NSW, A Summary Analysis, Issue 1*. Available at:
http://www.fbe.unsw.edu.au/cf/research/cityfuturesprojects/governingthecompa/ctcity/Strata_Data_Issue%201.pdf. Accessed 21 June, 2010.
- Cooper Marcus, C. and Sarkissian, W. (1986). *Housing As If People Mattered*. Los Angeles, University of California Press.
- Costello, L. (2005). "From Prisons to Penthouses: The Changing Images of High-Rise Living in Melbourne." *Housing Studies*, 20(1): 49-62.
- Council of Australian Governments (COAG) (2010) *Council of Australian Governments Meeting 19-20 April 2010*. Available at:
http://www.coag.gov.au/coag_meeting_outcomes/2010-04-19/docs/communique_20_April_2010.pdf. Accessed 21 June, 2010.
- Danziger, S. and Chaudhury, H. (2009). "Older Adults' Use of Adaptable Design Features in Housing Units: An Exploratory Study." *Journal of Housing for the Elderly*, 23: 134-148.
- Demographia (2010). *6th Annual Demographia International Housing Affordability Survey: 2010 Ratings for Metropolitan Markets*. Available at:
<http://www.fcpp.org/publication.php/3153>. Accessed 18 June, 2010.
- Design for Homes. (2010). *CPD*. Accessible at:
<http://www.designforhomes.org/?act=cpd>. Accessed June 2, 2010.
- Dey, C., Berger, C., Foran, B., Foran, M., Joske, R., Lenzen, M. & Wood, R. (2007). Household Environmental Pressure from Consumption: An Australian environmental atlas. Available at:
<http://www.acfonline.org.au/uploads/res/WaterWindCh9Dey.pdf>. Accessed 29 June, 2010.
- Dixon, J. and Dupuis, A. (2003). "Urban Intensification in Auckland, New Zealand: A Challenge for New Urbanism", *Housing Studies*, 18(3): 353-368.
- Dunn, P. 1990). "The Impact of the Housing Environment upon the Ability of Disabled People to Live Independently", *Disability & Society*, 5(1): 37-52.
- Easthope, H. & Randolph, B. (2009) "Governing the Compact City: The challenges of apartment living in Sydney, Australia", *Housing Studies*, 24(2), pp. 243-259
- Easthope, H. (2004). "A Place Called Home", *Housing, Theory and Society*, 21(3), pp. 128-138.
- Easthope, H., Randolph, B. and Judd, S. (2009). *Managing Major Repairs in Residential Strata Developments in New South Wales*. City Futures Research Centre, University of New South Wales, Sydney.
- Easthope, H., Tice, A. and Randolph, B. (2010). "The Desirable Apartment Life?" in B. Randolph, T. Burke, K. Hulse and V. Milligan (eds) (2010) *Refereed papers presented at the 4th Australasian Housing Researchers Conference*,

- Sydney, 5th - 7th August 2009. City Futures Research Centre, University of New South Wales, Sydney.
- Engvall, K. (2003). *A Sociological Approach to Indoor Environment in Dwellings: Risk factors for Sick Building Syndrome (SBS) and Discomfort*. Comprehensive Summaries of Uppsala Dissertations from the Faculty of Medicine, ACTA Universitatis Upsaliensis, Uppsala. 1276.
- EPA Victoria (2008a). *Annoyed by noise?* EPA Publication 406.3. EPA Victoria. Available at:
[http://epanote2.epa.vic.gov.au/EPA/publications.nsf/2f1c2625731746aa4a256ce90001cbb5/1964185e542e643eca2574d700017a5d/\\$FILE/406.3.pdf](http://epanote2.epa.vic.gov.au/EPA/publications.nsf/2f1c2625731746aa4a256ce90001cbb5/1964185e542e643eca2574d700017a5d/$FILE/406.3.pdf). Accessed 22 June, 2010.
- EPA Victoria (2008b). *Residential Noise: Residents' Noise Stories*. Publication 1235. EPA Victoria. Available at:
[http://epanote2.epa.vic.gov.au/EPA/Publications.nsf/2f1c2625731746aa4a256ce90001cbb5/e5cb2b7ce8dcd578ca2573e900059c0b/\\$FILE/1235.pdf](http://epanote2.epa.vic.gov.au/EPA/Publications.nsf/2f1c2625731746aa4a256ce90001cbb5/e5cb2b7ce8dcd578ca2573e900059c0b/$FILE/1235.pdf). Accessed 22 June, 2010.
- Evans, G., Lepore, S. and Schroeder, A. (1996). "The Role of Interior Design Elements in Human Responses to Crowding." *Journal of Personality and Social Psychology*, 70(1): 41-46.
- Evans, G. (2006). "Child Development and the Physical Environment." *Annual Review of Psychology*, 57: 423-451.
- Fair Trading NSW (2009). *Strata Schemes Management Act 1996: Review of model by-law hanging of washing*. Report to the Minister for Fair Trading. Available at:
http://www.fairtrading.nsw.gov.au/pdfs/About_us/Strata_schemes_report_on_review_of_hanging_washing_bylaw.pdf. Accessed 29 June, 2010.
- Fincher, R. (2004) "Gender and Life Course in the Narratives of Melbourne's High-rise Housing Developers", *Australian Geographical Studies*, 42(3), pp. 325-338.
- Fincher, R. (2007). "Is High-rise Housing Innovative? Developers' Contradictory Narratives of High-rise Housing in Melbourne", *Urban Studies*, 44(3): 631-649.
- Forrest, R. and Kearns, A. (2001). "Social Cohesion, Social Capital and the Neighbourhood." *Urban Studies*, 38(12): 2125-2143.
- Forrest, R., Grange, A. and Yip, N.-M. (2002). "Neighbourhood in a high rise, high density city: some observations on contemporary Hong Kong", *The Sociological Review*, 50(2): 215-240.
- Forster, C. (2006) "The Challenge of Change: Australian cities and urban planning in the new millennium", *Geographical Research*, 44(2):173-182.
- Forster, C. (2004) *Australian Cities: Continuity and Change, Melbourne*: Oxford University Press
- Foth, M. and Sanders, P. (2005). *Social Networks in Inner-City Apartment Complexes and the Implications for the Residential Architecture of Public Space*. 2nd International Conference on Communities and Technologies. Milan, Italy.
- Fuerst, J. and Petty, R. (1991). "High-rise housing for low-income families." *Public Interest*, (103): 118-130.
- Gentoo Group. (2006) *Swing a Cat*. Website produced by Design for Homes, UK. Available at: <http://www.swingacat.info>. Accessed 29 June, 2010.

- Gifford, R. (2007). "The Consequences of Living in High-Rise Buildings." *Architectural Science Review*, 50(1): 1-16.
- Gillis, A. (1983) "Strangers Next Door: An Analysis of Density, Diversity, and Scale in Public Housing Projects", *The Canadian Journal of Sociology / Cahiers canadiens de sociologie*, 8(1): 1-20.
- Ginsberg, Y. and Churchman, A. (1985). "The Pattern and Meaning of Neighbourhood Relations in High-Rise Housing in Israel", *Human Ecology*, 13(4): 467-84.
- Gleeson, B. (2007) "Child-friendly Cities" in R. Atkinson, T. Dalton, B. Norman and G. Wood (eds) *Urban 45: New ideas for Australia's cities*, RMIT, Melbourne and University of Tasmania, Hobart.
- Gleeson, B. and Sipe, N. (2006) *Creating Child Friendly Cities: Reinstating kids in the city*. Routledge, New York.
- Halpern, D. (1995). *Mental health and the built environment: more than bricks and mortar?* Taylor & Francis, London.
- Harman, D. (1983). "Noise Problems in Medium Density Housing", in B. Judd and J. Dean (eds), *Medium Density Housing in Australia*. RAI Education Division, Canberra: 84-87.
- Healy, E. and Birrell, B. (2004) *Housing and Community in the Compact City*. Australian Housing Research Institute, Melbourne.
- Henderson-Wilson, C. (2008). *Inner city high-rise living: a catalyst for social exclusion and social connectedness?* Australian Housing Researchers' Conference. RMIT University, Melbourne: 1-13.
- Hofer, N. (2008). *Compilation Report of the Process, Findings and Recommendations from the False Creek North Post-Occupancy Evaluation*. School of Community and Regional Planning, University of British Columbia.
- Hopkins, L. and Thomas, J. (2002). *e-social capital: Building community through electronic networks*. Melbourne, Swinburne Institute for Social Research.
- Hopkins, L. (2007). "Social capital, health and electronic community in public high-rise estates: An Australian case-study", *Health Sociology Review*, 16: 169-178.
- Hughes, D., Karn V. and Lickiss, R. (1994). "Neighbour Disputes, Social Landlords and the Law", *Journal of Social Welfare and Family Law*, 16(2): 201-228.
- Hunter, C., Nixon, J. and Slatter, M. (2005). "Neighbours Behaving Badly: Anti-social Behaviour, Property Rights and Exclusion in England and Australia", *Macquarie Law Journal*, 5: 149-176.
- Huss, R. (2005). "No Pets Allowed: Housing Issues and Companion Animals." *Animal Law*, 11: 69-130.
- Jackson, V. (1998). *Making room for pets in high and medium density housing - the role of urban planning*. Urban Animal Management Conference Proceedings, 1998.
- Jackson, L. (2003). "The relationship of urban design to human health and condition", *Landscape and Urban Planning*, 64: 191-200.
- James, R. and Carswell A. (2008). "Home sweet apartment: A text analysis of satisfaction and dissatisfaction with apartment homes", *Housing and Society*, 35(1): 91-111.
- James, B. (2007a). *Children's and Young People's Housing Experiences: Issues and Scoping Paper*. Prepared for the Centre for Housing Research. Public Policy & Research, Wellington, New Zealand.

- James, R. (2007b). "Multifamily Housing Characteristics and Tenant Satisfaction", *Journal of Performance of Constructed Facilities*, 21(6):472-490.
- Jenks, M., Burton E. and Williams, K. (eds) (1996). *The Compact City: A Sustainable Urban Form*. E & FN Spon, London.
- Jephcott, P. and Robinson, H. (1971). *Homes in High Flats: Some of the human problems involved in multi-storey housing*. Oliver & Boyd, Edinburgh.
- Judd, B. and Dean, J. (eds) (1983). *Medium Density Housing in Australia*. Canberra, RAIA Education Division.
- Judd, B. Olsberg, D., Quinn, J., Groenhart, L. & Demirbilek, O. (2010) *Dwelling, land and neighbourhood use by older home owners*, AHURI Final Report. Australian Housing and Urban Research Institute, Melbourne.
- Jung, Y.-M. and Bridge, C. (2009). *Stairs: A Summary Bulletin*. For the Home Modification Information Clearinghouse.
- Kang, J. (2010). "Sound Environment: High- versus Low-Density Cities", in E. Ng, *Designing High-Density Cities for Social and Environmental Sustainability*. Earthscan, London, pp. 163-180.
- Kearney, A. (2006) "Residential Development Patterns and Neighborhood Satisfaction: Impacts of Density and Nearby Nature", *Environment and Behavior*, 38:112-139.
- Kendig, H. (1984). "Housing Careers, Life Cycle and Residential Mobility: Implications for the Housing Market". *Urban Studies*, 21:271-283.
- Kern, L. (2007). "Reshaping the Boundaries of Public and Private Life: Gender, Condominium Development, and the Neoliberalization of Urban Living." *Urban Geography*, 28(7): 657-681.
- Kübler, D. and Randolph, B. (2008) "Metropolitan Governance in Australia – the Sydney Experience", in R. Hambleton (ed) *Governing Cities in a Global Era*. Palgrave, NSW.
- Lam, L. (2010). "A new, quieter future", *Inner West Courier*, 20 April, 2010. Inner City Edition, Sydney.
- Lang, R. and Hornburg, S. (1998). "What Is Social Capital and Why Is It Important to Public Policy?" *Housing Policy Debate*, 9(1): 1-16.
- Leccese, M. and McCormick, K. (eds) (2000). *Charter of the New Urbanism*. McGraw-Hill, New York.
- Lee, S.-H. (2005). *Spatial Order and Sense of Community in High-Rise Apartment Developments in Bundang, the Metropolitan Area of Seoul, Korea*. Faculty of the Built Environment, University of New South Wales. Master of Architecture: 144.
- Leishman, C., Aspinall, P., Munro, M. and Warren, F. (2004). *Preferences, quality and choice in new-build housing*. Joseph Rowntree Foundation, York, UK.
- Lilley, S. (2006). *Digging the Dirt on Density: A Study of Medium Density Housing in Christchurch's Living Three Zone*. University of Canterbury. Master of Arts in Geography. Christchurch, New Zealand.
- Lindsay, M., Williams, K. and Dair, C. (2010). "Is There Room for Privacy in the Compact City?" *Built Environment*, 36(1): 28-46.
- Lister, D. (2006). "Unlawful or just awful? Young people's experiences of living in the private rented sector in England." *Young: Nordic Journal of Youth Research*, 14(2): 141-155.

- Major Cities Unit, Infrastructure Australia, Australian Government (2010) *State of Australian Cities*. Available at: <http://www.apo.org.au/research/state-australian-cities-2010>. Accessed 21 June, 2010.
- McDonald, P. and Brownlee, H. (1993). "High-Rise Parenting: Raising Children in Melbourne's High-Rise Estates", *Family Matters*, 36:4-15. Australian Institute of Family Studies.
- McKenzie, S. (2004). *Social Sustainability: Towards some definitions*. Hawke Research Institute Working Paper Series. Magill, South Australia, Hawke Research Institute, University of South Australia. No. 27.
- Meredyith, D., Hopkins, L., Ewing, S. and Thomas, J. (2002). "Measuring Social Capital in a Networked Housing Estate." *First Monday*, 7(10).
- Metropolis Research (2005). *Inner City Apartment Residents' Survey*. Melbourne City Council, Melbourne.
- Mitchell, R. (1971). "Some Social Implications of High Density Housing." *American Sociological Review*, 36(1): 18-29.
- Moch, A., Bordas, F. and Hermand, D. (1996). "Perceived density: how apartment dwellers view their surroundings." *Le courrier du Centre National de la Recherche Scientifique*, 82: 131-132.
- Moore, C. (2009) *Discussion Paper: Proposals for strata legislation reform*. Available at: http://www.bright-duggan.com.au/docs/cmoore_doc1.pdf. Accessed 21 June, 2010.
- MORI Social Research Institute (2003). *Neighbour Noise: Public Opinion Research to Assess its Nature, Extent and Significance*. Department for Environment, Food and Rural Affairs (DEFRA). UK.
- Mulholland Research & Consulting (2003). *Perceptions of Privacy and Density in Housing: Report on Research Findings prepared for the Popular Housing Group*. London.
- Neuman, M. (2005). "The Compact City Fallacy." *Journal of Planning Education and Research*, 25: 11-25.
- New South Wales (NSW) Department of Planning (2005) *City of Cities: A Plan for Sydney's Future*. Available at: <http://www.metrostrategy.nsw.gov.au>. Accessed 28 June, 2010.
- New South Wales (NSW) Department of Planning (2010) Metropolitan Strategy Review: Sydney Towards 2036. Available at: <http://www.metrostrategy.nsw.gov.au/Resources/SydneyTowards2036/tabid/286/language/en-AU/Default.aspx>. Accessed 28 June, 2010.
- New South Wales (NSW) Government (2003). *Living in strata developments in 2003*, NSW Office of Fair Trading, Sydney. Available at: http://www.fairtrading.nsw.gov.au/pdfs/About_us/Strataip03.pdf. Accessed 3 March, 2010.
- New South Wales (NSW) Government (2010). *Metropolitan Transport Plan: Connecting the City of Cities*. Available at: <http://www.nsw.gov.au/metropolitantransportplan>. Accessed 28 June, 2010.
- Newman, P. (1983). "Urban Density and Human Well Being: Myths and Reality", in B. Judd and J. Dean (eds), *Medium Density Housing in Australia*. RAI Education Division, Canberra, pp. 62-71.
- Newman, P. (2005). "Pipe Dreams and Ideologues: Values and Planning." *People and Place*, 13(3): 41-53.

- Newman, P. and Kenworthy, J. (1998). *Sustainability and Cities: Overcoming automobile dependence*. Island Press Books, Washington.
- Newman, P. and Kenworthy, J. (2006). "Urban Design to Reduce Automobile Dependence", *Opolis*, 2(1):35-52.
- Ng, E. (ed) (2010). *Designing High-Density Cities For Social & Environmental Sustainability*. Earthscan, London.
- Ohlin, J. (2003). *A Suburb too Far? Urban consolidation in Sydney*. NSW Parliamentary Library Research Service Briefing paper no. 04/03. Parliament of New South Wales. Available at:
[http://www.parliament.nsw.gov.au/prod/parlament/publications.nsf/0/1E5388BA6E5047FDCA256ECF00075066/\\$File/04-03.pdf](http://www.parliament.nsw.gov.au/prod/parlament/publications.nsf/0/1E5388BA6E5047FDCA256ECF00075066/$File/04-03.pdf). Accessed 29 June, 2010.
- Palmer, R. (2007). "Noise In High Rise Buildings". *Tall and Green: Typology for a Sustainable Urban Future*. Congress of the Council on Tall Buildings and Urban Habitat. Grand Hyatt, Dubai.
- Parkes, A., Kearns, A. and Atkinson, R. (2002). "What Makes People Dissatisfied with their Neighbourhoods?" *Urban Studies*, 39(13): 2413-2438.
- Parliament of Australia (1992). *Patterns of Urban Settlement: Consolidating the Future?* Report of the House of Representatives Standing Committee for Long-Term Strategies. Australian Government Publishing Service, Canberra.
- Peper, B. and Spierings, F. (1999). "Settling Disputes Between Neighbours in the Lifeworld: An Evaluation of Experiments with Community Mediation in the Netherlands", *European Journal on Criminal Policy and Research*, 7:483-507.
- Perkins, A., Hamnett, S., Pullen, S., Zito, R. & Trebilcock, D. (2009). "Transport, housing and urban form: The life cycle of energy consumption and emissions of city centre apartments compared with suburban dwellings", *Urban Policy and Research*, 27(4): 377-396.
- Pinçon, M. (1981). "Habitat et modes de vie: La cohabitation des groupes sociaux dans un ensemble H.L.M." *Revue française de sociologie*, 22(4): 423-427.
- Planning SA (2010). *The Plan for Greater Adelaide*. Available at:
<http://www.dplg.sa.gov.au/plan4adelaide/html/plan.cfm>. Accessed 29 June, 2010.
- Property Council of Australia (2003). *Renewing our strata titled city: a discussion paper on reforming Strata Title law*. Property Council of Australia, Sydney.
- Property Council of Australia (2010). *Strata Title Renewal*. Property Council of Australia, Sydney.
- Queensland Government (2009). *South East Queensland Regional Plan 2009-2031*. Available at: <http://www.dip.qld.gov.au/seqregionalplan>. Accessed 29 June, 2010.
- Queensland University of Technology (2010). *High-Density Liveability Guide*. Northshore Development Group. Available at:
<http://www.highdensityliveability.org.au>. Accessed 1 June, 2010.
- Quinn, J., Judd, B., Olsberg, D. and Demirbilek, O. (2009). *Dwelling, land and neighbourhood use by older Home Owners*. AHURI Positioning Paper No. 111. Australian Housing and Urban Research Institute, Sydney.
- Raman, S. (2010). "Designing a Liveable Compact City: Physical Forms of City and Social Life in Urban Neighbourhoods." *Built Environment* 36(1): 63-80.

- Randolph, B. and Holloway, D. (2005). *A Social Profile of Households in Higher Density Housing in Fairfield*. City Futures Research Centre, Faculty of the Built Environment, University of New South Wales.
- Randolph, B. (2006). "Delivering the Compact City in Australia: Current Trends and Future Implications", *Urban Policy and Research*, 24(4):473-490.
- Recsei, T. (2005) "Pipe Dreams: The shortcomings of ideologically based planning", *People and Place*, 13(2): 68-8.
- Sarkissian, W. and Kerr, A. (2003). *High-Density Dwelling Design for Children*. Mirvac Fini: Burswood lakes. Sarkissian Associates Planners, West End, QLD.
- Sarkissian, W. and Stenberg, B. (2003a). *Accessibility for People with a Disability in Residential Open Space*. Mirvac Fini: Burswood Lakes. Sarkissian Associates Planners, West End, QLD.
- Sarkissian, W. and Stenberg, B. (2003b). *Housing Design for Diverse Cultures*. Mirvac Fini: Burswood Lakes, Working Paper 14. Sarkissian Associates Planners, West End, QLD.
- Sarkissian, W., Shore, Y. and La Rocca, S. (2003a). *Guidelines for Children in the Outdoor Residential Environment*. Mirvac Fini: Burswood Lakes. Sarkissian Associates Planners, West End, QLD.
- Sarkissian, W., Stenberg, B., Cross, A., Forsyth, A., Murray, J., Sivaciyan, S., Stewart, K. and Dodd, T. (2003b). *High-Density Dwelling Design for Older People*. Mirvac Fini: Burswood Lakes. Sarkissian Associates Planners, West End, QLD.
- Sarkissian, W., Stenberg, B. and Walton, S. (2003c) *Working from Home: Literature review and planning and design guidelines*. Mirvac Fini: Burswood Lakes. Sarkissian Associates Planners, West End, QLD.
- Sarkissian, W., Walton, S., Kerr, H., Hazebroek, A., Ludher, E., Shore, Y., Hazebroek, J. and Humphreys, C. (2004). *Social Issues and Trends Associated with Medium- to High- Density Urban Living*. Final report for the Land Management Corporation. Sarkissian Associates Planners, West End, QLD.
- Searle, G. (2004). "The Limits to Urban Consolidation." *Australian Planner*, 41(1): 42-48.
- Searle, G. (2007) *Sydney's Urban Consolidation Experience: Power, politics and community*. Urban Research Program Research Paper 12, Griffith University, Brisbane.
- Séguin, A.-M. (1997). "La cohabitation interethnique en HLM: vie quotidienne en enjeux territoriaux." *Cahiers de géographie du Québec*, 41(114): 393-404.
- Shelter England (2005) *Full house? How overcrowded housing affects families*. Available at: http://england.shelter.org.uk/professional_resources/policy_library/policy_library_folder/?a=39532. Accessed 21 June, 2010
- Shelter England (2010) *Supporting Families and Children*. Available at: http://england.shelter.org.uk/housing_issues/Creating_better_neighbourhoods/supporting_families_and_children. Accessed 21 June, 2010.
- Sherry, C. (2006). "Termination of strata schemes in New South Wales – proposals for reform", *Australian Property Law Journal*, 13, pp. 227-239.
- Sherry, C. (2008). "The legal fundamentals of high rise buildings and master planned estates: Ownership, governance and living in multi-owned housing with a case study on children's play." *Australian Property Law Journal*, 16: 1-23.

- Singapore Housing & Development Board (2010). *Heartland Beat*. Available at: <http://www.hdb.gov.sg/fi10/fi10333p.nsf/w/CNOverview?OpenDocument>. Accessed 22 June 2010.
- Singapore Ministry of National Development (2009). *Report by the Workgroup on Promotion of Better Social Behaviour in HDB Estates*. Available at: [http://www.hdb.gov.sg/fi10/fi10297p.nsf/ImageView/REPORT/\\$file/Report+on+Promotion+of+Better+Social+Behaviour.pdf](http://www.hdb.gov.sg/fi10/fi10297p.nsf/ImageView/REPORT/$file/Report+on+Promotion+of+Better+Social+Behaviour.pdf). Accessed 22 June 2010.
- Sivam, A. and Karuppanan, S. (2009). *Density and Sustainable Residential Development*. European Network for Housing Research Conference. Prague, Czech Republic.
- Spearitt, P. (1978). *Sydney Since the Twenties*. Hale and Ironmonger, Sydney.
- Spearitt, P. (2000). *Sydney's Century: A History*. University of New South Wales Press, Sydney.
- Steidl, R. (1981). "User Effort Related to Apartment Design." *Family and Consumer Sciences Research Journal*, 9(4): 297-309.
- Stone, D. (2007). "You Take My Space, I Take Your Air: An Empirical Study of Disabled Parking and Motor Vehicle Laws for Persons with Disabilities." *Ohio Northern University Law Review*, 33: 665-713.
- Syme, C., McGregor, V. and Mead, D. (2005). *Social Implications of Housing Intensification in the Auckland Region: Analysis and Review of Media Reports, Surveys and Literature*. Auckland Sustainable Cities Program. Available at: <http://www.sustainableauckland.govt.nz/download/socialimplications.pdf>. Accessed 29 June, 2010.
- Talen, E. (2008). *Design for Diversity: Exploring Socially Mixed Neighbourhoods*. Architectural Press, London.
- Thompson, S., Corkery, L. and Judd, B. (2007). *The Role of Community Gardens in Sustaining Healthy Communities*. State of Australian Cities (SOAC) National Conference, Adelaide.
- Thomson, J. (2007). "Residents losing their say about managing", *The Sydney Morning Herald*, 26 February, 2007. Available at: <http://www.smh.com.au/news/national/residents-losing-their-say-aboutmanaging/2007/02/25/1172338469678.html>. Accessed 26 February, 2007.
- Thomson, J. (2009a) "Timber Floors – Facts and Frictions", *Flat Chat*. Available at: http://www.flat-chat.com.au/?page_id=749. Accessed 23 June, 2010.
- Thomson, J. (2009b). "Water on the brain", *The Sydney Morning Herald*, 13 June, 2009. Available at: <http://www.smh.com.au/news/domain/news/water-on-the-brain/2009/06/12/1244664840358.html>. Accessed 23 June, 2010.
- Thomson, J. (2009c). "Beware the tap dance", *The Sydney Morning Herald*, 16 November, 2009. Available at: <http://www.smh.com.au/news/domain/australian-capital-territory/beware-the-tap-dance/2009/11/16/1258219784809.html>. Accessed 23 June, 2010.
- Thomson, J. (2010a). "The kids are not all right", *The Sydney Morning Herald*, 6 April, 2010. Available at: <http://www.smh.com.au/news/domain/australian-capital-territory/the-kids-are-not-all-right/2010/04/06/1270374188693.html>. Accessed 23 June, 2010.
- Thomson, J. (2010b). "Pets, kids, noisy neighbours", *The Sydney Morning Herald*, 22 May, 2010. Available at: <http://news.domain.com.au/domain/real-estate->

- news/pets-kids-noisy-neighbours-20100521-w152.html. Accessed 23 June, 2010.
- Thorne, R. (1983). "Environment/Behaviour Research and Medium Density Housing", in B. Judd and J. Dean (eds), *Medium Density Housing in Australia*. RAI Education Division, Canberra, pp. 72-75.
- Troy, P. (1996). "Urban Consolidation and the Family", in M. Jenks, E. Burton and K. Williams (eds), *The Compact City: A Sustainable Urban Form?* E & FN Spon, Oxford, UK, pp. 155-165.
- Trubka, R., Newman, P. & Bilsborough, D. (2009). *Assessing the costs of alternative development paths in Australian cities*. Curtin University Sustainability Policy Institute. Available at: http://sustainability.curtin.edu.au/local/docs/Curtin_Sustainability_Paper_0209.pdf. Accessed 10 May, 2009.
- Turkington, R., van Kempen, R. And Wassenberg, F. (eds) (2004). "High-rise housing in Europe: Current trends and future prospects", *Housing and Urban Policy Studies*, Vol. 28. DUP Science, MG Delft, the Netherlands.
- Ureta, S. (2007). "Noise and the Battles for Space: Mediated Noise and Everyday Life in a Social Housing Estate in Santiago, Chile", *Journal of Urban Technology*, 14(3): 103-130.
- Vallance, S., Perkins, H. and Moore, K. (2005). "The results of making a city more compact: neighbours' interpretation of urban infill", *Environment and Planning B: Planning and Design*, 32: 715-733.
- Victorian Department of Sustainability and Environment (2006). *Melbourne 2030: Planning for Sustainable Growth*. Available at: <http://www.dse.vic.gov.au/melbourne2030online>. Accessed 29 June 2010.
- Vulker, J. (1986). *Housing in Australia*. Jacaranda Press, Milton.
- Western Australian Planning Commission (2004). *Network City: community planning strategy for Perth and Peel*. Available at: <http://www.planning.wa.gov.au/Plans+and+policies/Publications/273.aspx>. Accessed 29 June 2010.
- Whitzman, C. and Mizrahi, D. (2009). *Vertical Living Kids: Creating supportive high rise environments for children in Melbourne, Australia*. Victorian Health Promotion Foundation, Melbourne.
- Williamson, R. (1983). "Planning for Noise Control & Privacy", in B. Judd and J. Dean (eds), *Medium Density Housing in Australia*, RAI Education Division, Canberra, pp. 88-91.
- Wulff, M., Healy, E. and Reynolds, M. (2004). "Why don't small households live in small dwellings?", *People and Place*, 12(1): 56-71.
- Yates, J. (2001). "The Rhetoric and Reality of Housing Choice: The role of urban consolidation", *Urban Policy and Research*, 19(4): 491-527.
- Yates, R. (1995). *Child Friendly Housing: A Guide for Housing Professionals*. Society for Children and Youth of British Columbia, Vancouver.
- Yuen, B. (2005). "Romancing the high-rise in Singapore", *Cities* 22(1): 3-13.
- Yuen, B., Yeh, A., Appold, S., Earl, G., Ting, J. and Kurnianingrum Kwee, L. (2006). "High-rise Living in Singapore Public Housing", *Urban Studies*, 43: 583-600.

Endnotes

¹ That is, multiple buildings occupying a common site with shared facilities. Hereafter referred to as a 'development'.

² Owner-occupation and investor-owned lots were calculated by comparing the address of a lot with the registered address of its owner. When the two addresses match, a lot is noted as owner-occupied; if the two addresses do not match, the lot is noted as investor-owned. As such, these figures should be considered an estimate only. The data presented pertains to residential strata schemes. To capture all strata properties used for the purpose of residence, residential schemes and lots reported in this newsletter include the four zoning categories of A (Residential), C (City of Sydney County Centre), D (10(a) sustainable mixed use development) and M (Mixed use). Commercial schemes are not included. Some non-residential lots may be included in the presented figures, for example where they form part of a mixed-use development.

³ This included all those people living in flats, units and apartments but excluded the Census category of villas, row or terrace houses, town-houses and semi-detached dwellings. The extracted data included residents (whether owner occupiers or renters), but excluded all those in forms of social renting.

⁴ For more detail, see: <http://www.fbe.unsw.edu.au/cf/research/cityfuturesprojects/governingthecomcompactcity/>.