*CITY**FUTURE**s

The social outcomes of urban consolidation in Sydney

Ray Bunker, Darren Holloway and Bill Randolph

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1. INTRODUCTION

During the so-called 'long boom' years following the Second World War, the development of Australian cities took place through extensive and headlong suburbanisation, almost entirely in the form of a separate house on its own block of land.   The reasons for this are most cogently argued by Hugh Stretton in his influential *Ideas for Australian Cities* (1970), basically in terms of satisfying human needs and aspirations of the time.   The metropolitan plan which most exemplified this suburbanisation process was the Sydney Region Outline Plan of the same year which essentially sought to combine Sydney's emergence as a world city with a pleasant living environment for its residents (State Planning Authority 1968).

New policy demands: saving state expenditure on infrastructure, and demand for residential land

During the late 1970s and 1980s, the state began to withdraw from many of the public services traditionally provided by it through privatisation and out-sourcing (Gleeson & Low, 2000).   The development of low-density suburbia and the so-called 'quarter-acre block' was criticised as wasteful in terms of infrastructure provision and land demand.   At the same time, population loss in the inner suburbs led to the apparent appearance of spare capacity in social facilities, most dramatically through a fall in school enrolments, and in underground infrastructure.   The state government began to increase densities in greenfields development, and encourage population increases in inner and middle suburbs by zoning substantial areas for medium- and high-density housing.

New policy demands: saving energy and limiting car use and travel

Influential research and publications in the 1980s and 1990s such as that of Newman and Kenworthy (1989, 1992) argued there was a causal correlation between car use and urban density: the higher the density the less the use of the car.   On this basis it was claimed that by encouraging people to live in areas with good public transport access such as around railway stations and along bus routes would diminish car use and save fuel and energy.   This idea of accessibility to public transport now dominates zoning and development policies both in initial development for higher densities in outer suburbs, and redevelopment in inner and middle suburbs.

New policy demands: increasing housing choice

Urban consolidation has also been promoted on the grounds of widening housing choice.   Suburban growth such as that shaped by the Sydney Region Outline Plan was dominated by separate houses, designed and marketed mainly for family households with children.   Most of them were being purchased, or to a lesser extent owned outright by their residents.   It was argued that providing more attached housing in the form of villas, townhouses, flats, units, and apartments would provide many more options in terms of housing choice.   This would be particularly so if these were much more widely distributed throughout the metropolitan area than had previously been the case.

It was further argued that such attached dwellings were much more likely to be available for rental than separate houses. This would be convenient for the more varied, mobile and footloose types of households which were becoming more common with the social and cultural changes beginning in the 1970s.   It should be noted however, that later research has indicated other reasons for the increasing use of rental housing (Yates, 2002).

There were also important demographic trends, such as the ageing of the population which helped to increase the importance of single or dual-person households. An interesting account of the trade-offs between location, dwelling type and kind of tenure was carried out by Yates in 2001, and is discussed below.

New policy demands: a comment

The first two general reasons for the adoption of urban consolidation policies in the last two decades (infrastructure costs and transport use) have been extensively researched and discussed in the literature. It has been shown that these particular reasons for the adoption of urban consolidation policies are somewhat problematical in their logic and assumed outcome (Troy 1996, Searle 2003). It is therefore all the more surprising that so little research has been carried out on the third key policy driver, namely how far housing needs are met in the various forms of medium- and high-density dwellings which are being built and which now outnumber separate houses in terms of new housing construction in Sydney.

Urban consolidation policies

Urban consolidation policies are now a principal instrument in the planning and development of Sydney. The NSW State Government has defined urban consolidation as:

> "increasing the density of dwellings or population, or both. It does not refer to one single policy, but rather a number of related land use measures and housing initiatives that can increase residential densities." (NSW Department of Environment and Planning 1984:1).

In practice, urban consolidation has taken two main forms (NSW Department of Planning 1995, NSW Department of Urban Affairs and Planning 1998). The first encourages higher density development of new greenfields development on the urban fringe, and the second involves 'densification' including 'spot densification' of existing urban space through redevelopment of brownfields and infill sites for residential use at medium to high densities.

The objective of this research report is to examine what kinds of people are living in the different dwelling types constituting medium- and high-density housing, to define and describe the housing sub-markets that exist in attached housing, and to outline the further research needed. It is divided into four sections. It starts by reviewing recent research concerning the effect of urban consolidation on the housing choices of those living in Sydney. The second part examines the characteristics of the dwelling stock in Sydney and how these have changed over the period 1991-2001. The third section analyses data from the 1991 and 2001 Censuses of Population and Housing in Sydney to identify the characteristics of people living in the different types of dwelling

making up medium- and high-density residential development in Sydney. The fourth part uses factor analysis to define and locate housing sub-markets in attached dwellings. There is a companion Issues Paper (Bunker, Holloway & Randolph, 2005a) which examines policy provisions regarding attached dwellings contained in the emerging metropolitan strategy for Sydney, and comments on their implications in terms of housing provision and social impacts.

The large suite of Tables which holds the basic data is at the back of this Paper in Appendix 1, except for those explaining the factor analysis. The text distils and draws on this data and Figures accompany the text to illustrate particularly important features of the analysis.

2. PREVIOUS RESEARCH ON THE EFFECT OF URBAN CONSOLIDATION ON THE RESIDENTIAL POPULATION

Gooding (1990) carried out the first research of this kind when he looked at the characteristics of the population of census collectors' districts in which substantial medium-density building had taken place. This was done to establish the subsequent need for the planning and provision of human services due to changing and emerging concentrations of people as a result of urban consolidation.

In 1998 a detailed analysis of the demand for dwellings considered to represent urban consolidation was carried out by the Planning Research Centre for a group of developers and financiers. The study used Census data to analyse population characteristics and movements for the period 1991-1996 and compared these with changes to the dwelling stock. This was done for 12 groups of councils which were then consolidated into Inner, Middle and Outer Rings of Sydney. The conclusions are important. For the Inner ring it was concluded that in terms of future demand:

> *"It appears multi unit housing demand is being driven by the growth of higher income, professional lone person households, predominantly renting. There is no evidence of a significant change in housing preferences on the part of particular household types or any significant demand from empty nesters…..It is difficult to see where any growth in owner occupiers is going to come from." (Planning Research Centre 1998, Vol.1:2).*

For the Middle Ring the judgement was:

> *"It appears multi unit housing demand is also being driven by the growth of lone person households, and lower income two parent and single parent families predominantly renting. The rental preference is probably a result of income insecurity and falling real household incomes…..if household income trends continue, demand for rented multi units will grow, but will slow as the growth in lone person households declines. Again it is difficult to see where any growth in owner occupiers is going to come from." (Planning Research Centre 1998, Vol.1:3).*

And in the Outer Ring:

> *"As with the Middle Ring it appears multi unit housing demand is being driven by the growth of lone person households, and lower income two parent and single parent families: predominantly renting…..There is no evidence of a significant change in housing preferences on the part of particular household types…demand…will continue to accelerate as more low and moderate income group and lone person households relocate due to economic pressures." (Planning Research Centre 1998, Vol.1:5).*

In 2001 Yates published a more conceptual analysis on the contribution of urban consolidation to housing affordability and choice in Sydney and Melbourne. Her assumption was that:

> *"The housing decisions made by each new cohort of households will depend on the constraints imposed by their socioeconomic circumstances, and on their preferences and the options available to them when they enter the housing market. These options will be strongly influenced by the way in which urban growth has affected the structure of the housing market" (Yates 2001: 503).*

The article examined Census data for 1986 and 1996 on dwelling types and sizes, tenure, household income/age by inner, middle and outer zones. It concluded that income was the dominant influence in determining household decisions about location, dwelling type and tenure and in the reconciliation of these: "(W)hilst an increasing number of households have opted for higher density housing options, they have done so only when constrained by income in meeting their location and tenure preferences." (Yates 2001:516). Thus the article noted that an increase in incomes by high income households in the inner areas had protected them from increased housing costs. Growth in the high density housing stock had enabled such households to satisfy their dominant preferences for home ownership and more central locations. But the households which experienced lower incomes in 1996 than their equivalent cohort in 1986 "faced higher dwelling prices and rents in areas that previously were relatively affordable...(and)…have been constrained increasingly to outer locations, to higher density dwellings and rental housing" (Yates 2001:516).

Such outcomes suggest that the policy assumptions of planners and governments, and the production decisions of developers will determine the provision of dwelling stock under the rubric of urban consolidation. How far these will satisfy preferences and needs will be mediated by the economic constraints that affect household decisions. As Yates comments "urban consolidation, as it has been implemented, is likely to have had less impact on affordability and less impact on increasing choices for income constrained households than promised by at least some of its proponents." (Yates 2001:516).

All these studies begin to suggest that there are distinctive groups of people who live in the various types of dwellings making up urban consolidation in different localities. Both the Planning Research Centre and Judith Yates necessarily used coarse spatial constructs and generalised household characteristics while Gooding's research used Census data on selected census collectors' districts to construct a social profile of the consequent need for human services.

Research on the local impacts of urban consolidation by the Urban Frontiers Program

In 1999 the Urban Frontiers Program commenced a study of the local impacts of urban consolidation policy in three councils to the south and south west of Sydney. These were Hurstville, Sutherland and Campbelltown as shown in Figures 3 to 6. In Hurstville, the municipality had been developed many years ago, and urban consolidation was characterised by the redevelopment of the previous dwelling stock.

In Campbelltown, the experience has been one of the insertion of medium-density development in the initial process of urbanisation in a new city on the urban fringe. Sutherland fell somewhere in between with greenfields development occurring at the same time as redevelopment of older areas, particularly around designated town centres of different character (Urban Frontiers Program 2001, Bunker *et al* 2002).

This study categorised five different kinds of urban consolidation or densification into medium- or high-density configurations:

- **Dual occupancy** was defined as two independent buildings on a single allotment. The allotment may be subdivided if it is large enough. The dwellings may be in the form of an extended single house under one roof, two separate dwellings, or two new dwellings attached side by side or one above the other.
- **Multiple small lot housing** referred to separate dwellings each with their own title, but usually smaller than is normal for separate houses, built on small lots and arranged in groups.
- **Townhouses and villa home**s were self contained dwellings with open space, attached one to another in groups or in clusters. Villas were generally single storey, and townhouses usually of two or (more rarely) three storeys. This type often took the form of semi-detached dwellings (shared common wall but separate lot and facilities), or row or terraced houses (three or more attached houses sharing common walls but with separate lots).
- **Housing for the aged and disabled** referred to purpose rather than form so that the type of dwelling could vary widely. However, they were usually arranged as attached dwellings in groups of varying size, and of single, or more rarely two storey construction.
- **Flats and units** consisted of attached dwellings in various configurations of height and number within an individual building. They shared some common arrangements of access, facilities and open space.

The research went on to define eight different case study areas which had experienced concentrated urban consolidation from an analysis of development applications in the period 1981 to 1996. An examination of the population characteristics and trends in these case study areas, together with the kinds of urban consolidation experienced in them suggested that the different locations studied served at least five broad functions that overlapped to some extent. Each case study area could serve one or more of these roles.

- The first was in accommodating migrants in the process of establishing themselves in Australia. These were most prominent in Hurstville which offered a highly accessible location in a middle suburb undergoing rapid and continuing redevelopment. Between a third and half of their populations were born overseas, many in Asia and the Middle East. The role of these areas and the dwellings they provided in helping to build a multicultural society is obviously a significant one.

- The second function was probably increasing in importance as the population structure ages. A part of the higher density market offered features, facilities and standards regarding security, private living space, amenity and

convenience that were particularly attractive to a growing elderly population whose life experience had enabled them to buy their own home and thus have the capital to move into dwellings more suited to their needs.

- Overlapping and extending this function was one where a locality offered a reasonable variety of dwelling types and price structures so that a mature population 'ageing in place' had opportunities to move into medium-density dwellings in an area in which they have lived for most of their life.

- A significant number of young people were living in some of the case study areas characterised by high proportions of home units, flats, villas and town houses. These were often renting, but there was also some evidence of home purchase.

- Finally, there was a sub-market that provided cheaper housing accommodating households in difficulty, associated with rental. These included low-income households (including single parent families), or those not easily able to find employment. Campbelltown in particular had strong representation of people of this kind.

The second and third of these roles involved more owner-occupation than the first, fourth and fifth, which were typically associated with accommodation rented from private landlords.

All these studies have indicated that different types of urban consolidation and different locations satisfying different housing preferences and needs. The Urban Frontiers Program research elucidated this most clearly because of its differentiation of the different dwelling types making up medium- and high-density housing, and its fine-grained spatial framework in the case study areas. However, while the data on dwelling types derived from the registers of development applications held in the three councils could be reasonably compared with the Census data on population and housing, there could not be an exact fit. Further, the study suffered from the same characteristic as the others cited in that it compared trends in population growth with changes in the dwelling stock in a defined spatial framework. It did not have data on who actually lived in the various forms of attached housing.

3.   SYDNEY'S CHANGING DWELLING STOCK: COMPOSITION, PRICES, RENTS, TENURE

Due to inter-censal definitional changes, it is only possible to distinguish 'separate houses' from 'other residential dwellings' in looking at changes in Sydney's dwelling stock over a long time period. Despite the active promotion of consolidation policy over the last two decades in Sydney, the proportion of the housing stock accounted for by the 'other residential' category did not exceed that of 1971 (33.0 per cent) until 2001 (36.0 per cent) as can be seen from Table 1, although it had been growing from a low point of 29.8 per cent in 1986. In fact, as Figure 1 shows, in terms of residential building approvals, higher density housing overtook separate houses as the dominant form of construction in the early 1990s in Sydney. The trend has been maintained ever since.

Figure 1: Separate House and 'Other Residential' Building Approvals in Sydney SD, 1983-84 to 2002-03
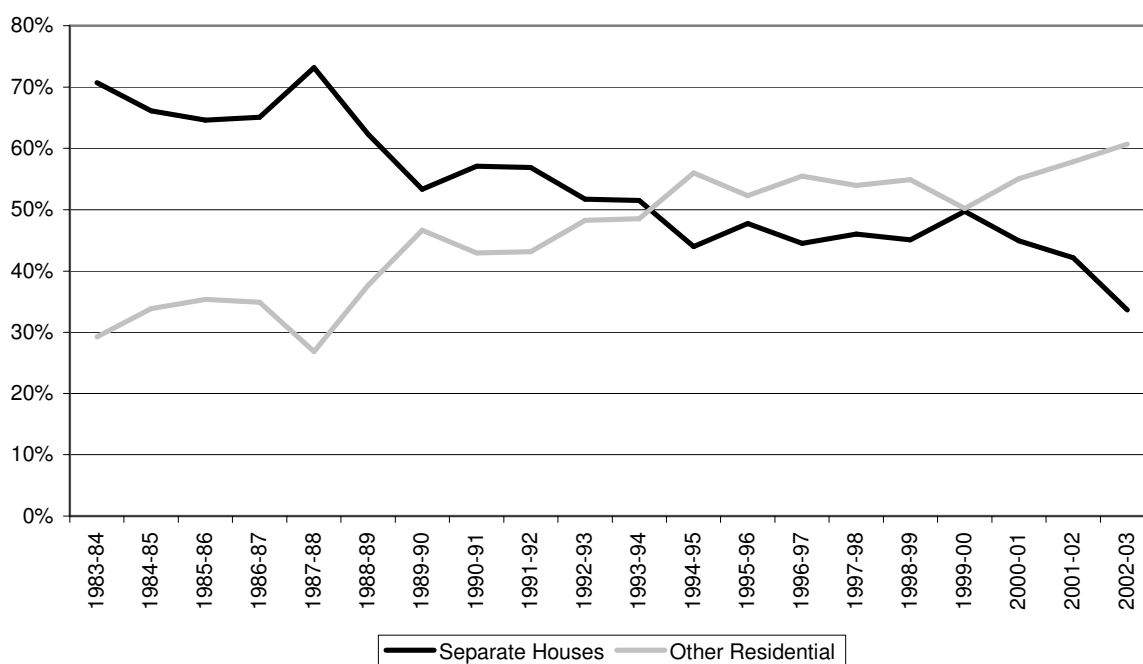
(source: ABS, Building Approvals NSW and ACT, Catalogue No. 8731.1)

Earlier processes of urban consolidation in Sydney tended to favour 'dual occupancy' where two independent dwellings could be built on a block, or walk-up flats of 2-3 storeys. In the decade 1991-2001 however, the emphasis was much more on the building of semi-detached or similar dwellings. Further they have increased in size so that well over half of them are of three or more bedrooms in 2001.

There has also been a marked increase in high-rise flats. This reflects the development of a high-rise luxury apartment market in the centre and inner suburbs of Sydney. Nevertheless the flat or unit in a complex of less than four storeys is still the most common type of attached dwelling and has a widespread distribution over Sydney.

The growth of the total dwelling stock in this way thus increased the number of smaller dwellings, those available for rental, and for a generally lower cost than for separate houses. Further, as Figure 6 shows, attached dwellings now comprise more than half the dwelling stock in central and inner Sydney and significant proportions in middle and even some outer suburbs.

Figure 2 explores the effects of this changing character of the dwelling stock in terms of trends in house and unit prices and rents over the period 1991-2003. Notably while median unit and house prices have increased by a similar amount of about 160 per cent, rents have grown much less, especially for houses. On this evidence, it would appear that the increased supply of higher density housing is leading to lower rent levels. However other factors could also account for this phenomenon such as the shifting location of urban consolidation to less salubrious areas; the focus on capital gains by investors meaning that substantial rent increases might be eschewed; and the inability of low income earners to pay increased rents.

Figure 2: The change in Rents, Sales Prices and Earnings between 1991 and 2003
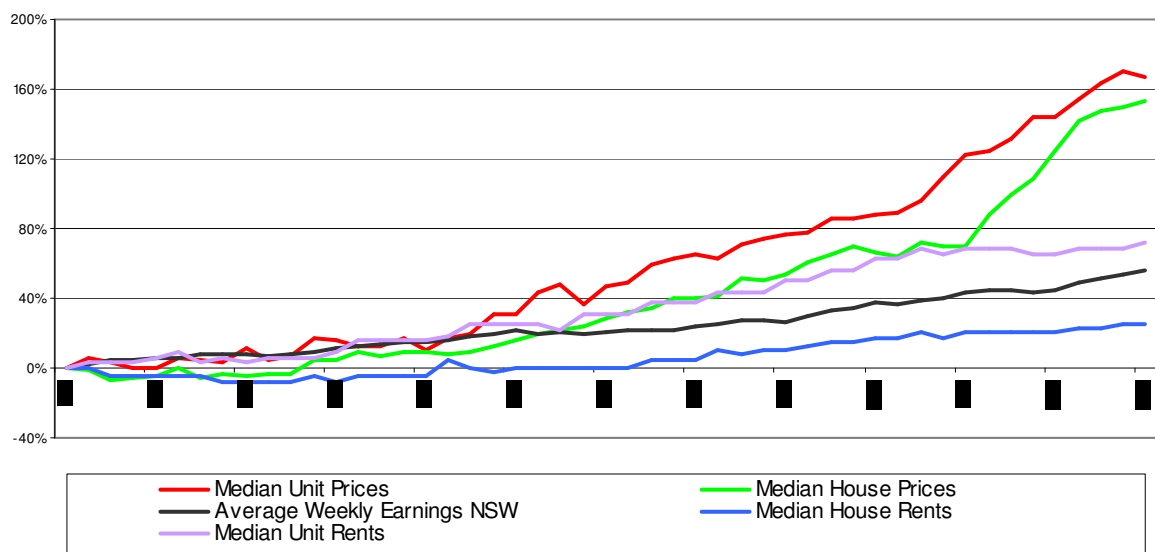
(source: ABS Average Weekly Earnings NSW, Real Estate Institute of Australia, NSW Department of Housing Rent and Sales Reports)

Whether for eventual owner-occupation or sale for capital gain, the increase in higher-density housing has helped to raise the proportion of the dwelling stock available for rental. The percentage of all dwellings owned by their residents remained virtually static over the decade 1991-2001 at 39.0 per cent, while the percentage purchasing dwellings dropped from 26.4 per cent to 23.7 per cent (Tables 6 & 7). Correspondingly the proportion of people renting rose from 28.1 per cent to 29.0 per cent, but the proportion renting public housing within this dropped slightly from 5.8 per cent to 5.1 per cent. How far this shift to private rental is a matter of choice or of necessity is an issue for further research.

Changes in Sydney's dwelling stock 1991-2001

As noted previously, Sydney recorded its the lowest proportion of attached dwellings in the housing stock at 29.8 per cent in 1986, and this percentage has grown ever since as urban consolidation policies have developed and taken effect. After 1991 it becomes possible to make a more detailed analysis of trends in the growth and change of the housing stock, as Census definitions of different kinds of dwelling types became more appropriate and reliable. Consequently in the following analysis we focus on the four different kinds of medium- and high-density housing tabulated in 1991 and 2001. Further, while Table 1 contains data about the whole of the housing stock, the following analyses for 1991-2001 are restricted to **privately occupied** dwellings as they deal with the nature of occupation of dwellings by households.

The growth of medium- and high-density housing

There are four kinds of medium- and high-density housing identified in the 1991 and 2001 Censuses. These are semi-detached; row, terrace and townhouse dwellings (hereafter called 'semi-detached'); flats, units and apartments in configurations of less than four storeys (or low-rise flats); those of four storeys or more (high rise flats); and those attached to a house. Of these the first three are the most important by far, and represent a successive increase in density. It should be noted that the dual occupancy form of urban consolidation to which reference has been made is only partly included in either the first or last category and only when such independent dwellings are attached to another.

Table 2 shows the numbers and percentages of these different dwelling types in the Sydney Statistical Division in 1991 and 2001. These figures confirm the densification of Sydney over the decade. Attached dwellings accounted for 35.2 per cent of the dwelling stock in 2001, up from 30.4 per cent in 1991. Every category of attached dwellings increased its market share, apart from the small number of flats attached to a house. The number of semi-detached and similar dwellings increased by 52 per cent from 106,697 to 162,320; those for flats in blocks of less than four storeys by 24 per cent from 174,634 to 217,317; and flats in blocks of four storeys or more by 45 per cent from 82,839 to 120, 452. In contrast the proportion of the dwelling stock in separate houses fell from 67.5 per cent to 63.1 per cent in the decade and there was only a 10 per cent increase in their number from 823,721 to 907,195. In fact attached dwellings accounted for 62 per cent of the net increase in private dwellings in Sydney. Despite the lower rate of increase of flats of less than four storeys in this decade, this kind of dwelling is still the second most common form of housing. It represented 15.1 per cent of the housing stock in 2001. This reflects the large number of such dwellings built in the earlier years of urban consolidation.

Spatial impact of consolidation

Despite these changes however, separate houses still dominate Sydney's housing market. But higher density forms have made a distinctive spatial impact on the metropolitan housing market. This can be shown in some detail by suburb in Figures 3 to 6. These maps are of Urban Sydney and depict the continuously built up area of Sydney within the larger Statistical Division represented in the tables. The maps illustrate the varying spatial impact of the three basic forms of urban consolidation – semi-detached and similar dwellings, low-rise and high-rise flats.

Figure 3 shows the widespread distribution of local concentrations of semi-detached and similar dwellings across Sydney: a common form of development in inner suburbs west and south of the city centre in the early part of the twentieth century. There are also concentrations along the main communications routes to the south, west and south-west. Much of the strong growth in this form of dwelling in the 1991-2001 decade has taken place in these outlying suburbs, some of it as public housing.

The building of low-rise walk-up flats was popular for much of the second half of the twentieth century and Figure 4 reflects the importance of this type as a form of residential redevelopment in the inner and middle suburbs. Some concentrations in the central districts of Fairfield, Liverpool, Bankstown, Parramatta, Hornsby and Penrith are also noticeable. The attraction of coastal locations is also apparent.

As has been noted, the number of dwellings in blocks of four storeys or more has increased by almost half over the period 1991-2001. Figure 5 shows their concentration in 2001. These clusters are fewer in number than in the other maps and with a much greater focus on higher value inner city and eastern suburban locations. The development of concentrations around railway stations in a few suburban town centres such as Hurstville, Sutherland, Parramatta and Chatswood is also noteworthy.

Figure 6 presents the totality of the attached dwelling stock in 2001. Significantly the suburbs of inner and eastern Sydney have more than half their housing in this form. This also applies to important outlying areas such as Hornsby, Warriewood, Liverpool, Parramatta, Bankstown, Sutherland, Cronulla and the western shore of Botany Bay. Lesser concentrations of attached dwellings elsewhere reflect low-rise walk-up flats, or more recent semi-detached and similar forms.

Figure 3: The proportion of dwellings in each suburb that are semi detached, 2001
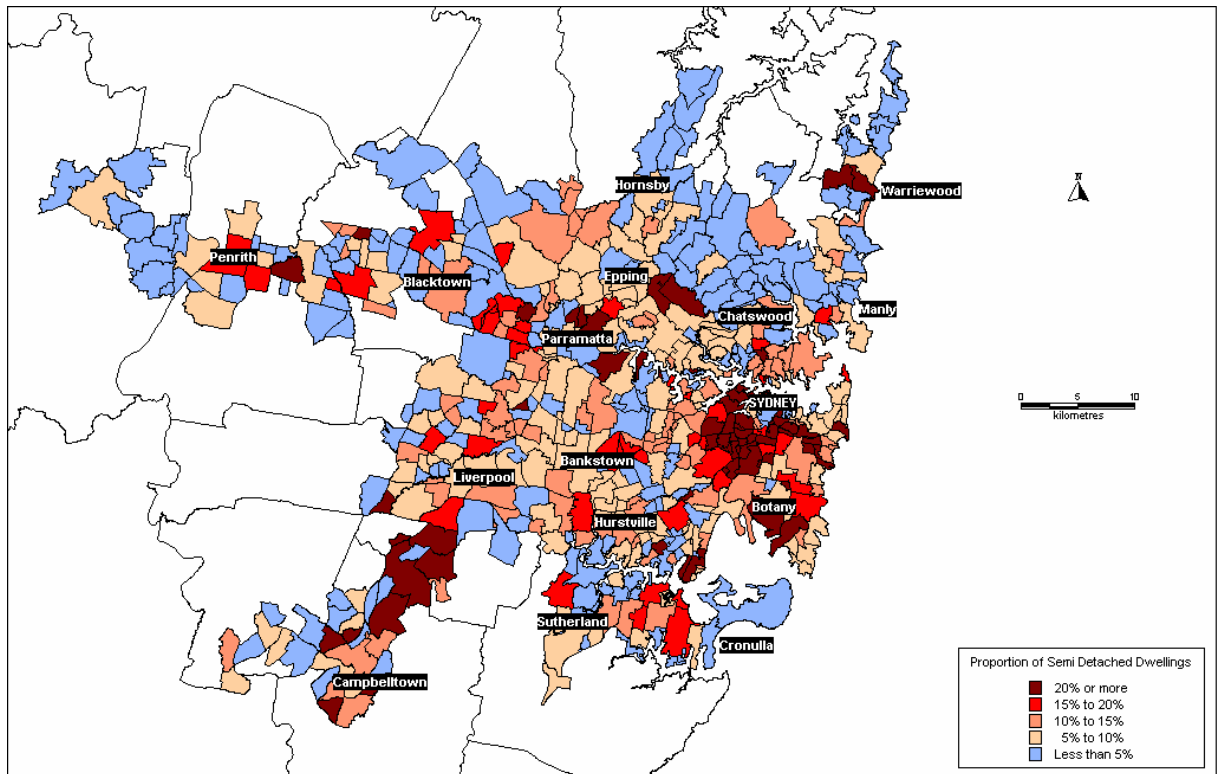
(source: ABS, CDATA2001)

Figure 4: The proportion of dwellings in each suburb that are flats in a block of less than 4 storeys, 2001
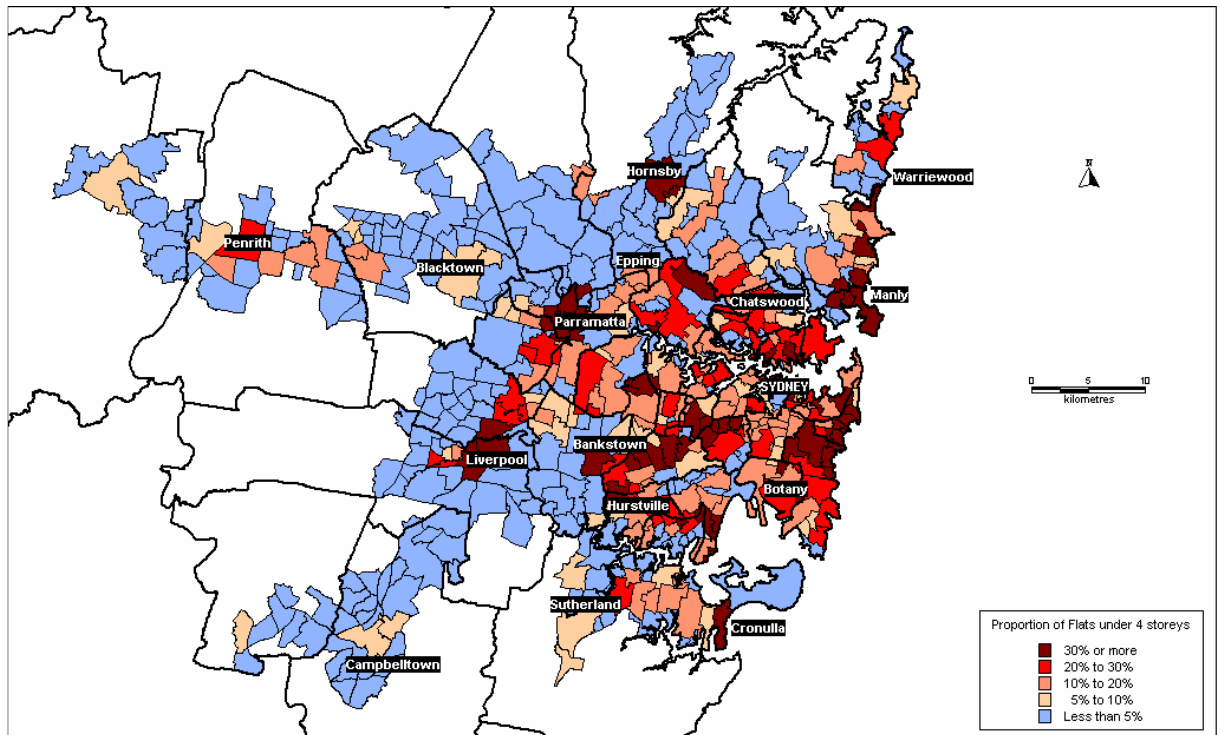
(source: ABS CDATA2001)

Figure 5: The proportion of dwellings in each suburb that are flats in a block of 4 or more storeys, 2001
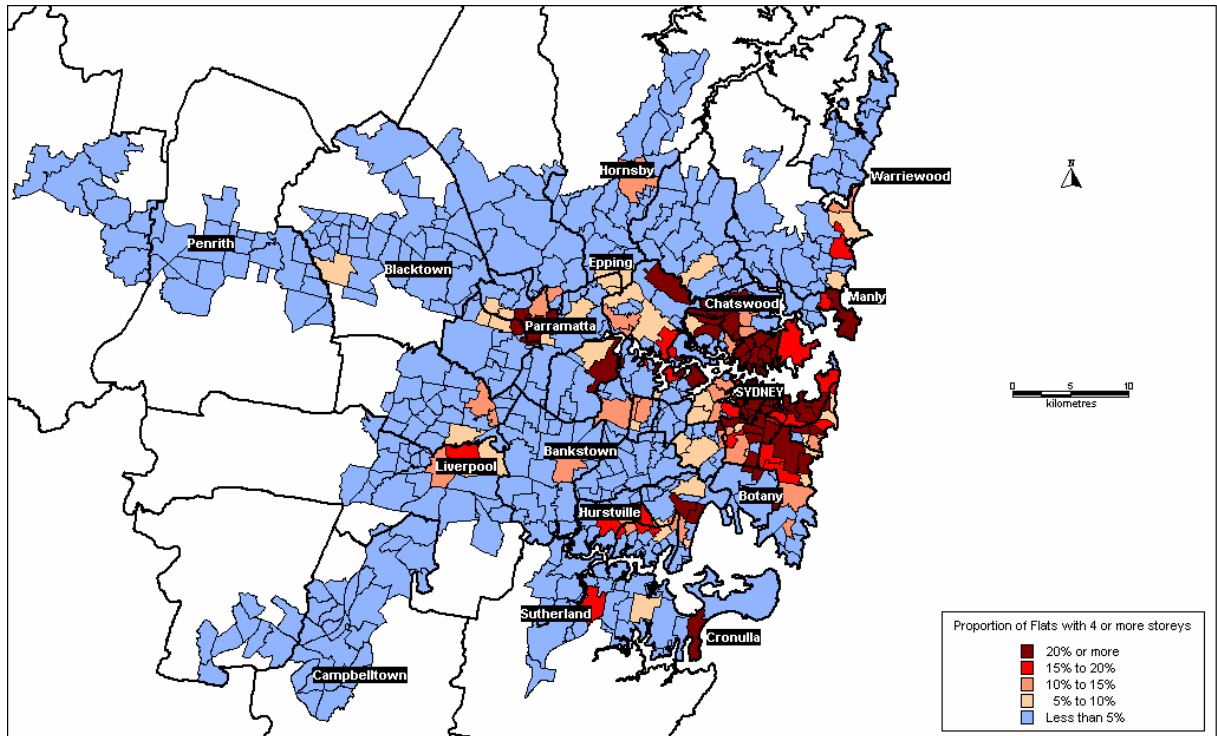
(source: ABS CDATA2001)

Figure 6: The proportion of dwellings in each suburb that are multi-unit dwellings, 2001
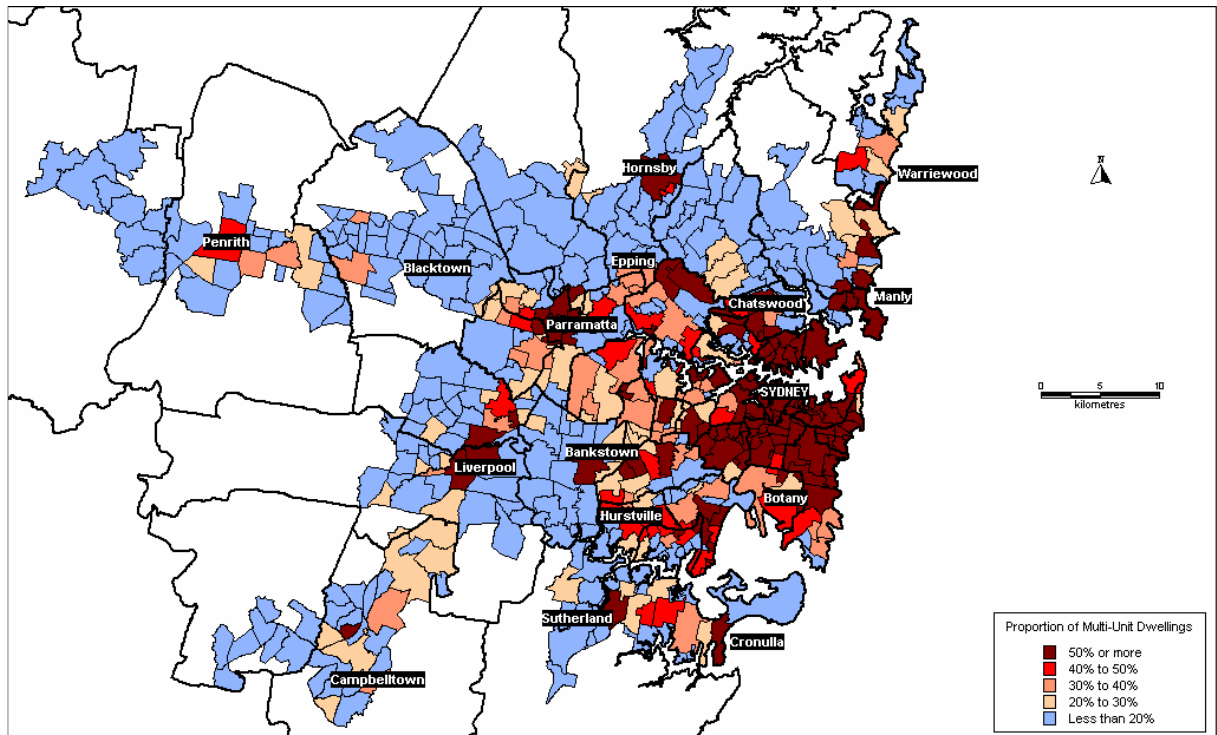
(source: ABS CDATA2001)

Size of different dwelling types

One of the arguments supporting urban consolidation is the trend to smaller and more mobile households who would benefit from a larger number and variety of smaller dwellings. Ironically while that kind of change in the dwelling stock occurred over the decade, the average size of dwellings of every type has grown, as noted by Yates (2001) for the period 1986-96. Table 3 shows the numbers of bedrooms in each type of dwelling and Tables 4 and 5 the percentages either by dwelling structure or numbers of bedrooms by each housing type. Of the attached dwellings, semi-detached dwellings were the largest and in 2001 55.8 per cent were of three bedrooms or more. In the decade considered, this proportion had risen from 44.2 per cent in 1991, meaning that construction of this kind of dwelling over the decade was of much bigger types than previously.

As might be expected, flats, units or apartments were smaller in size. Of those arranged in configurations of less than four storeys, 83.6 per cent had two bedrooms or less in 1991, but this proportion had fallen to 79.8 per cent by 2001 as more dwellings of three bedrooms or more of this type were built. In high-rise flats of four storeys or more similar trends were evident and the increase in the number of larger high-rise flats of three bedrooms or more was most striking, almost doubling in number from 8,725 to 15,148 and reflecting the growth in larger flats or apartments at the upper end of the market. These trends provide little evidence for the assumption that the growing numbers of smaller households need smaller dwellings.

In passing, it should be noted that the same trends occurred in separate houses, with the proportion of those with three or more bedrooms rising from 80.0 per cent to 85.0 per cent in the period.

Tenure characteristics

A key characteristic of the higher-density market is that it is predominantly built for rental not for home ownership. This was one of the arguments for those supporting urban consolidation in that renting suited those who moved more frequently, than those buying or owning a home. As discussed later the changing profile of society together with decreasing affordability of housing means that renting is likely to become more common.

Tables 6, 7 and 8 show the tenure type of those living in different kinds of dwellings at the two Census dates. Comparison of the tables show the proportion of all dwellings being rented rose while the percentage being purchased dropped. Those owned outright remained about the same at 38.9 per cent. Compared to houses, of which 78.2 per cent were either owned or being purchased in 2001, the proportion of ownership in higher-density stock is much lower. In fact ownership rates were about half for semi-detached dwellings, dropping to 28.8 per cent for low-rise flats and 31.3 per cent for high-rise flats.

In the same year 59.1 per cent of the flats of less than four storeys were rented, mainly from private landlords, and the figure was 54.2 per cent for those flats of four storeys or more. These percentages are high given the considerable proportions in the 'not stated' category especially in the higher blocks. The latter issue is clearly one that the ABS will need to address in the next Census. Despite the impact of these undefined

tenures, Figure 7 demonstrates the high proportion of attached dwellings which are rented either from private landlords or a government authority.

Recalling that 62 per cent of the increase in the dwelling stock 1991-2001 took place in the form of attached housing, it can be seen from Tables 6 and 7 that 72 per cent of the net increase in private rental housing was accounted for by medium- and high-density forms.

Figure 7: Dwelling tenure by dwelling type, Sydney, 2001
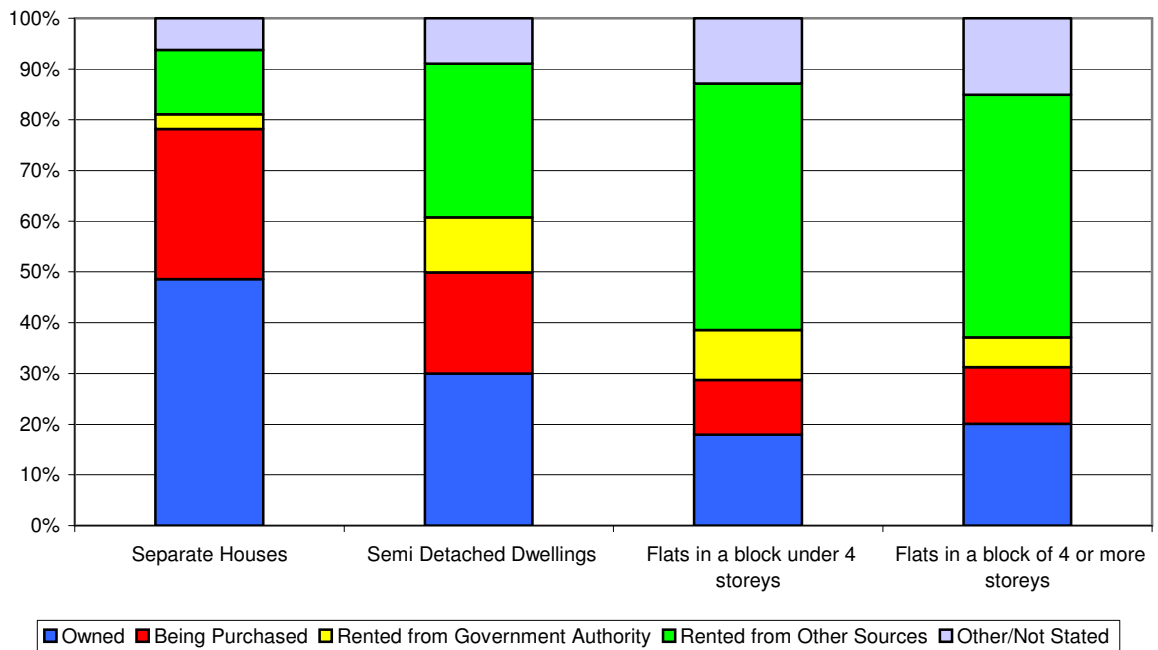
(source: ABS Special Request Matrix, Census of Population and Housing, 2001)

4.   WHO LIVES IN WHAT DWELLING?

The Census collects much more information on population than on housing. By obtaining special tapes, it is possible to analyse the kinds of people living in the expanding stock of attached housing of various types. Is it possible from this to define households with certain characteristics, which reflect a propensity to select attached dwellings in which to live? And can this be differentiated further within the three main types of attached dwellings?

This section analyses the more important variables which appear to affect living in medium- and high-density housing. There are some characteristics, such as occupation and educational qualifications which have no significant correlations with dwelling type at the Statistical Division level and they are not discussed here, although such associations can be important at a more detailed spatial scale, as the later section on housing sub-markets shows.

The basic data are represented in the tables for each characteristic of the residential population such as age, type of household etc. These data are shown in terms of absolute numbers; percentage changes in these over the decade (where appropriate); the percentage distribution of populations in each dwelling type; and the percentages of the particular population in each dwelling type.   As with the dwelling stock we start with a general overview to set the stage and continue with an analysis of the characteristics of people living in the dwelling types representing urban consolidation in 2001.

Overview: changes in the residential population of Sydney

The profile of the Sydney population is changing in important respects. Much of this reflects secular changes that are occurring in Australian society such as an ageing population and a declining birthrate (ABS 2003). Some of these trends are particularly accentuated or apparent in Sydney such as a concentration of people born outside Australia (ABS 2002). They are also differentially represented in different parts of Sydney.

The main changes include an increasingly multi-cultural character in that the proportion of people born in Australia or the UK/Ireland has fallen. The population is ageing, and the percentage of single- or two-person households is increasing. The proportion of children in the population has fallen, but there has been a marked increase in the numbers and proportions of lone-parent households.

The population has a high degree of mobility with about a third of the 2001 population not living at their present address in 1996 and another 6.1 per cent being overseas at that time.

Lone-person and group households

Tables 9, 10 and 11 show the kinds of households living in the different types of dwelling. The major type of household is that containing one, two or three families and these are further analysed in Tables 12, 13 and 14.

Lone-person households are one of the fastest-growing, reflecting demographic and social circumstances (ABS 2003, McDonald 2003). As Table 9 shows, in the decade 1991-2001 their number grew from 237,258 to 305,672 in the Sydney Statistical Division or by 29 per cent. In the latter year they represented 21.3 per cent of the households in the Division. Such households have always been under-represented in separate houses, but that pattern intensified over the decade. The major shift was in the increase in the proportion of lone-person households living in semi-detached dwellings to 14.3 per cent as Table 11 shows. Figure 8 demonstrates the change in dwelling preference by such households over the decade with this marked shift. However most lone-person households of this kind living in attached dwellings were housed in flats of less than four storeys: their number almost equalling those in the other two main types considered. The overall proportion of lone-person households living in both low-rise and high-rise flats remained static over the decade at 41.8 per cent in Sydney.

Figure 8: The percentage change of lone-person households by dwelling preference in Sydney SD, 1991-2001
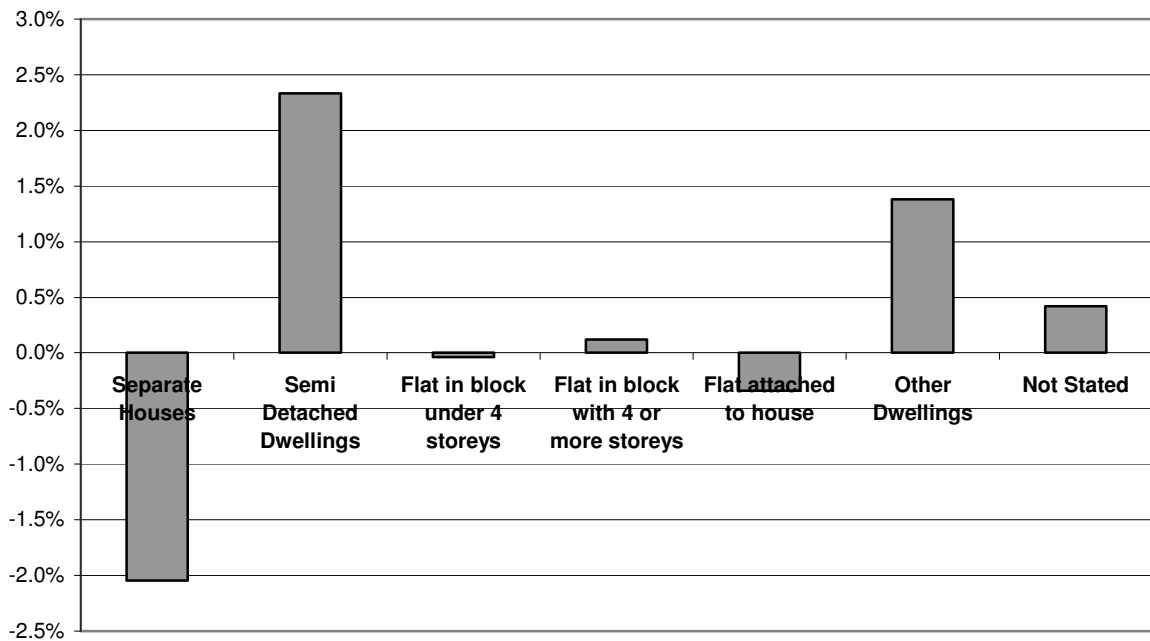
A group household is one consisting of two or more unrelated people where all persons are aged 15 years and over. Common examples are students living together in a large dwelling, or unrelated flatmates, not couples living together to reduce housing costs. Over the decade these have declined in number by 7 per cent, and such households, not unexpectedly live mainly in attached dwellings. 28.0 per cent lived in low-rise flats at both Census dates as Table 11 shows, but the proportion in other kinds of attached dwellings rose from 30.7 per cent to 35.3 per cent in the period.

Households made up of a family or families

Families of different kinds form the most common type of household, and so it is important to analyse them further. The basic data are shown in Tables 12, 13 and 14.

From 1991 to 2001 there was a 7 per cent increase in couples with children, a 24 per cent increase in couples without children, a 30 per cent surge in one-parent families and a 5 per cent increase in other family types in the period 1991-2001.

From Table 14 it can be seen that 86.0 per cent of couples with children lived in separate houses in 1991 and 67.0 per cent of one parent families. There were declines in these proportions over the decade but that has been compensated for by an increase in the use of semi-detached dwellings, but not flats. The Table also shows that in 1991 the proportion of couple families with children living in attached dwellings was 12.7 per cent, and this had risen to 16.2 per cent in 2001.

These proportions were much higher for one parent families at 31.4 per cent in 1991 and had increased to 32.5 per cent in 2001. Figure 9 shows this trend reflects a change in dwelling preference from every other type of housing into semi-detached forms. This extensive use of attached housing by lone-parent families probably reflects the low incomes of many such families and their low assets after separation from a partner.

Figure 9: The percentage change of one parent families by dwelling preference in Sydney SD, 1991-2001
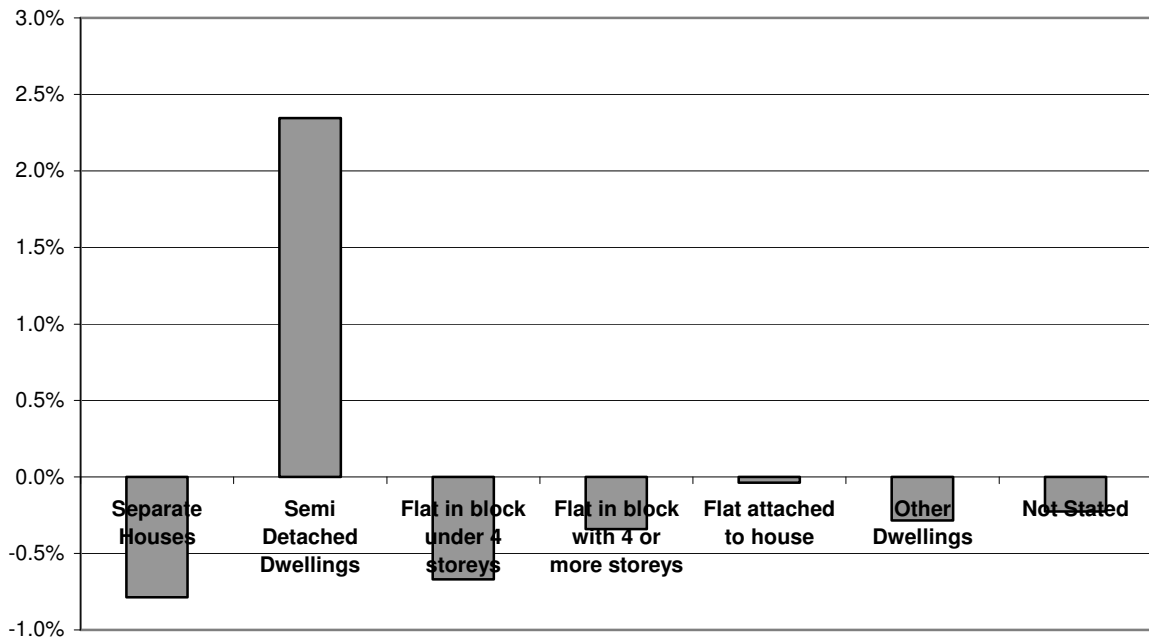
Age

Tables 15, 16 and 17 give the numbers and percentages of people in various age groups at the two Census dates and the kind of housing they lived in. They also demonstrate the ageing of the population in the decade. Especially noticeable is the growth in the baby-boomer cohort of those aged 45-64 from 19.6 per cent to 22.4 per cent of the population. Table 17 shows the percentage of each age group living in the different dwelling types.

There is further elaboration here of trends mentioned above. From Table 17 while the vast majority of children aged 0-14 lived in separate houses, the proportion had fallen from 83.7 per cent in 1991 to 79.1 per cent in 2001. However, as Tables 16 and 17 show, there were substantial numbers of children living in attached housing, comprising 18.2 per cent of the population living in semi-detached and similar dwellings in 1991 and 18.5 per cent in 2001; 13.8 per cent of those in flats of less than four storeys in 1991 and 14.2 per cent in 2001; and 9.8 per cent in high-rise flats in 1991 rising to 10.7 per cent in 2001. As can be seen, all these proportions had increased slightly since 1991. In all, the number of children in attached dwellings increased by 48,786, or 45 per cent over the decade. Put another way, 15.1 per cent of children in Sydney lived in attached housing in 1991: the proportion stood at 19.8 per cent in 2001. Figure 10 illustrates this change in dwelling preference over the decade but must be set in the context of the increasing proportion of the housing stock in the form of attached dwellings.

Figure 10: The percentage point change of persons aged 0-14 years by dwelling preference, Sydney, 1991-2001
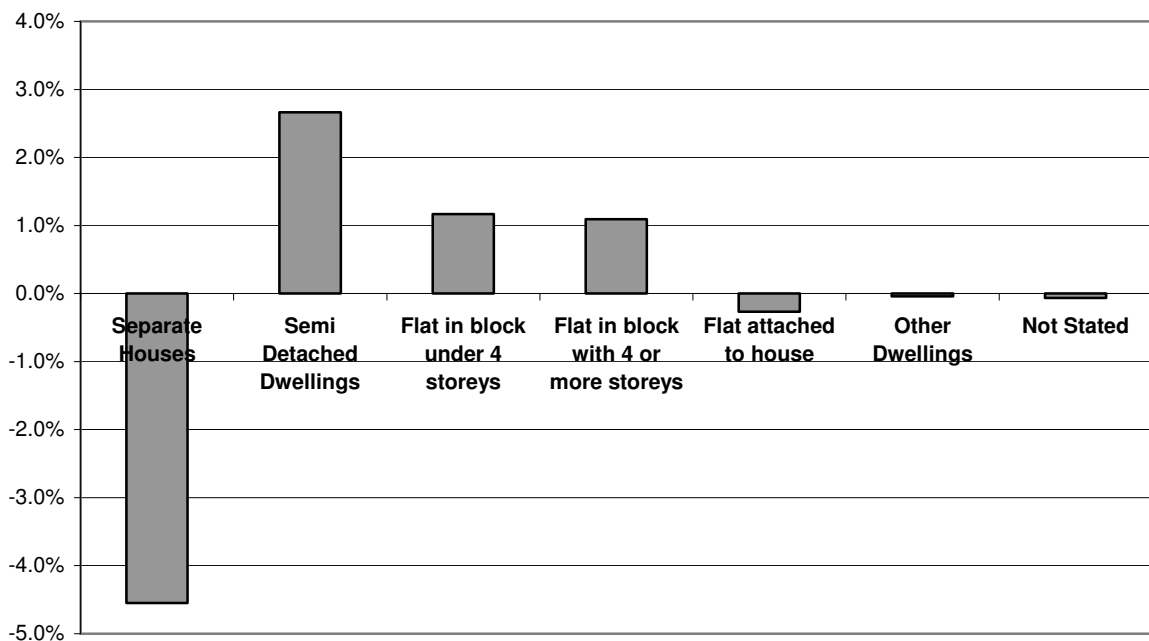
The population aged 25-34 is substantially over-represented in all types of attached dwellings. From Table 17 the proportion of those aged 25-34 living in such dwellings rose strongly from 32.5 per cent in 1991 to 39.8 per cent in 2001. Figure 11 illustrates this change in dwelling preference. Some 68.3 per cent of those aged 65 and over lived in separate houses in 2001 as compared with 70.8 per cent in 1991, while the proportions living in semi-detached housing rose in the period from 8.6 per cent to 10.5 per cent, and in flats of less than four storeys from 12.0 per cent to 12.6 per cent. Given the ageing of the population, it is important to analyse these trends further, and Figure 12 shows the change in dwelling preference by those aged over 65 between the Census dates. Despite the small increase in living in a flat attached to a house shown in this Figure, Table 16 shows that the percentage of these dwellings occupied by

those aged 65 and over jumped from 5.2 per cent in 1991 to 12.3 per cent in 2001. So-called 'granny flats' would be included in this category.

Figure 11: The percentage point change of persons aged 25-34 years by dwelling preference, Sydney, 1991-2001
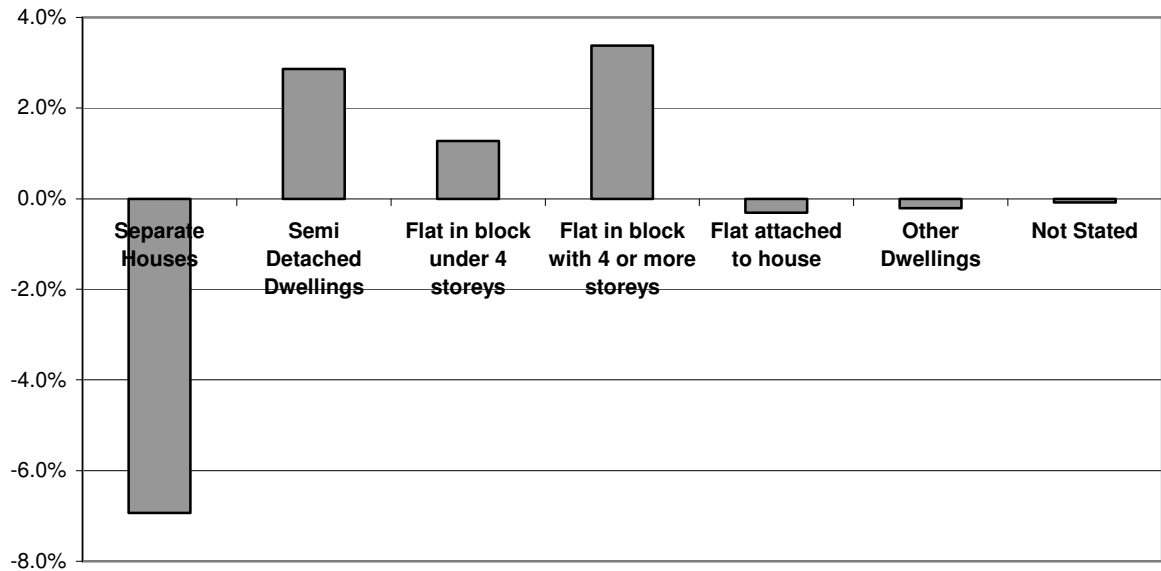
Figure 12: The percentage point change of persons aged over 65 years by dwelling preference, Sydney, 1991-2001
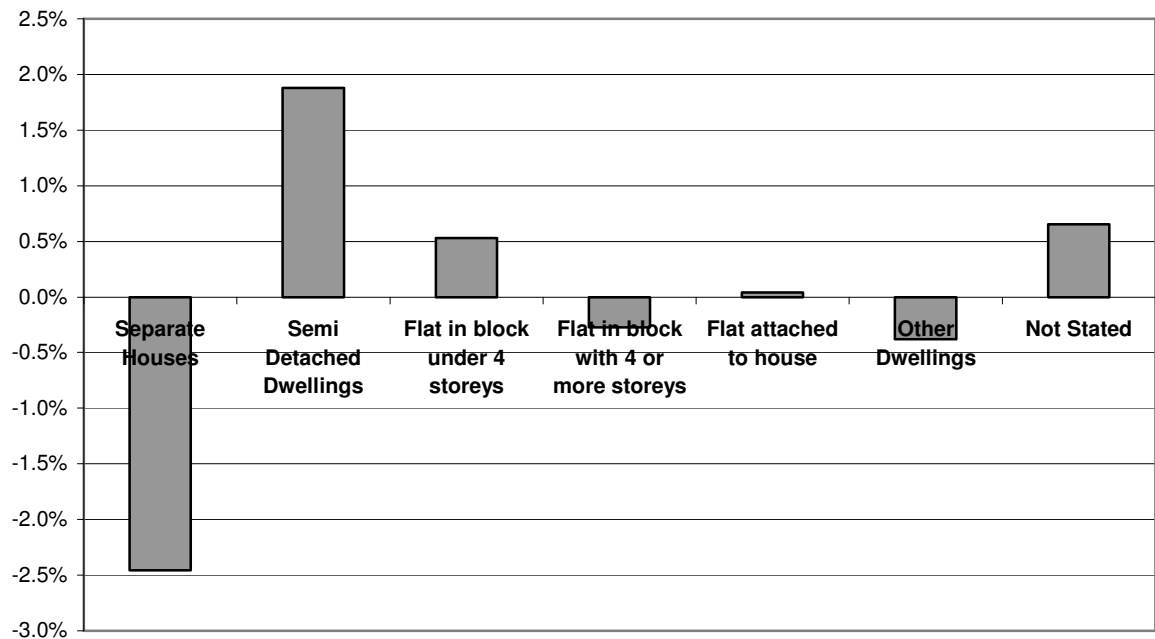
Household Income

Rather than analyse the entire income range, Table 18 shows the distribution of households at opposite ends of the income scale among the different dwelling types. In all 44.8 per cent of households with an income of below $400 a week lived in attached dwellings. While some of these would be renting from a public housing authority, the bulk are likely to be private renters. On the other hand, of those households with incomes of over $2000 a week nearly three-quarters lived in separate houses in 2001, and they are conspicuously over-represented in this kind of dwelling. By comparison with Table 2 it can be seen that this is compensated by the lack of popularity of low-rise flats with them. However, their use of semi-detached and high-rise flats is in proportion with their numbers.

Figure 13 shows the proportion of households by income category in each dwelling type in 2001. Attached dwellings are especially important in providing housing for those households earning less than $300 a week. For households earning between $400 and $1,200 a week there is a similar propensity to live in the various dwelling types. For households on higher incomes than that there is a clear preference for living in separate houses or high-rise apartments.

Figure 13: The proportion of households by income category for selected dwelling types, 2001
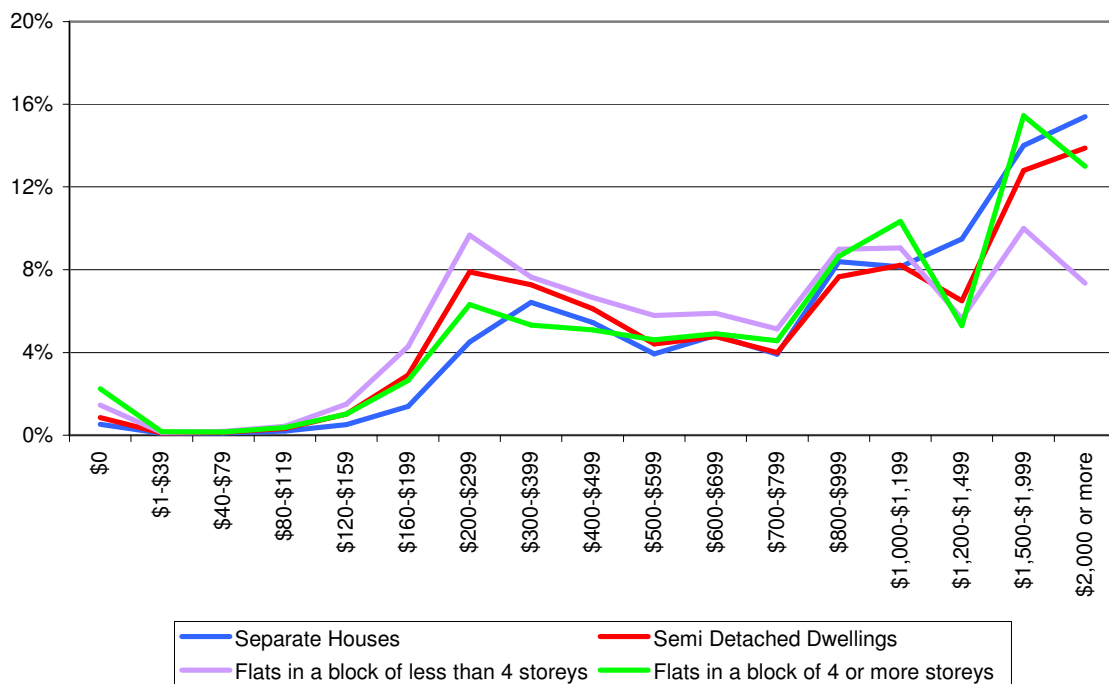
Mobility

Table 19 gives the number of people living in different dwelling types who had not moved in the period 1996-2001, those who had, and those who were overseas in 1996. There was a substantial 'not stated' and 'not applicable' component, which means the defined categories are under-stated. From the last column in the Table it can be seen that just under half of Sydney's population had not moved in the previous five years.

Clearly, people in attached dwellings are substantially more mobile than those in houses. Overall, only 30.6 per cent of people in attached dwellings had not moved in the five years before 2001, compared to 56.7 per cent of those living in houses. The figure was as low as 23.5 per cent for those in high-rise flats.

Just as significantly, while 6.1 per cent of Sydney's 2001 population was overseas in 1996, the figure for residents of low-rise flats was 15.5 per cent, and for those in high-rise flats it reached 18.4 per cent - almost one in five. Nevertheless over a quarter (28.0 per cent) of all residents who were overseas in 1996 were living in low-rise flats in 2001. Put another way, just 38.7 per cent of those living overseas in 1996 occupied separate houses in Sydney in 2001: the rest were almost entirely in attached dwellings.

Birthplace

This is an important variable given immigrants from overseas are likely to seek less commitment in their first choice of housing type, tenure and location partly because of uncertainty about conditions in Sydney, and partly because many of them have limited capital or assets on arrival in Australia. Tables 20, 21 and 22 show these data. In comparing the two Censuses, two important points need to be recognised.

First, from Table 21 the 'not stated' category rose from 0.6 per cent to 6.1 per cent in the two Censuses. This seems due to a number of factors. There is the difficulty in contacting people in the increasing numbers of attached dwellings for a number of reasons including the fact that they are more likely to move or be absent. There is also an increasing reticence about disclosing birthplace from some countries because of the unnecessary stereotypes and stigmas attached to them.

Second and again from Table 21, there has been an overall decline in the decade in the percentages of people born in Australia or the UK/Ireland. These proportions have dropped from 68.7 per cent to 59.3 per cent and from 6.4 per cent to 4.8 per cent respectively. Conversely increases have occurred in those born in Asia (from 8.4 per cent to 10.1 per cent), in Europe and the former USSR (from 8.4 per cent to 11.2 per cent), and in 'other Oceania', mainly New Zealand (from 2.7 per cent to 3.0 per cent). Those from the Middle East have remained virtually the same at 2.4 per cent and 2.5 per cent at the two Census dates.

Much detailed analysis can be made. From Table 22 it can be seen that 80.3 per cent of those born in Australia lived in separate houses in 1991 and 77.4 per cent in 2001. The next group with a high proportion living in separate houses were those born in Europe and the former USSR, but these had declined from 76.2 per cent in 1991 to 70.4 per cent in 2001.

Those born in the Middle East had proportions of 69.8 per cent and 68.3 per cent living in separate houses at these times. Those from the UK/Ireland had proportions of 71.7 per cent and 68.2 per cent living in separate houses at the Census dates. For those born in Asia the figures were 58.7 per cent and 55.5 per cent respectively. The only group to increase their use of separate houses over the period were those born in 'other Oceania', the percentage rising from 57.8 per cent to 61.7 per cent.

The percentage of those born in Asia living in attached dwellings has risen from 40.1 per cent to 43.0 per cent over the decade. Most of these were in flats.

Weekly rent

Table 23 gives the numbers and proportions of households paying rent at various levels in the different kinds of dwellings in 2001. These data are for rented dwellings only: as noted previously most of the housing stock is owned or being purchased by the occupier.

From this Table it is apparent that lower rents are paid for attached dwellings than for separate houses. This is unsurprising given that such dwellings are smaller than separate houses. However there is clear evidence of the high rents obtained for luxury apartments or those in high-rise central locations. Thus from Table 23 17.2 per cent of dwellings in blocks of four storeys or more are rented for over $400 a week and 24.1 per cent for $300-399. These proportions are higher than for any other kind of dwelling.

Summary

In the broadest sense that those groups of the Sydney population which are increasing in importance are over-represented in different types of attached dwelling, it can be surmised that building attached housing is helping them to find suitable homes. This is true of lone-person households, single-parent families, the elderly, migrants from overseas, the poor, wealthy residents seeking a cosmopolitan and inner city lifestyle, and those changing residence frequently. It should be noted, however that an increasing proportion of children are living in attached dwellings, and some would question the desirability of them living in flats and look for the reasons why.

This general finding depends on broad correlations between population characteristics and dwelling type, and is subject to severe qualifications. The first arises from Yates's research, where it was suggested that lower income households with limited capital are forced into renting attached dwellings because they cannot afford any other type of dwelling. A second reservation would question whether the locations, character and size of concentrations of attached housing are suitable and optimal for those living in them. Such concentrations depend on the policy decisions of planners and the willingness and ability of developers to build attached housing in those identified locations. A third caveat arises from the fact that even from the highly aggregated analysis already described, there are obviously quite different types of people living in attached housing, with a consequent need to define, describe and interpret the presence of such sub-markets.

5. UNPACKING HIGHER DENSITY HOUSING: A FACTOR ANALYSIS OF KEY SUB-MARKETS

If there are distinct profiles of housing need and demand arising from dynamic demographic, social, economic and cultural circumstances, then the research task is to define and locate them. Housing market analysis offers a way of doing this. Much of that work, however has been highly aggregated, and does not capture important localised or neighbourhood markets. Further it has been dominated by economic considerations, principally the cost of housing. It has also tended to be preoccupied with supply-side conditions such as the nature of the housing stock.

More recently, however, researchers have investigated housing sub-markets formed by structural or spatial factors or indeed both (Maclennan & Tu, 1996; Watkins, 2001). Research of this kind in Scotland argued that the very concept of sub-markets relied on a high degree of self-containment, so that most households moving house without changing jobs would move within the same area (Jones, Leishman & Watkins, 2001; Jones, 2002). The emphasis in a housing study carried out in Northern Ireland was on the "three interrelated themes of segregation, socio-tenurial polarisation and sub-markets" (Adair *et al.*, 2000, p.1079). The results showed the importance of these themes and the conclusion that "to sensitise policy to the reality of housing in Northern Ireland, it is necessary to unpack local markets with empirical analysis of the key market drivers, including choice patterns." (Adair *et al.*, 2000, p.1091).

Drawing on these precedents, we construct a research process to define and locate housing sub-markets in attached housing within the overall Sydney housing market. To do this it is argued that these sub-markets are formed by *segmentation* and that each is represented at a *number of locations* so that it is not continuous in space (Randolph, 1991; Galster, 1997; Yates & Wulff, 1999; Bourassa *et al.*, 1999). In identifying these sub-markets we have sought to include a sufficient number of supply-side and demand-side variables to most suitably shape them and also to represent them in space. A fuller account of the theoretical and methodological approach used in defining sub-markets in the attached housing stock is provided elsewhere (Bunker, Holloway & Randolph, 2005b, forthcoming).

Factor analysis

We have used factor analysis as the main method of carrying out this research design, using special cross-tabulations obtained from the Australian Bureau of Statistics. Factor analysis attempts to account for the variation in a number of variables using a small number of index variables, or factors (Manly, 1994), and a detailed account of the mechanics of the process is described in Appendix 2. Basically factor analysis techniques are used to reduce a set of indicators to a small number of new statistically generated variables. Each of these variables is a linear combination of the original variables, and each represents a common underlying factor (Manly, 1994). In essence, the factors represent broad constructs which provide a useful basis for differentiating among geographical areas with similar characteristics.

While there is no universally accepted method or option for analysing housing sub-

markets (Jones & Watkins, 1999) there have been criticisms of factor analysis (see Chatfield & Collins, 1980). In order to side-step some of the concerns associated with factor analysis some researchers have used cluster analysis or multiple discriminant analysis (Bourassa *et al*., 1999). However, these techniques also have pitfalls. Knox (1987), for example, contends that the nature of cluster analysis makes inner city comparisons of residential typologies difficult, and in the search for broad level generalisations about urban residential structure, factor analysis is likely to remain the preferred option.

Census Collectors' Districts (CDs) were selected as the basis for this analysis for several reasons. Firstly, the housing stock in any given urban area is diversified (van Kempen & van Wessep, 1998; Kauko *et al*., 2002). CDs provide the most localised and functional area for which dwelling and socio-economic information is collected. Therefore, CD data allow us to more accurately identify these under-researched local level markets (Chow & Coulton 1998; MacLennan & Tu 1996; Jones 2002). Finally, CDs are not only mappable but allow us to build up a picture of functional housing market areas to assist local policy makers (Jones & Watkins, 1999).

CDs with high concentrations of attached housing were selected, and their population characteristics obtained. The top quintile (or 20 per cent) of CDs was taken. That is, CDs where 79 per cent or more of the dwellings were in the form of attached housing were included in the factor analysis to build up a socio-economic profile of households in these dwelling forms. Socio-economic variables from the 2001 Census of Population and Housing were attached to the top quintile of CDs (1,318 CDs) and entered into a factor analysis. A number of the original variables were excluded from further analysis if they were highly correlated with other variables in the data set to reduce multi-collinearity. A full list of the final variables used in the factor analysis is shown in Appendix 2.

The factor analysis obtained six factors that explained 70 per cent of the variance within the data set (Table 24). High positive or negative correlations of socio-economic characteristics of the population with these factors help in the definition of housing sub-markets and these are presented in Table 25.

Table 24: The percentage of variance explained by the factors emanating from the factor analysis

Factor	Eigenvalue	Percentage of Variance Explained	Cumulative Percentage of Variance Explained
1	3.558	17.79%	17.79%
2	3.022	15.11%	32.90%
3	2.281	11.41%	44.31%
4	1.827	9.13%	53.44%
5	1.816	9.08%	62.52%
6	1.425	7.12%	69.64%

Table 25: The correlation of socio-economic variables with each of the factors

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6
Semi Detached Dwellings	-	-	-	-	0.9	-
Couples without Children	-0.3	0.7	-	-	-	-
One Parent Families	0.6	-0.3	-	-	-	-
Aged 15-24 years	-	-	-	-0.9	-	-
Aged 35-44 years	-	-	0.8	-	-	-
Age 65 years or more	-	-	-0.8	0.4	-	-
Weekly Household Income under $400	0.5	-0.6	-0.4	-	-	-
Associate Professionals	-0.6	-	-	-	-	-
Tradespersons	0.7	-	-	-	-	0.3
Advanced Clerical	-0.3	0.4	-	-	-	0.4
Intermediate Clerical	-	-0.3	-	-	-	0.7
Labourers and Related Workers	0.8	-	-	-	-	-
Owner-Occupiers	-	0.8	-0.3	-	-	-
Dwelling Being Purchased	-	0.5	0.5	-	0.5	-
Rent from State Housing Authority	-	-0.7	-0.3	0.3	0.3	-
Rent from Other Sources	-		0.5	-0.4	-0.6	-
Persons Separated or Divorced	-	-0.4	-	0.6	-	0.3
Persons Born Overseas	0.6	-	-	-0.3	-0.3	-0.3
Flats in a block under 4 storeys	0.5	-	-	-	-0.5	0.3
Weekly Rent over $400	-0.6	-	-	-	-	-0.5

Further, mapping the fragmentation of each of the sub-markets across Sydney establishes their spatial distribution and associations, and these are shown in Figures 14 to 19.

Figure 14: Location of CDs with high scores on Factor 1
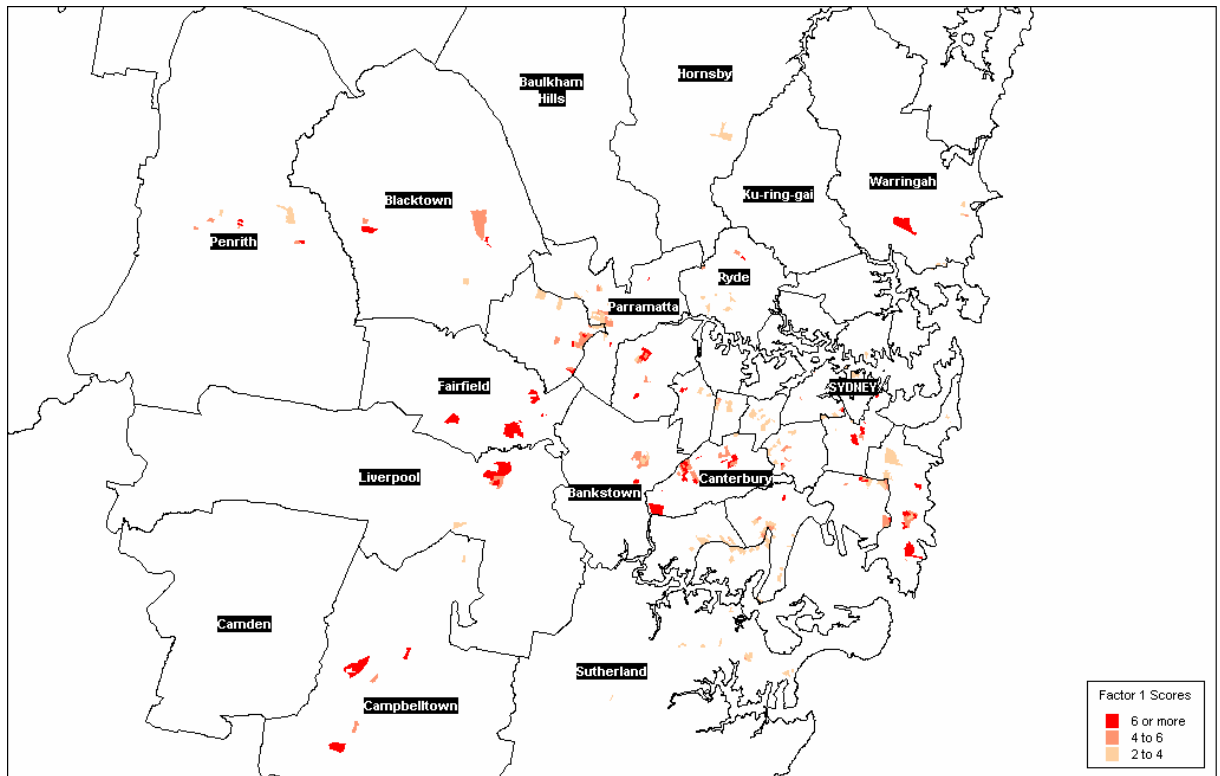
Figure 15: Location of CDs with high scores on Factor 2
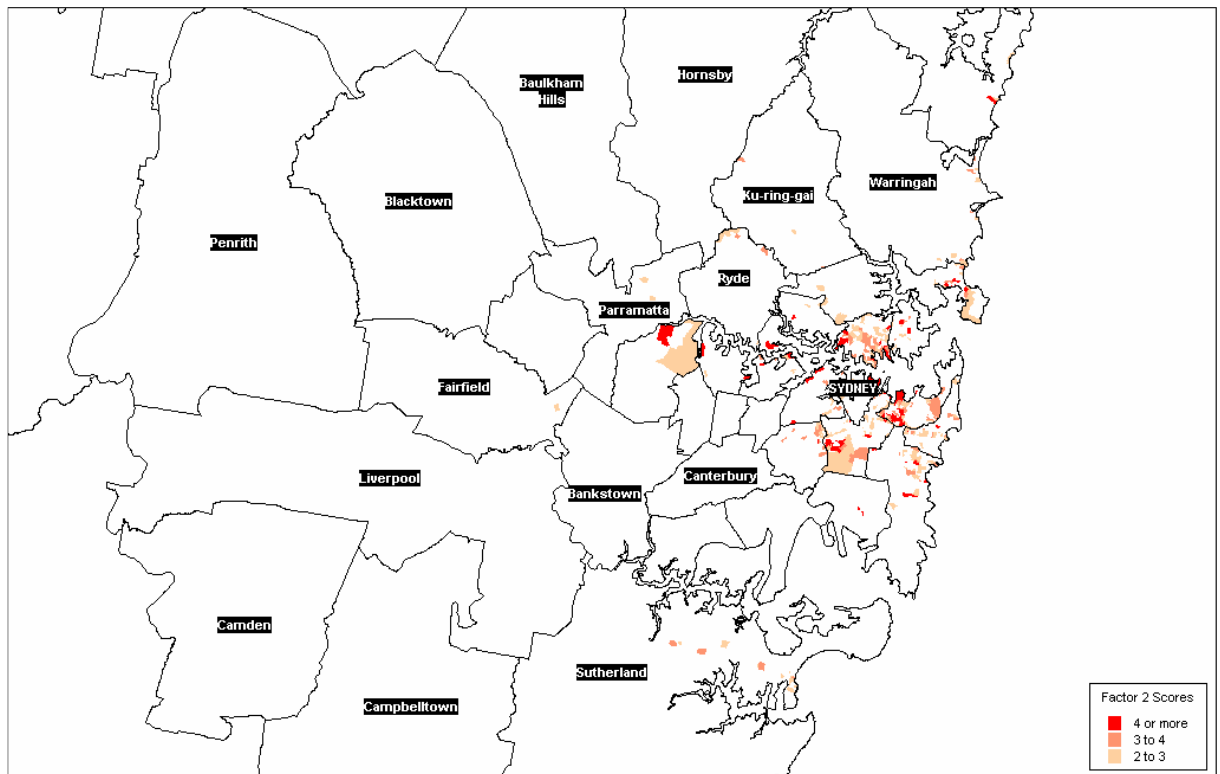
Figure 16: Location of CDs with high scores on Factor 3
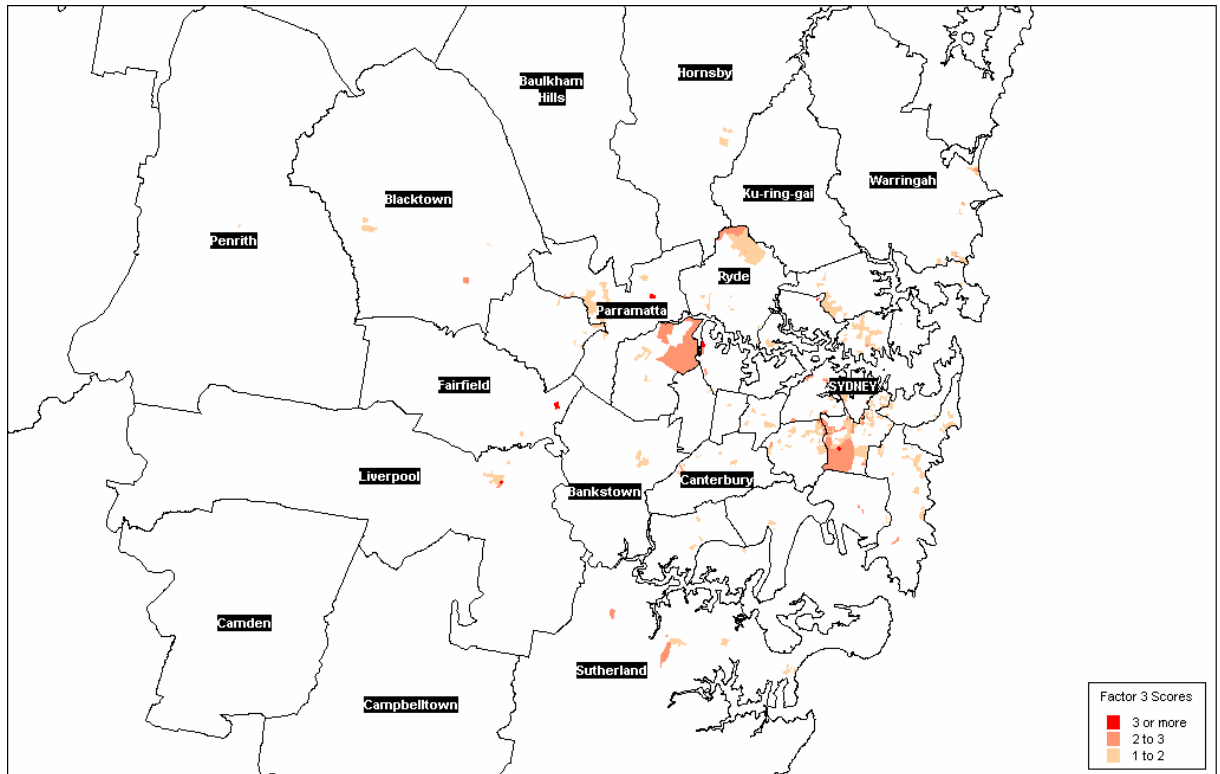
Figure 17: Location of CDs with high scores on Factor 4
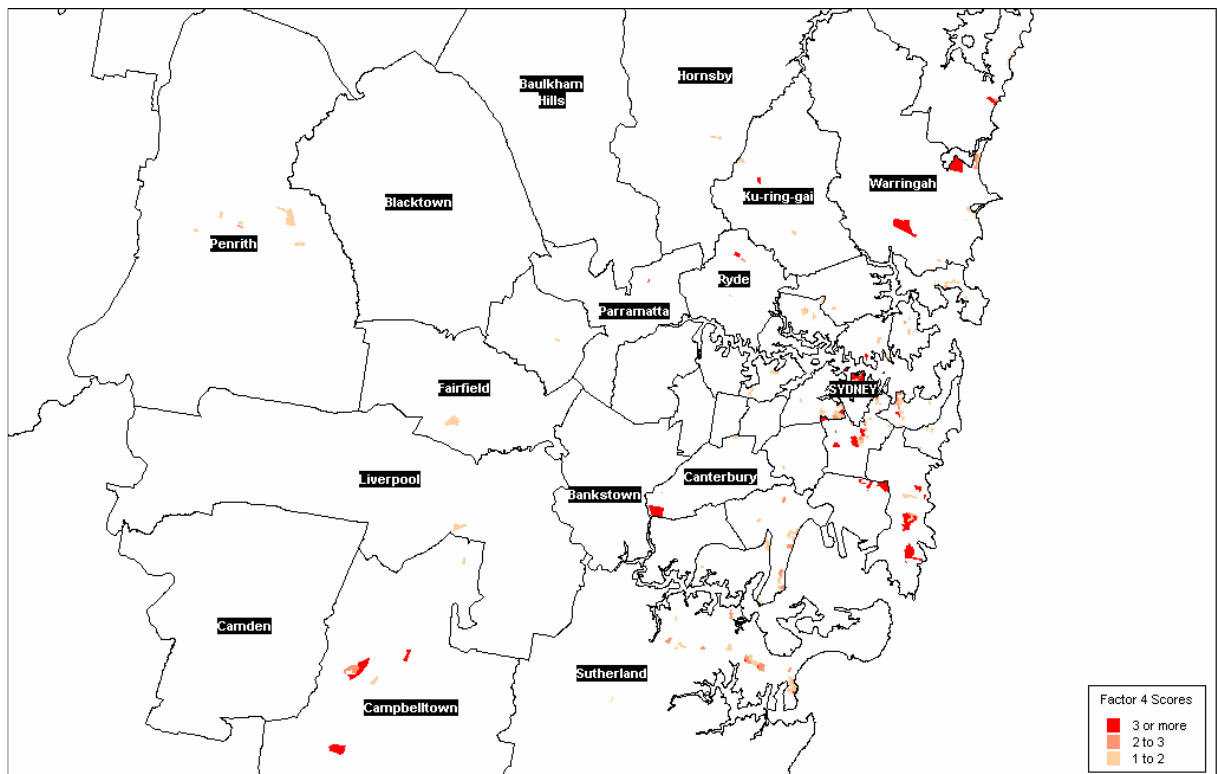
Figure 18: Location of CDs with high scores on Factor 5
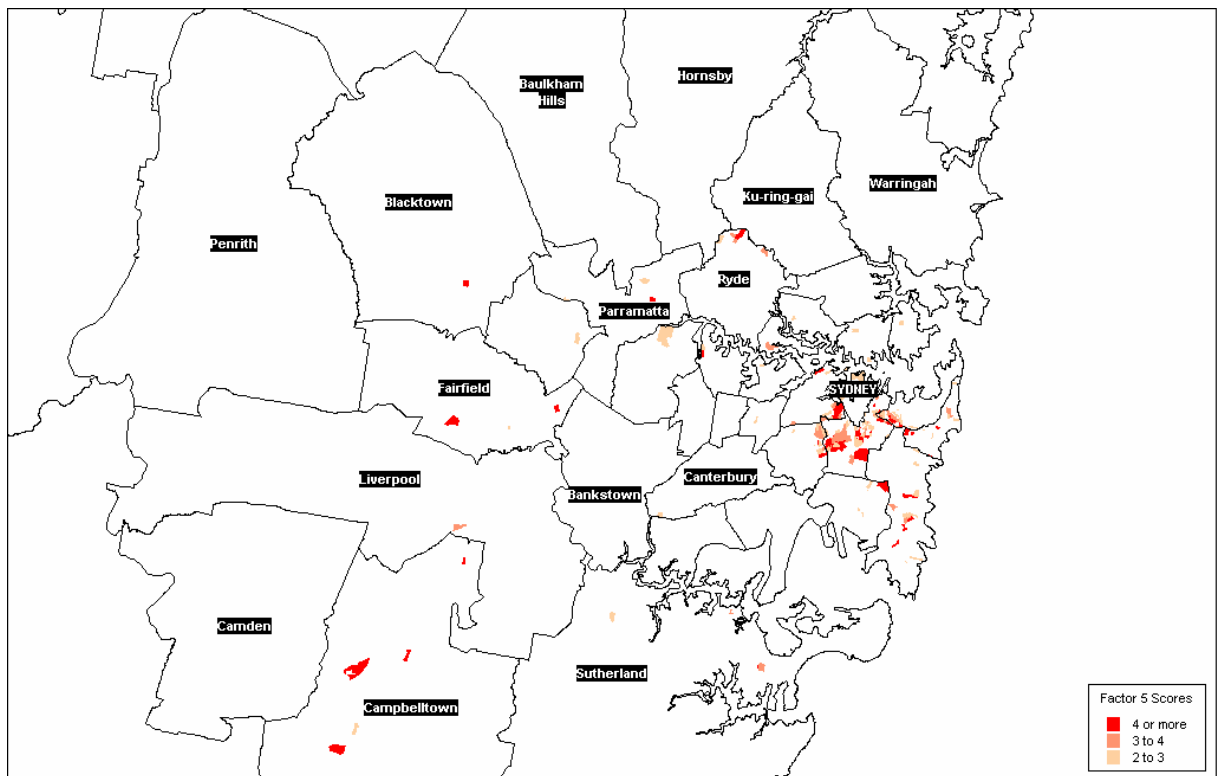
Figure 19: Location of CDs with high scores on Factor 6
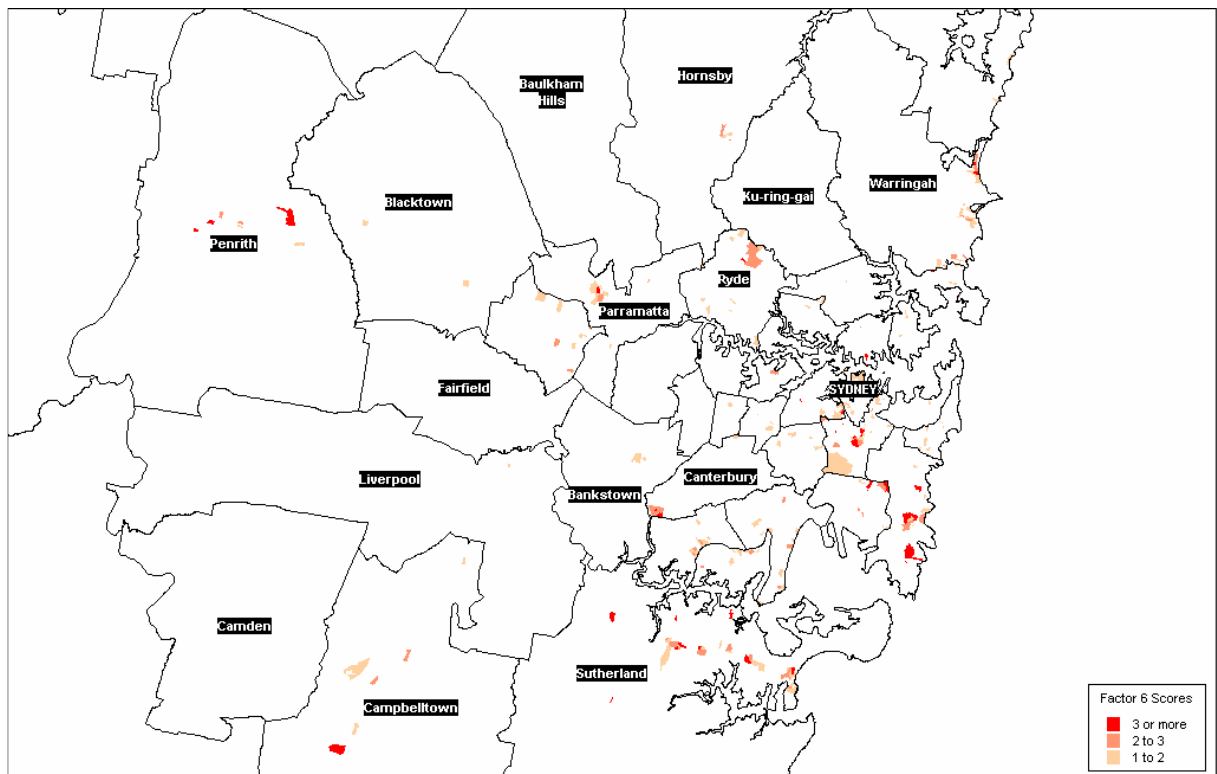
Additional analysis

The factor analysis essentially provides a first cut of the selected data, and identifies the main sub-markets and the locations where they occur in broad terms. In order to more closely describe the social characteristics of the six housing sub-markets identified by the factor scores, special tabulations were obtained from the ABS to provide a social profile by dwelling type for the top 33 or 2.5 per cent of CDs that were most heavily loaded on each factor. These data provided more detail of the characteristics used in the factor analysis. They also represented the population actually living in each of the three main types of attached dwelling. It should be noted that these data refer to the reference person (or 'head') of each household which obviously affects some characteristics of the total population such as age and country of birth.

In this way, a two-step analysis of the social characteristics of each of the housing sub-markets was developed that provides a finer grain to the social profiling exercise. For example the presence of people born overseas is an important feature of the housing sub-market defined by Factor 1 and the more detailed supplementary information shows that only one-fifth of household heads were born in Australia, compared with 26 per cent in South East Asia and 14 per cent in each of the Middle East and South East Europe.

Table 26 presents the summary profiles of these data for those CDs which loaded highest on each factor.

Higher density housing sub-markets in Sydney

The housing sub-markets defined by this two-step process are quite comprehensive. The articulation of housing sub-markets becomes less precise as the degree of explanation offered by each factor drops, and the detailed supplementary information becomes more significant in this regard.

Factor 1: Suburban low income, rental, immigrant sub-market

From Tables 25 and 26, the main variables constructing Factor 1 can be assessed. This factor explained 18 per cent of the variance within the data set. In the 33 CDs with high scores in this factor, the dwelling stock was dominated by low-rise flats (61 per cent), followed by flats in a block of 4 or more storeys (19 per cent) and semi-detached housing (15 per cent). The dominant characteristics of people living in these CDs were:

- only 20 per cent of reference persons were born in Australia, while 26 per cent were born in South East Asia and 14 per cent in each of the Middle East and South Eastern Europe;
- a relatively established resident population: over half of reference persons in attached housing were at the same address as five years earlier, about the same as the total population in all housing in the Sydney Statistical Division;
- about a quarter of the labour force was unemployed and contained a high proportion of tradespersons, labourers and related workers;

- 55 per cent of reference persons were not in the labour force reflecting the high number of single parent families, and possibly the cultural backgrounds of many residents;
- 43 per cent of household incomes were $400 a week or less establishing a strong low-income profile;
- a mature age profile for reference persons with over three-quarters aged over 35;
- a high proportion of single parent families and lone person households counterbalanced by a low percentage of couples with or without children;
- 71 per cent of dwellings were rented, with 46 per cent of households in the dominant dwelling form – low-rise flats – renting from private landlords and 24 per cent from a public authority: 60 per cent of high-rise flats were rented from a public authority and semi-detached dwellings were provided equally by public (28 per cent) and private landlords (30 per cent);
- 36 per cent of the households did not own a car.

These characteristics define a housing sub-market dominated by migrants, mainly from South East Asia, the Middle East and South Eastern Europe who have been established in Australia for some time. There is almost double the Sydney average of single parent families and 50 per cent more lone person households. Conversely there are not many couples either with or without children. Incomes are low, with a high dependence on welfare payments, there is high unemployment and occupational skills are not well developed. About three-quarters of households rent, the majority from private landlords although most high-rise flats are rented from a public authority and there is some public housing present in semi-detached dwellings.

CDs with high scores on Factor 1 are primarily located in suburban Sydney (Canterbury, Bankstown, Liverpool, Fairfield, Holroyd and Auburn), along rail routes through Ashfield and Rockdale as well as in the lower eastern coastal suburbs of Randwick (Figure 14). The social and locational characteristics of this factor, including the dominance of low-rise flats, suggest that this sub-market is strongly associated with the areas of older higher density redevelopment of the 1960s and 1970s.

Factor 2: High amenity inner city sub-market

Factor 2 explained 15 per cent of the variance within the data set. Some 46 per cent of the dwelling stock in the CDs which scored high in this factor was in the form of flats in blocks of 4 storeys or more, 28 per cent as semi-detached dwellings and 17 per cent as low-rise flats. The dominant characteristics of people living in these CDs were:

- very few children, with household type dominated by couples without children or lone person households;
- while a quarter of reference persons were aged over 65, almost half were aged 44 or less, suggesting low rates of parenthood;
- relatively recent residents with only 37 per cent of reference persons living at the same address in 1996;

- high household incomes with over a quarter receiving more than $2,000 a week and another quarter from $1,200 to $1,999;
- less than one-third of households rented, with 42 per cent owning their dwellings outright and another 17 per cent purchasing;
- no public housing;
- nearly half of all households owned one motor vehicle and another quarter two motor vehicles;
- two-thirds of reference persons were born in Australia and another 12 per cent in North West Europe;
- highly educated residents with over 40 per cent of reference persons having Bachelors' or post-graduate qualifications;
- 60 per cent of reference persons were managers, professionals or administrators;
- unemployment was low at 3 per cent in those participating in the workforce.

This housing sub-market is dominated by people with an Anglo-Celtic background, many of mature age and couples without children, but there is also a substantial older population. They are well-off, well-educated, with a higher status occupations profile (74 per cent are employers, administrators or professionals) or are retired. Despite their inner city location, there was also a high incidence of car ownership (77 per cent of households had one or more car).

A high rate of home-ownership (42 per cent own outright and 17 per cent buying) and recent residence suggest a mature market with people looking for convenient locations in which to enjoy a high amenity lifestyle. The distribution of the CDs scoring highly in this factor is strongly associated with areas of recent up-market apartments in configurations of four storeys or more in accessible central and waterfront locations, including developments along the waterfront from Sydney westwards to Olympic Park, high status inner suburbs such as North Sydney and Woollahra, the eastern coastal suburbs, and the new high density Green Square redevelopment in South Sydney (Figure 15).

Factor 3: Generation X rental and home purchase sub-market

Factor 3 explained 11 per cent of the variance within the data set. The CDs scoring highly in this factor had equal amounts of their dwelling stock in semi-detached or high-rise form, at about 37 per cent, with another 22 per cent in blocks of three storeys or less. High-rise housing is therefore less pronounced and semi-detached dwellings more important. The characteristics of the population living in these Districts were:

- over half the households consisted of couples without children or lone person households;
- only 20 per cent lived at the same address in 2001 as in 1996;
- half the reference persons were aged 34 or less and another quarter 35-44;
- incomes were relatively good with over 40 per cent of households receiving more than $1,500 a week (with a high 'not stated' category);
- 28 per cent of reference persons had a Bachelors' degree and 11 per cent postgraduate qualifications;

- 50 per cent worked as mangers, professionals and administrators, with another 15 per cent as associate professionals;
- over half of reference persons were born in Australia, 15 per cent in Europe and 12 per cent in North East Asia, mainly China;
- unemployment was low with only 4 per cent of the labour force so classified in 2001;
- about half the households were in rented accommodation, almost entirely from private landlords: 60 per cent of high-rise flats were so tenanted and 56 per cent of low-rise blocks of flats;
- 40 per cent of dwellings were owned or being purchased: this proportion was highest in semi-detached dwellings and the few separate houses;
- car-ownership was high with only 14 per cent of households not owning a motor vehicle, over half having one and over a quarter, two or more.

This housing sub-market appears to be a variant of that depicted in Factor 2, but much more associated with people at a younger stage in their life cycle. It shows a younger population - two in five are aged 25 to 34 year - of DINKS (double income households with no kids) and SINKS (single income households with no kids), with wider ethnic and cultural characteristics and more mobility (only 20 per cent were resident five years earlier). Half the households in these CDs rent from a private landlord and a quarter are home buyers. Locations of the housing sub-markets scoring highly on this factor are not dissimilar to that of factor 2, but factor 3 includes a wider scatter of areas in the lower cost middle suburbs such as around Parramatta as shown in Figure 16.

Factor 4: Higher density public housing sub-market

Factor 4 explained 9 per cent of the variance. Over half the dwelling stock was in the form of high-rise blocks and another 40 per cent in blocks of three storeys or less. The characteristics of people living in CDs scoring highly in this factor were:

- 42 per cent of reference persons were aged 65 or over;
- 54 per cent of households consisted of one person, 17 per cent single parent families and 7 per cent as couples with children;
- about 80 per cent of households rented from a public authority, 10 per cent of dwellings were fully owned and only 7 per cent being purchased;
- two-thirds of reference persons were at the same address in 2001 as in 1996;
- household incomes were low with nearly two-thirds of them receiving less than $400 a week;
- because of the elderly age profile and high proportion of single parent families, 71 per cent of reference persons were not in the labour force: of those who were, 22 per cent were unemployed;
- about half of reference persons were born in Australia and just over another quarter in Europe;
- only 8 per cent of reference persons had a Bachelors' degree or post-graduate qualification;
- about half the labour force was in the occupations of labourers or clerical, sales and service workers;
- half of households did not have a motor vehicle;

Households in this higher density segment are located in concentrations of older public housing and are associated with a housing sub-market of older working class character, mainly Australian in origin or from earlier post-war waves of immigration from southern Europe. There are significant proportions of single adults – the factor loadings indicated a high association with separated or divorced persons – and single-parent families, reflecting the role of public housing as a welfare sector. However, the population is generally stable, largely retired (42 per cent aged 65 or over), and of very low income. Geographically this factor is widely spread, as Figure 17 shows but is closely associated with areas of higher density public housing, particularly in central and eastern Sydney.

Factor 5: The semi-detached sub-market

Factor 5 explained 9 per cent of the variance within the data set. Here, the defining feature was the dwelling stock, with 84 per cent in the form of semi-detached dwellings. It was not surprising then, that this sub-market was mixed socially, and could be further subdivided into a higher income component and a lower one, with correspondingly distinctive locations. The characteristics of the population living in CDs scoring highly on this factor were mixed:

- over half the households were at the same address in 2001 as five years earlier: about the same as the Sydney average for those living in attached dwellings;
- about a third of households lived in public housing, while another 20 per cent rented from private landlords: 22 per cent of dwellings were owned outright by occupiers and 16 per cent were being purchased;
- reference persons were of young/mature age with about half in the age-range 25-44;
- there were roughly equal proportions of couples with children, couples without children, single parent families and lone person households at about 20 per cent each;
- over two-thirds of reference persons were of Anglo-Celtic origin with about 10 per cent from Asia;
- household incomes were concentrated in the lower range (about a quarter less than $400 a week) and higher range (about a quarter receiving more than $1,500 a week) with a high 'not stated' category;
- 44 per cent of workers were occupied as managers, professionals and administrators, another 15 per cent as associate professionals and the remainder in less skilled occupations;
- almost a quarter of reference persons had Bachelors' degrees or higher qualification;

The predominant semi-detached form was owned or being purchased by 40 per cent of the households living in them, while 30 per cent was public housing and only 21 per cent rented from private landlords. There were two clear geographical components to this factor as can be seen from Figure 18: an outer suburban one associated with 1970s public housing and an inner city market associated with late Victorian terraced houses such as in Paddington to the east of the city centre. This locational split explains the polarised nature of the social profile of this factor, incorporating both gentrified inner city areas and residualised public housing in fringe estates.

Factor 6: Medium density public rental sub-market

Factor 6 explained 7 per cent of the variance within the data set. Some 60 per cent of the dwelling stock was in the form of low-rise flats, 19 per cent as high-rise flats and 18 per cent in semi-detached configuration. The characteristics of people living in CDs with high scores in this factor were:

- 57 per cent were at the same address in 2001 as five years earlier;
- two-thirds were of Anglo-Celtic origin with another 12 per cent of reference persons born in South East Europe;
- 61 per cent of households rented from the public housing authority, including 80 per cent of those living in high-rise flats, with another 15 per cent paying rent to private landlords;
- there was a high proportion of reference persons who were not in the workforce (58 per cent), and of those who were, 13 per cent were unemployed;
- most reference persons were evenly represented in the young to middle-age range, with 28 per cent over 65;
- the main household types were lone person households (44 per cent) and single parent families (20 per cent): another quarter were couples, evenly divided between those with, and those without children;
- household incomes were relatively low, nearly half being in receipt of less than $400 a week;
- over half the occupations of the labour force were in low or semi-skilled occupations in the elementary or intermediate skills categories;
- about 40 per cent of households did not own a motor vehicle.

These population characteristics and the locations shown in Figure 19 indicate a relatively stable sub-market for people on low or moderate incomes, intermediate skill occupations and many in single-parent families or lone-person households. There is a very high proportion of public housing (61 per cent), but this housing sub-market is differentiated from that delineated by Factor 4 by the dominant dwelling form, and differences in the demographic profile of the population.

Summary

The factor analysis and the associated social profile data for CDs scoring highly on each of the factors strongly supports the conclusion that a number of distinctive sub-markets can be identified in the higher density housing stock in Sydney with distinguishing locational characteristics. These sub-markets are differentiated by dwelling form (medium or high rise), as well as tenure (two clusters are predominantly public housing, for example). At least one is clearly a market associated with higher income life-style aspirants in the newer high rise sector, while the cluster which accounts for the greatest explanation of variation in the dataset is closely associated with disadvantaged migrant populations living in lower cost rental accommodation in middle suburban locations. Table 26 shows the distinguishing and detailed characteristics of CD clusters with high scores on each of the factors 1 to 6.

Table 26: Characteristics of CD clusters with high scores on Factors 1 to 6

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6
Household type						
Couple family with children	24%	16%	18%	7%	22%	11%
Couple without children	14%	33%	28%	12%	19%	13%
Single Parent family	19%	6%	7%	17%	18%	20%
Lone Person Household	33%	29%	26%	54%	24%	44%
Group Household	3%	7%	12%	3%	8%	3%
Other/Not Stated	8%	9%	10%	7%	9%	8%
Total	100%	100%	100%	100%	100%	100%
Household Income						
$0-$199	15%	3%	3%	24%	8%	17%
$200-$399	28%	7%	5%	34%	16%	27%
$400-$599	15%	6%	6%	11%	9%	12%
$600-$799	10%	6%	8%	5%	7%	8%
$800-$999	6%	6%	8%	3%	6%	5%
$1,000-$1,199	4%	8%	12%	2%	7%	4%
$1,200-$1,499	3%	4%	7%	1%	5%	3%
$1,500-$1,999	2%	19%	19%	2%	11%	4%
$2,000 or more	1%	25%	19%	1%	13%	2%
Not Stated	16%	16%	13%	18%	18%	18%
Total	100%	100%	100%	100%	100%	100%
Tenure						
Fully Owned	13%	42%	15%	5%	22%	8%
Being Purchased	7%	17%	26%	2%	16%	6%
Rented - State/Territory Housing Authority	32%	0%	0%	78%	31%	61%
Rented - Other landlord	38%	31%	49%	4%	20%	14%
Rented - Landlord Not stated	1%	0%	0%	1%	0%	1%
Rented - Total	71%	31%	50%	83%	52%	76%
Other tenure type	2%	2%	1%	2%	2%	2%
Not Stated	7%	7%	7%	8%	8%	8%
Total	100%	100%	100%	100%	100%	100%
Number of Motor Vehicles						
None	36%	13%	14%	51%	23%	38%
1 motor vehicle	41%	46%	52%	24%	44%	34%
2 motor vehicles	7%	26%	23%	3%	17%	8%
3 motor vehicles	1%	4%	2%	1%	3%	1%
4 or more motor vehicles	1%	1%	1%	1%	1%	1%
Not stated	14%	9%	9%	20%	13%	17%

Total	100%	100%	100%	100%	100%	100%
Address Five Years Earlier						
Same as in 2001	49%	37%	20%	64%	51%	57%
Elsewhere in 1996	47%	61%	79%	31%	46%	40%
Not stated	4%	1%	2%	5%	3%	3%
Total	100%	100%	100%	100%	100%	100%
Birthplace						
Australia	20%	64%	52%	47%	58%	55%
Other Oceania	4%	4%	5%	3%	7%	4%
North West Europe	4%	12%	10%	8%	10%	9%
South Eastern Europe	14%	5%	5%	18%	6%	12%
North Africa	1%	0%	1%	1%	0%	1%
Middle East	14%	1%	2%	4%	2%	4%
South East Asia	26%	2%	6%	4%	5%	4%
North East Asia	6%	5%	12%	3%	5%	2%
South and Central Asia	2%	1%	3%	1%	1%	1%
Northern America	0%	2%	1%	0%	1%	0%
South and Central America	4%	1%	1%	2%	2%	2%
Caribbean	0%	0%	0%	0%	0%	0%
Sub-Saharan Africa	1%	2%	2%	1%	1%	1%
Not Stated	4%	2%	11%	6%	3%	4%
Total	100%	100%	100%	100%	100%	100%
Occupation						
Managers and Administrators	2%	24%	15%	5%	12%	6%
Professionals	7%	35%	34%	15%	32%	15%
Associate Professionals	5%	15%	15%	8%	13%	11%
Tradespersons and Related Workers	17%	4%	6%	7%	7%	11%
Advanced Clerical and Service Workers	1%	4%	4%	3%	4%	4%
Intermediate Clerical, Sales and Service Workers	13%	9%	14%	23%	14%	25%
Intermediate Production and Transport Workers	18%	1%	4%	8%	6%	8%
Elementary Clerical, Sales and Service Workers	10%	3%	4%	13%	6%	9%
Labourers and Related Workers	23%	1%	3%	13%	4%	9%
Inadequately described	1%	2%	1%	1%	1%	1%
Not stated	2%	1%	0%	4%	1%	1%
Total	100%	100%	100%	100%	100%	100%

Age						
15-24	4%	4%	11%	3%	6%	5%
25-34	18%	21%	39%	9%	23%	15%
35-44	23%	18%	25%	13%	24%	18%
45-54	18%	18%	14%	17%	19%	19%
55-64	13%	14%	6%	17%	12%	15%
65 and over	22%	24%	4%	42%	17%	28%
Total	100%	100%	100%	100%	100%	100%
Post-School Qualification						
Postgraduate Degree Level	1%	10%	8%	1%	5%	1%
Graduate Diploma and Graduate Certificate Level	0%	3%	3%	1%	2%	1%
Bachelor Degree Level	5%	27%	28%	6%	16%	6%
Advanced Diploma and Diploma Level	4%	10%	11%	5%	7%	6%
Certificate Level	10%	11%	13%	10%	12%	13%
Not Stated	79%	8%	37%	77%	58%	73%
Total	100%	100%	100%	100%	100%	100%
Labour Force Status						
Employed	76%	97%	96%	78%	91%	87%
Unemployed	24%	3%	4%	22%	9%	13%
Labour Force	100%	100%	100%	100%	100%	100%
Not in the labour force	55%	28%	14%	71%	39%	58%
Not stated	4%	1%	1%	6%	2%	4%
Total	100%	100%	100%	100%	100%	100%

(source: ABS Special Tabulations from the 2001 Census)

6. CONCLUSION

The research presented in this Research Paper clearly indicates that distinctive groups of the population of Sydney are living in different types of attached housing at particular locations. Up to now urban consolidation policies in Sydney have been dominated by considerations of accessibility and availability of public transport, so that areas for medium- and high-density housing have been zoned around transport hubs and corridors. The market has then taken up those opportunities in varying degree and style.

Given the dominant role now given to urban consolidation and the building of attached dwellings to house the future population of Sydney, there is a need and growing capability to more adequately satisfy housing needs and ensure optimal social outcomes (Bunker, Holloway & Randolph 2005c, Randolph 2002, Randolph & Holloway 2005a, 2005b).

This Research Paper has set a foundation and directions for further research, and shows that particular research is needed into:

- migration trends and characteristics - where do residents in attached housing sub-markets come from and what are their distinguishing features?

- how far is affordability a criterion for choosing to live in attached housing?

- how should areas for attached housing be selected and zoned in terms of social composition, dwelling type, size and location?

- in what ways does attached housing satisfy residents, what are its deficiencies, and in what manner does it satisfy expectations or disappoint them?

Addressing these questions would lead to more sensitive and differentiated urban consolidation policies and more effectively connect metropolitan planning with local housing needs and social circumstances.

There will be a companion Issues Paper *Social and Housing Issues Arising From Increased Urban Consolidation in Sydney as Proposed in the new Metropolitan Strategy* dealing with some of the policy implications and challenges of this research when the metropolitan strategy is released.

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APPENDIX 1: ANALYTICAL TABLES

Table 1: Separate houses and 'Other Residential' Dwellings in Sydney Statistical Division 1971-2001

	Separate Houses	% of total dwellings	% increase	Other Residential	% of total dwellings	% increase	Total Dwellings	%
1971	561,899	66.2	-	280,188	33.0	-	849,369	100.0
1976	707,088	66.5	25.8	318,516	30.0	13.7	1,063,086	100.0
1981	765,449	66.7	8.3	344,717	30.0	8.2	1,147,650	100.0
1986	822,839	66.9	7.5	366,846	29.8	6.4	1,230,399	100.0
1991	874,040	66.5	6.2	410,861	31.3	12.0	1,314,294	100.0
1996	904,931	64.0	3.5	458,323	32.4	11.6	1,413,953	100.0
2001	960,997	62.1	6.2	556,705	36.0	21.5	1,546,691	100.0

(source: ABS, Various Censuses)

Table 2: The number and proportion of different dwelling types in Sydney, 1991-2001

	1991	Percentage of Occupied Private Dwellings	2001	Percentage of Occupied Private Dwellings	Absolute Change 1991-2001	Percentage Change 1991-2001	Percentage Point Change 1991-2001
Separate houses	823,721	67.5%	907,195	63.1%	83,474	10.1%	-4.5%
Semi detached dwellings	106,697	8.7%	162,320	11.3%	55,623	52.1%	2.5%
Flat in a block of less than 4 storeys	174,634	14.3%	217,317	15.1%	42,683	24.4%	0.8%
Flat in a block of 4 or more storeys	82,839	6.8%	120,452	8.4%	37,613	45.4%	1.6%
Flat attached to a house	6,347	0.5%	5,749	0.4%	-598	-9.4%	-0.1%
Other dwellings	14,066	1.2%	11,896	0.8%	-2,170	-15.4%	-0.3%
Dwelling structure not stated	11,378	0.9%	13,465	0.9%	2,087	18.3%	0.0%
Total Occupied Private Dwellings	1,219,682	100.0%	1,438,394	100.0%	218,712	17.9%	
Unoccupied Dwellings	94,612		108,297				
Total Dwellings	1,314,294		1,546,691				

(source: ABS CDATA91 and CDATA2001)

Table 3: Dwelling structure by number of bedrooms, Sydney, 1991-2001

	Separate Houses	Semi Detached Dwellings	Flat in block under 4 storeys	Flat in block with 4 or more storeys	Flat attached to house	Other Dwellings	Not Stated	Total
1991								
0-1 bedrooms	10,803	10,500	39,324	19,144	3,306	4,888	1,081	89,046
2 bedrooms	132,601	43,804	106,791	49,468	1,680	5,234	3,177	342,755
3 or more bedrooms	658,664	47,135	17,151	8,725	1,001	2,689	5,289	740,654
Not Stated	21,649	5,275	11,376	5,494	430	1,300	1,739	47,263
Total	823,717	106,714	174,642	82,831	6,417	14,111	11,286	1,219,718
2001								
0-1 bedrooms	9,255	10,508	44,447	27,449	2,719	3,420	2,469	100,267
2 bedrooms	98,965	52,877	128,877	63,347	1,518	4,284	3,811	353,679
3 or more bedrooms	770,934	90,507	24,894	15,148	1,018	2,357	4,859	909,717
Not Stated	28,041	8,429	19,098	14,506	501	1,844	2,307	74,726
Total	907,195	162,321	217,316	120,450	5,756	11,905	13,446	1,438,389
Absolute Change 1991-2001								
0-1 bedrooms	-1,548	8	5,123	8,305	-587	-1,468	1,388	11,221
2 bedrooms	-33,636	9,073	22,086	13,879	-162	-950	634	10,924
3 or more bedrooms	112,270	43,372	7,743	6,423	17	-332	-430	169,063
Not Stated	6,392	3,154	7,722	9,012	71	544	568	27,463
Total	83,478	55,607	42,674	37,619	-661	-2,206	2,160	218,671
Percentage Change 1991-2001								
0-1 bedrooms	-14.3%	0.1%	13.0%	43.4%	-17.8%	-30.0%	128.4%	12.6%
2 bedrooms	-25.4%	20.7%	20.7%	28.1%	-9.6%	-18.2%	20.0%	3.2%
3 or more bedrooms	17.0%	92.0%	45.1%	73.6%	1.7%	-12.3%	-8.1%	22.8%
Not Stated	29.5%	59.8%	67.9%	164.0%	16.5%	41.8%	32.7%	58.1%
Total	10.1%	52.1%	24.4%	45.4%	-10.3%	-15.6%	19.1%	17.9%

(source: ABS Special Request Matrix, Census of Population and Housing, 1991 and 2001)

Table 4: Dwelling structure by number of bedrooms, Sydney, 1991-2001 (%)

	Separate Houses	Semi Detached Dwellings	Flat in block under 4 storeys	Flat in block with 4 or more storeys	Flat attached to house	Other Dwellings	Not Stated	Total
1991								
0-1 bedrooms	1.3%	9.8%	22.5%	23.1%	51.5%	34.6%	9.6%	7.3%
2 bedrooms	16.1%	41.0%	61.1%	59.7%	26.2%	37.1%	28.1%	28.1%
3 or more bedrooms	80.0%	44.2%	9.8%	10.5%	15.6%	19.1%	46.9%	60.7%
Not Stated	2.6%	4.9%	6.5%	6.6%	6.7%	9.2%	15.4%	3.9%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
2001								
0-1 bedrooms	1.0%	6.5%	20.5%	22.8%	47.2%	28.7%	18.4%	7.0%
2 bedrooms	10.9%	32.6%	59.3%	52.6%	26.4%	36.0%	28.3%	24.6%
3 or more bedrooms	85.0%	55.8%	11.5%	12.6%	17.7%	19.8%	36.1%	63.2%
Not Stated	3.1%	5.2%	8.8%	12.0%	8.7%	15.5%	17.2%	5.2%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Percentage Point Change 1991-2001								
0-1 bedrooms	-0.3%	-3.4%	-2.1%	-0.3%	-4.3%	-5.9%	8.8%	-0.3%
2 bedrooms	-5.2%	-8.5%	-1.8%	-7.1%	0.2%	-1.1%	0.2%	-3.5%
3 or more bedrooms	5.0%	11.6%	1.6%	2.0%	2.1%	0.7%	-10.7%	2.5%
Not Stated	0.5%	0.2%	2.3%	5.4%	2.0%	6.3%	1.7%	1.3%
Total	-	-	-	-	-	-	-	-

(source: ABS Special Request Matrix, Census of Population and Housing, 1991 and 2001)

Table 5: Dwelling structure by number of bedrooms, Sydney, 1991-2001 (%)

	Separate Houses	Semi Detached Dwellings	Flat in block under 4 storeys	Flat in block with 4 or more storeys	Flat attached to house	Other Dwellings	Not Stated	Total
1991								
0-1 bedrooms	12.1%	11.8%	44.2%	21.5%	3.7%	5.5%	1.2%	100.0%
2 bedrooms	38.7%	12.8%	31.2%	14.4%	0.5%	1.5%	0.9%	100.0%
3 or more bedrooms	88.9%	6.4%	2.3%	1.2%	0.1%	0.4%	0.7%	100.0%
Not Stated	45.8%	11.2%	24.1%	11.6%	0.9%	2.8%	3.7%	100.0%
Total	67.5%	8.7%	14.3%	6.8%	0.5%	1.2%	0.9%	100.0%
2001								
0-1 bedrooms	9.2%	10.5%	44.3%	27.4%	2.7%	3.4%	2.5%	100.0%
2 bedrooms	28.0%	15.0%	36.4%	17.9%	0.4%	1.2%	1.1%	100.0%
3 or more bedrooms	84.7%	9.9%	2.7%	1.7%	0.1%	0.3%	0.5%	100.0%
Not Stated	37.5%	11.3%	25.6%	19.4%	0.7%	2.5%	3.1%	100.0%
Total	63.1%	11.3%	15.1%	8.4%	0.4%	0.8%	0.9%	100.0%
Percentage Point Change 1991-2001								
0-1 bedrooms	-2.9%	-1.3%	0.2%	5.9%	-1.0%	-2.1%	1.2%	-
2 bedrooms	-10.7%	2.2%	5.3%	3.5%	-0.1%	-0.3%	0.2%	-
3 or more bedrooms	-4.2%	3.6%	0.4%	0.5%	0.0%	-0.1%	-0.2%	-
Not Stated	-8.3%	0.1%	1.5%	7.8%	-0.2%	-0.3%	-0.6%	-
Total	-4.5%	2.5%	0.8%	1.6%	-0.1%	-0.3%	0.0%	-

(source: ABS Special Request Matrix, Census of Population and Housing, 1991 and 2001)

Table 6: Dwelling structure by tenure, Sydney, 1991

	Separate Houses	Semi Detached Dwellings	Flat in block under 4 storeys	Flat in block with 4 or more storeys	Flat attached to house	Other Dwellings	Not Stated	Total
1991								
Owned	383,283	31,503	30,693	20,571	1,120	4,028	3,268	474,466
Being purchased	268,319	20,701	19,795	9,679	342	1,154	2,444	322,434
Rent State housing Authority	28,665	15,288	18,350	7,246	41	39	593	70,222
Rent from other sources	91,726	30,351	88,580	37,060	3,830	6,580	2,742	260,869
Rent – landlord not stated	4,559	1,235	3,501	1,313	154	367	152	11,281
Total Rented	124,950	46,874	110,431	45,619	4,025	6,986	3,487	342,372
Other/inadequately described/not stated	47,165	7,636	13,723	6,962	930	1,943	2,087	80,446
Total	823,717	106,714	174,642	82,831	6,417	14,111	11,286	1,219,718

	Separate Houses	Semi Detached Dwellings	Flat in block under 4 storeys	Flat in block with 4 or more storeys	Flat attached to house	Other Dwellings	Not Stated	Total
1991								
Owned	46.5%	29.5%	17.6%	24.8%	17.5%	28.5%	29.0%	38.9%
Being purchased	32.6%	19.4%	11.3%	11.7%	5.3%	8.2%	21.7%	26.4%
Rented from Government Authority	3.5%	14.3%	10.5%	8.7%	0.6%	0.3%	5.3%	5.8%
Rent from Other Sources	11.1%	28.4%	50.7%	44.7%	59.7%	46.6%	24.3%	21.4%
Rent – landlord not stated	0.6%	1.2%	2.0%	1.6%	2.4%	2.6%	1.3%	0.9%
Total Rented	15.2%	43.9%	63.2%	55.1%	62.7%	49.5%	30.9%	28.1%
Other/inadequately described/not stated	5.7%	7.2%	7.9%	8.4%	14.5%	13.8%	18.5%	6.6%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

	Separate Houses	Semi Detached Dwellings	Flat in block under 4 storeys	Flat in block with 4 or more storeys	Flat attached to house	Other Dwellings	Not Stated	Total
1991								
Owned	80.8%	6.6%	6.5%	4.3%	0.2%	0.8%	0.7%	100.0%
Being purchased	83.2%	6.4%	6.1%	3.0%	0.1%	0.4%	0.8%	100.0%
Rented from Government Authority	40.8%	21.8%	26.1%	10.3%	0.1%	0.1%	0.8%	100.0%
Rent from Other Sources	35.2%	11.6%	34.0%	14.2%	1.5%	2.5%	1.1%	100.0%
Rent – landlord not stated	40.4%	10.9%	31.0%	11.6%	1.4%	3.3%	1.3%	100.0%
Total Rented	36.5%	13.7%	32.3%	13.3%	1.2%	2.0%	1.0%	100.0%
Other/inadequately described/not stated	58.6%	9.5%	17.1%	8.7%	1.2%	2.4%	2.6%	100.0%
Total	67.5%	8.7%	14.3%	6.8%	0.5%	1.2%	0.9%	100.0%

(source: ABS Special Request Matrix, Census of Population and Housing, 1991)

Table 7: Dwelling structure by tenure, Sydney, 2001

	Separate Houses	Semi Detached Dwellings	Flat in block under 4 storeys	Flat in block with 4 or more storeys	Other Dwellings	Not Stated	Total
2001							
Owned	440,743	48,708	39,089	24,198	4,223	4,275	561,238
Being purchased	268,703	32,259	23,362	13,438	901	1,865	340,527
Rent State housing Authority	26,231	17,666	21,331	7,059	61	392	72,739
Rent from other sources	114,696	49,207	105,585	57,579	8,725	3,138	338,927
Rent – landlord not stated	1,623	735	1,502	679	153	87	4,779
Total Rented	142,550	67,608	128,418	65,317	8,938	3,618	416,445
Other tenure type	18,183	4,334	6,549	2,540	1,258	1,270	34,136
Not stated	37,016	9,412	19,898	14,957	2,340	2,418	86,044
Total	907,195	162,321	217,316	120,450	17,661	13,446	1,438,389
2001 (%)							
Owned	48.6%	30.0%	18.0%	20.1%	23.9%	31.8%	39.0%
Being purchased	29.6%	19.9%	10.8%	11.2%	5.1%	13.9%	23.7%
Rent State housing Authority	2.9%	10.9%	9.8%	5.9%	0.3%	2.9%	5.1%
Rent from other sources	12.6%	30.3%	48.6%	47.8%	49.4%	23.3%	23.6%
Rent – landlord not stated	0.2%	0.5%	0.7%	0.6%	0.9%	0.6%	0.3%
Total Rented	15.7%	41.7%	59.1%	54.2%	50.6%	26.9%	29.0%
Other tenure type	2.0%	2.7%	3.0%	2.1%	7.1%	9.4%	2.4%
Not stated	4.1%	5.8%	9.2%	12.4%	13.2%	18.0%	6.0%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
	Separate	Semi Detached	Flat in	Flat in block	Other	Not Stated	Total

	Houses	Dwellings	block under 4 storeys	with 4 or more storeys	Dwellings		
2001 (%)							
Owned	78.5%	8.7%	7.0%	4.3%	0.8%	0.8%	100.0%
Being purchased	78.9%	9.5%	6.9%	3.9%	0.3%	0.5%	100.0%
Rent State housing Authority	36.1%	24.3%	29.3%	9.7%	0.1%	0.5%	100.0%
Rent from other sources	33.8%	14.5%	31.2%	17.0%	2.6%	0.9%	100.0%
Rent – landlord not stated	34.0%	15.4%	31.4%	14.2%	3.2%	1.8%	100.0%
Total Rented	34.2%	16.2%	30.8%	15.7%	2.1%	0.9%	100.0%
Other tenure type	53.3%	12.7%	19.2%	7.4%	3.7%	3.7%	100.0%
Not stated	43.0%	10.9%	23.1%	17.4%	2.7%	2.8%	100.0%
Total	63.1%	11.3%	15.1%	8.4%	1.2%	0.9%	100.0%

(source: ABS Special Request Matrix, Census of Population and Housing, 2001)

Table 8: Dwelling structure by tenure, Sydney, 2001

	Separate Houses	Semi Detached Dwellings	Flat in block under 4 storeys	Flat in block with 4 or more storeys
Absolute Change 1991-2001				
Owned	57,460	17,205	8,396	3,627
Being purchased	384	11,558	3,567	3,759
Rent State housing Authority	-2,434	2,378	2,981	-187
Rent from other sources	22,970	18,856	17,005	20,519
Rent – landlord not stated	-2,936	-500	-1,999	-634
Percentage Change 1991-2001				
Owned	15.0%	54.6%	27.4%	17.6%
Being purchased	0.1%	55.8%	18.0%	38.8%
Rent State housing Authority	-8.5%	15.6%	16.2%	-2.6%
Rent from other sources	25.0%	62.1%	19.2%	55.4%
Rent – landlord not stated	-64.4%	-40.5%	-57.1%	-48.3%

Percentage Point Change - Rows	Separate Houses	Semi Detached Dwellings	Flat in block under 4 storeys	Flat in block with 4 or more storeys	Total
Owned	-2.3%	2.0%	0.5%	0.0%	NA
Being purchased	-4.3%	3.1%	0.7%	0.9%	NA
Rent State housing Authority	-4.8%	2.5%	3.2%	-0.6%	NA
Rent from other sources	-1.3%	2.9%	-2.8%	2.8%	NA
Rent – landlord not stated	-6.5%	4.4%	0.4%	2.6%	NA
Total	4.4%	1.8%	-2.0%	-0.3%	NA
Percentage Point Change - Columns					
Owned	2.1%	0.5%	0.4%	-4.7%	0.1%
Being purchased	-3.0%	0.5%	-0.6%	-0.5%	-2.8%
Rent State housing Authority	-0.6%	-3.4%	-0.7%	-2.9%	-0.7%
Rent from other sources	1.5%	1.9%	-2.1%	3.1%	2.2%
Rent – landlord not stated	-0.4%	-0.7%	-1.3%	-1.0%	-0.6%
Total	NA	NA	NA	NA	NA

Table 9: Dwelling structure by household type, Sydney, 1991-2001

	Separate Houses	Semi Detached Dwellings	Flat in block under 4 storeys	Flat in block with 4 or more storeys	Flat attached to house	Other Dwellings	Not Stated	Total
1991								
Lone person households	99,487	28,332	65,612	33,468	2,910	483	2,618	237,258
Group households	24,066	10,813	17,827	8,690	407	102	799	63,626
1/2/3 family households	686,999	64,046	83,519	36,563	2,868	759	6,562	888,153
Other	13,165	3,523	7,684	4,110	232	66	1,307	30,681
Total	823,717	106,714	174,642	82,831	6,417	1,411	11,286	1,219,718
2001								
Lone person households	121,922	43,637	84,415	43,486	2,708	4,846	4,660	305,672
Group households	20,163	10,393	16,526	10,555	244	798	560	59,239
1/2/3 family households	739,852	100,360	98,112	50,024	2,330	4,652	6,111	1,001,442
Other	25,258	7,931	18,264	16,385	474	1,608	2,114	72,036
Total	907,195	162,321	217,316	120,450	5,756	11,905	13,446	1,438,389
Absolute Change 1991-2001								
Lone person households	22,435	15,305	18,803	10,017	-202	4,363	2,042	68,414
Group households	-3,903	-420	-1,301	1,865	-164	696	-239	-4,387
1/2/3 family households	52,853	36,314	14,593	13,461	-538	3,893	-450	113,289
Other	12,093	4,408	10,580	12,276	243	1,542	807	41,355
Total	83,478	55,607	42,674	37,619	-661	10,494	2,160	218,671
Percentage Change 1991-2001								
Lone person households	22.6%	54.0%	28.7%	29.9%	-6.9%	902.5%	78.0%	28.8%
Group households	-16.2%	-3.9%	-7.3%	21.5%	-40.2%	680.0%	-29.9%	-6.9%
1/2/3 family households	7.7%	56.7%	17.5%	36.8%	-18.8%	512.7%	-6.9%	12.8%
Other	91.9%	125.1%	137.7%	298.7%	104.7%	2340.6%	61.7%	134.8%
Total	10.1%	52.1%	24.4%	45.4%	-10.3%	743.7%	19.1%	17.9%

(source: ABS Special Request Matrix, Census of Population and Housing, 1991 and 2001)

Table 10: Dwelling structure by household type, Sydney, 1991-2001 (%)

	Separate Houses	Semi Detached Dwellings	Flat in block under 4 storeys	Flat in block with 4 or more storeys	Flat attached to house	Other Dwellings	Not Stated	Total
1991								
Lone person households	12.1%	26.5%	37.6%	40.4%	45.3%	34.3%	23.2%	19.5%
Group households	2.9%	10.1%	10.2%	10.5%	6.3%	7.3%	7.1%	5.2%
1/2/3 family households	83.4%	60.0%	47.8%	44.1%	44.7%	53.8%	58.1%	72.8%
Other	1.6%	3.3%	4.4%	5.0%	3.6%	4.7%	11.6%	2.5%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
2001								
Lone person households	13.4%	26.9%	38.8%	36.1%	47.0%	40.7%	34.7%	21.3%
Group households	2.2%	6.4%	7.6%	8.8%	4.2%	6.7%	4.2%	4.1%
1/2/3 family households	81.6%	61.8%	45.1%	41.5%	40.5%	39.1%	45.5%	69.6%
Other	2.8%	4.9%	8.4%	13.6%	8.2%	13.5%	15.7%	5.0%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Percentage Point Change 1991-2001								
Lone person households	1.4%	0.3%	1.3%	-4.3%	1.7%	6.4%	11.5%	1.8%
Group households	-0.7%	-3.7%	-2.6%	-1.7%	-2.1%	-0.5%	-2.9%	-1.1%
1/2/3 family households	-1.8%	1.8%	-2.7%	-2.6%	-4.2%	-14.7%	-12.7%	-3.2%
Other	1.2%	1.6%	4.0%	8.6%	4.6%	8.8%	4.1%	2.5%
Total	-	-	-	-	-	-	-	-

(source: ABS Special Request Matrix, Census of Population and Housing, 1991 and 2001)

Table 11: Dwelling structure by household type, Sydney, 1991-2001 (%)

	Separate Houses	Semi Detached Dwellings	Flat in block under 4 storeys	Flat in block with 4 or more storeys	Flat attached to house	Other Dwellings	Not Stated	Total
1991								
Lone person households	41.9%	11.9%	27.7%	14.1%	1.2%	0.2%	1.1%	100.0%
Group households	37.8%	17.0%	28.0%	13.7%	0.6%	0.2%	1.3%	100.0%
1/2/3 family households	77.4%	7.2%	9.4%	4.1%	0.3%	0.1%	0.7%	100.0%
Other	42.9%	11.5%	25.0%	13.4%	0.8%	0.2%	4.3%	100.0%
Total	67.5%	8.7%	14.3%	6.8%	0.5%	0.1%	0.9%	100.0%
2001								
Lone person households	39.9%	14.3%	27.6%	14.2%	0.9%	1.6%	1.5%	100.0%
Group households	34.0%	17.5%	27.9%	17.8%	0.4%	1.3%	0.9%	100.0%
1/2/3 family households	73.9%	10.0%	9.8%	5.0%	0.2%	0.5%	0.6%	100.0%
Other	35.1%	11.0%	25.4%	22.7%	0.7%	2.2%	2.9%	100.0%
Total	63.1%	11.3%	15.1%	8.4%	0.4%	0.8%	0.9%	100.0%
Percentage Point Change 1991-2001								
Lone person households	-2.0%	2.3%	0.0%	0.1%	-0.3%	1.4%	0.4%	-
Group households	-3.8%	0.5%	-0.1%	4.2%	-0.2%	1.2%	-0.3%	-
1/2/3 family households	-3.5%	2.8%	0.4%	0.9%	-0.1%	0.4%	-0.1%	-
Other	-7.8%	-0.5%	0.3%	9.4%	-0.1%	2.0%	-1.3%	-
Total	-4.5%	2.5%	0.8%	1.6%	-0.1%	0.7%	0.0%	-

(source: ABS Special Request Matrix, Census of Population and Housing, 1991 and 2001)

Table 12: Dwelling structure by family type, Sydney, 1991-2001

	Separate Houses	Semi Detached Dwellings	Flat in block under 4 storeys	Flat in block with 4 or more storeys	Flat attached to house	Other Dwellings	Not Stated	Total
1991								
Couple family with children	417,284	24,593	26,644	9,368	946	2,904	3,213	484,952
Couple family without children	185,877	22,743	34,727	17,685	1,323	2,839	2,098	267,292
One parent family	79,285	14,058	16,286	6,235	425	1,054	991	118,334
Other family	11,631	2,214	4,119	1,888	92	225	175	20,344
Total families	887,071	115,168	185,150	87,371	6,712	14,994	12,027	1,311,326
2001								
Couple family with children	429,027	38,803	31,377	12,792	742	1,680	2,549	516,970
Couple family without children	217,800	38,485	43,238	26,962	1,047	1,965	2,582	332,079
One parent family	102,058	21,925	20,181	7,596	496	934	943	154,133
Other family	10,704	2,701	4,366	3,073	76	174	181	21,275
Total families	978,664	172,799	226,316	125,328	5,953	12,454	14,035	1,538,243
Absolute Change 1991-2001								
Couple family with children	11,743	14,210	4,733	3,424	-204	-1,224	-664	32,018
Couple family without children	31,923	15,742	8,511	9,277	-276	-874	484	64,787
One parent family	22,773	7,867	3,895	1,361	71	-120	-48	35,799
Other family	-927	487	247	1,185	-16	-51	6	931
Total families	65,512	38,306	17,386	15,247	-425	-2,269	-222	133,535
Percentage Change 1991-2001								
Couple family with children	2.8%	57.8%	17.8%	36.5%	-21.6%	-42.1%	-20.7%	6.6%
Couple family without children	17.2%	69.2%	24.5%	52.5%	-20.9%	-30.8%	23.1%	24.2%
One parent family	28.7%	56.0%	23.9%	21.8%	16.7%	-11.4%	-4.8%	30.3%
Other family	-8.0%	22.0%	6.0%	62.8%	-17.4%	-22.7%	3.4%	4.6%
Total families	9.4%	60.2%	21.3%	43.3%	-15.3%	-32.3%	-3.4%	15.0%

(source: ABS Special Request Matrix, Census of Population and Housing, 1991 and 2001)

Table 13: Dwelling structure by family type, Sydney, 1991-2001 (%)

	Separate Houses	Semi Detached Dwellings	Flat in block under 4 storeys	Flat in block with 4 or more storeys	Flat attached to house	Other Dwellings	Not Stated	Total
1991								
Couple family with children	47.0%	21.4%	14.4%	10.7%	14.1%	19.4%	26.7%	37.0%
Couple family without children	21.0%	19.7%	18.8%	20.2%	19.7%	18.9%	17.4%	20.4%
One parent family	8.9%	12.2%	8.8%	7.1%	6.3%	7.0%	8.2%	9.0%
Other family	1.3%	1.9%	2.2%	2.2%	1.4%	1.5%	1.5%	1.6%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
2001								
Couple family with children	43.8%	22.5%	13.9%	10.2%	12.5%	13.5%	18.2%	33.6%
Couple family without children	22.3%	22.3%	19.1%	21.5%	17.6%	15.8%	18.4%	21.6%
One parent family	10.4%	12.7%	8.9%	6.1%	8.3%	7.5%	6.7%	10.0%
Other family	1.1%	1.6%	1.9%	2.5%	1.3%	1.4%	1.3%	1.4%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Percentage Change 1991-2001								
Couple family with children	-3.6%	-0.6%	-0.9%	-1.3%	-2.5%	-6.0%	-8.9%	-4.0%
Couple family without children	1.9%	2.0%	1.1%	3.2%	-3.1%	0.9%	8.9%	2.4%
One parent family	2.0%	-0.6%	0.4%	-2.7%	5.8%	4.6%	-0.2%	1.8%
Other family	-0.3%	-0.8%	-0.6%	0.7%	-0.1%	0.5%	0.2%	-0.2%
Total	-	-	-	-	-	-	-	-

(source: ABS Special Request Matrix, Census of Population and Housing, 1991 and 2001)

Table 14: Percentage of family type by dwelling structure, Sydney, 1991-2001 (%)

	Separate Houses	Semi Detached Dwellings	Flat in block under 4 storeys	Flat in block with 4 or more storeys	Flat attached to house	Other Dwellings	Not Stated	Total
1991								
Couple family with children	86.0%	5.1%	5.5%	1.9%	0.2%	0.6%	0.7%	100.0%
Couple family without children	69.5%	8.5%	13.0%	6.6%	0.5%	1.1%	0.8%	100.0%
One parent family	67.0%	11.9%	13.8%	5.3%	0.4%	0.9%	0.8%	100.0%
Other family	57.2%	10.9%	20.2%	9.3%	0.5%	1.1%	0.9%	100.0%
Total	67.6%	8.8%	14.1%	6.7%	0.5%	1.1%	0.9%	100.0%
2001								
Couple family with children	83.0%	7.5%	6.1%	2.5%	0.1%	0.3%	0.5%	100.0%
Couple family without children	65.6%	11.6%	13.0%	8.1%	0.3%	0.6%	0.8%	100.0%
One parent family	66.2%	14.2%	13.1%	4.9%	0.3%	0.6%	0.6%	100.0%
Other family	50.3%	12.7%	20.5%	14.4%	0.4%	0.8%	0.9%	100.0%
Total	63.6%	11.2%	14.7%	8.1%	0.4%	0.8%	0.9%	100.0%
Percentage Change 1991-2001								
Couple family with children	-3.1%	2.4%	0.6%	0.5%	-0.1%	-0.3%	-0.2%	-
Couple family without children	-4.0%	3.1%	0.0%	1.5%	-0.2%	-0.5%	0.0%	-
One parent family	-0.8%	2.3%	-0.7%	-0.3%	0.0%	-0.3%	-0.2%	-
Other family	-6.9%	1.8%	0.3%	5.2%	-0.1%	-0.3%	0.0%	-
Total	-3.8%	2.8%	0.5%	1.0%	-0.1%	-0.3%	-0.1%	-

(source: ABS Special Request Matrix, Census of Population and Housing, 1991 and 2001)

Table 15: Dwelling structure by age of residents, Sydney, 1991-2001

	Separate Houses	Semi Detached Dwellings	Flat in block under 4 storeys	Flat in block with 4 or more storeys	Flat attached to house	Other Dwellings	Not Stated	Total
1991								
Aged 0-14	599,938	44,750	46,201	14,092	3,370	3,620	4,999	716,970
Aged 15-24	406,578	38,506	55,564	22,382	3,514	4,293	4,178	535,015
Aged 25-34	372,481	52,796	89,259	38,750	3,993	5,381	4,991	567,651
Aged 35-44	401,543	37,814	49,017	21,363	2,770	3,478	4,084	520,069
Aged 45-64	522,424	41,352	52,537	25,497	3,101	7,403	4,927	657,241
Aged 65 and over	251,587	30,617	42,752	22,157	918	5,059	2,322	355,412
Total	2,554,551	245,835	335,330	144,241	17,666	29,234	25,501	3,352,358
2001								
Aged 0-14	628,945	70,797	60,484	24,314	1,604	3,670	5,016	794,830
Aged 15-24	386,344	49,964	57,546	34,970	1,453	3,700	3,566	537,543
Aged 25-34	364,567	75,578	105,627	63,413	2,472	4,584	4,985	621,226
Aged 35-44	431,216	62,550	70,736	35,843	1,764	4,123	4,364	610,596
Aged 45-64	651,415	77,778	76,033	42,016	1,996	8,371	6,227	863,836
Aged 65 and over	296,613	45,549	54,523	25,886	1,306	4,529	5,679	434,085
Total	2,759,100	382,216	424,949	226,442	10,595	28,977	29,837	3,862,116
Absolute Change 1991-2001								
Aged 0-14	29,007	26,047	14,283	10,222	-1,766	50	17	77,860
Aged 15-24	-20,234	11,458	1,982	12,588	-2,061	-593	-612	2,528
Aged 25-34	-7,914	22,782	16,368	24,663	-1,521	-797	-6	53,575
Aged 35-44	29,673	24,736	21,719	14,480	-1,006	645	280	90,527
Aged 45-64	128,991	36,426	23,496	16,519	-1,105	968	1,300	206,595
Aged 65 and over	45,026	14,932	11,771	3,729	388	-530	3,357	78,673
Total	204,549	136,381	89,619	82,201	-7,071	-257	4,336	509,758

Percentage Change 1991-2001								
Aged 0-14	4.8%	58.2%	30.9%	72.5%	-52.4%	1.4%	0.3%	10.9%
Aged 15-24	-5.0%	29.8%	3.6%	56.2%	-58.7%	-13.8%	-14.6%	0.5%
Aged 25-34	-2.1%	43.2%	18.3%	63.6%	-38.1%	-14.8%	-0.1%	9.4%
Aged 35-44	7.4%	65.4%	44.3%	67.8%	-36.3%	18.5%	6.9%	17.4%
Aged 45-64	24.7%	88.1%	44.7%	64.8%	-35.6%	13.1%	26.4%	31.4%
Aged 65 and over	17.9%	48.8%	27.5%	16.8%	42.3%	-10.5%	144.6%	22.1%
Total	8.0%	55.5%	26.7%	57.0%	-40.0%	-0.9%	17.0%	15.2%

(source: ABS Special Request Matrix, Census of Population and Housing, 1991 and 2001)

Table 16: Dwelling structure by age of residents, Sydney, 1991-2001 (%)

	Separate Houses	Semi Detached Dwellings	Flat in block under 4 storeys	Flat in block with 4 or more storeys	Flat attached to house	Other Dwellings	Not Stated	Total
1991								
Aged 0-14	23.5%	18.2%	13.8%	9.8%	19.1%	12.4%	19.6%	21.4%
Aged 15-24	15.9%	15.7%	16.6%	15.5%	19.9%	14.7%	16.4%	16.0%
Aged 25-34	14.6%	21.5%	26.6%	26.9%	22.6%	18.4%	19.6%	16.9%
Aged 35-44	15.7%	15.4%	14.6%	14.8%	15.7%	11.9%	16.0%	15.5%
Aged 45-64	20.5%	16.8%	15.7%	17.7%	17.6%	25.3%	19.3%	19.6%
Aged 65 and over	9.8%	12.5%	12.7%	15.4%	5.2%	17.3%	9.1%	10.6%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
2001								
Aged 0-14	22.8%	18.5%	14.2%	10.7%	15.1%	12.7%	16.8%	20.6%
Aged 15-24	14.0%	13.1%	13.5%	15.4%	13.7%	12.8%	12.0%	13.9%
Aged 25-34	13.2%	19.8%	24.9%	28.0%	23.3%	15.8%	16.7%	16.1%
Aged 35-44	15.6%	16.4%	16.6%	15.8%	16.6%	14.2%	14.6%	15.8%
Aged 45-64	23.6%	20.3%	17.9%	18.6%	18.8%	28.9%	20.9%	22.4%
Aged 65 and over	10.8%	11.9%	12.8%	11.4%	12.3%	15.6%	19.0%	11.2%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Percentage Point Change 1991-2001								
Aged 0-14	-0.7%	0.3%	0.5%	1.0%	-3.9%	0.3%	-2.8%	-0.8%
Aged 15-24	-1.9%	-2.6%	-3.0%	-0.1%	-6.2%	-1.9%	-4.4%	-2.0%
Aged 25-34	-1.4%	-1.7%	-1.8%	1.1%	0.7%	-2.6%	-2.9%	-0.8%
Aged 35-44	-0.1%	1.0%	2.0%	1.0%	1.0%	2.3%	-1.4%	0.3%
Aged 45-64	3.2%	3.5%	2.2%	0.9%	1.3%	3.6%	1.5%	2.8%
Aged 65 and over	0.9%	-0.5%	0.1%	-3.9%	7.1%	-1.7%	9.9%	0.6%
Total	-	-	-	-	-	-	-	-

(source: ABS Special Request Matrix, Census of Population and Housing, 1991 and 2001)

Table 17: Age groups by dwelling structure, Sydney, 1991-2001 (%)

	Separate Houses	Semi Detached Dwellings	Flat in block under 4 storeys	Flat in block with 4 or more storeys	Flat attached to house	Other Dwellings	Not Stated	Total
1991								
Aged 0-14	83.7%	6.2%	6.4%	2.0%	0.5%	0.5%	0.7%	100.0%
Aged 15-24	76.0%	7.2%	10.4%	4.2%	0.7%	0.8%	0.8%	100.0%
Aged 25-34	65.6%	9.3%	15.7%	6.8%	0.7%	0.9%	0.9%	100.0%
Aged 35-44	77.2%	7.3%	9.4%	4.1%	0.5%	0.7%	0.8%	100.0%
Aged 45-64	79.5%	6.3%	8.0%	3.9%	0.5%	1.1%	0.7%	100.0%
Aged 65 and over	70.8%	8.6%	12.0%	6.2%	0.3%	1.4%	0.7%	100.0%
Total	76.2%	7.3%	10.0%	4.3%	0.5%	0.9%	0.8%	100.0%
2001								
Aged 0-14	79.1%	8.9%	7.6%	3.1%	0.2%	0.5%	0.6%	100.0%
Aged 15-24	71.9%	9.3%	10.7%	6.5%	0.3%	0.7%	0.7%	100.0%
Aged 25-34	58.7%	12.2%	17.0%	10.2%	0.4%	0.7%	0.8%	100.0%
Aged 35-44	70.6%	10.2%	11.6%	5.9%	0.3%	0.7%	0.7%	100.0%
Aged 45-64	75.4%	9.0%	8.8%	4.9%	0.2%	1.0%	0.7%	100.0%
Aged 65 and over	68.3%	10.5%	12.6%	6.0%	0.3%	1.0%	1.3%	100.0%
Total	71.4%	9.9%	11.0%	5.9%	0.3%	0.8%	0.8%	100.0%
Percentage Point Change 1991-2001								
Aged 0-14	-4.5%	2.7%	1.2%	1.1%	-0.3%	0.0%	-0.1%	-
Aged 15-24	-4.1%	2.1%	0.3%	2.3%	-0.4%	-0.1%	-0.1%	-
Aged 25-34	-6.9%	2.9%	1.3%	3.4%	-0.3%	-0.2%	-0.1%	-
Aged 35-44	-6.6%	3.0%	2.2%	1.8%	-0.2%	0.0%	-0.1%	-
Aged 45-64	-4.1%	2.7%	0.8%	1.0%	-0.2%	-0.2%	0.0%	-
Aged 65 and over	-2.5%	1.9%	0.5%	-0.3%	0.0%	-0.4%	0.7%	-
Total	-4.8%	2.6%	1.0%	1.6%	-0.3%	-0.1%	0.0%	-

(source: ABS Special Request Matrix, Census of Population and Housing, 1991 and 2001)

Table 18: Selected incomes of households by dwelling type, Sydney, 2001

	Separate Houses	Semi Detached Dwellings	Flat in block under 4 storeys	Flat in block with 4 or more storeys	Flat attached to house	Other Dwellings	Not Stated	Total
Income under $400	121,995	32,059	51,276	19,658	1,417	3,577	2,930	232,912
% of income group	52.4%	13.8%	22.0%	8.4%	0.6%	1.5%	1.3%	100.0%
% of dwelling type	13.4%	19.8%	23.6%	16.3%	24.7%	30.1%	21.8%	16.2%
Income under $2000	136,632	21,688	14,862	13,996	231	453	1,228	189,090
% of income group	72.3%	11.5%	7.9%	7.4%	0.1%	0.2%	0.6%	100.0%
% of dwelling type	15.1%	13.4%	6.8%	11.6%	4.0%	3.8%	9.1%	13.1%

(source: ABS Special Request Matrix, Census of Population and Housing, 2001)

Table 19: Dwelling structure by place of enumeration 5 years earlier, Sydney, 2001

	Separate Houses	Semi Detached Dwellings	Flat in block under 4 storeys	Flat in block with 4 or more storeys	Flat attached to house	Other Dwellings	Not Stated	Total
2001								
Did not move	1,565,566	135,957	123,292	53,208	3,334	11,894	11,869	1,905,119
Have moved	819,447	166,285	169,467	91,569	4,610	10,555	9,577	1,271,512
Overseas in 1996	90,718	31,366	65,750	41,632	944	2,041	2,035	234,486
Not Stated	86,503	21,048	40,683	29,989	992	3,146	4,618	186,979
Total	2,759,100	382,216	424,949	226,442	10,595	28,977	29,837	3,862,116
% of mobility category								
Did not move	82.2%	7.1%	6.5%	2.8%	0.2%	0.6%	0.6%	100.0%
Have moved	64.4%	13.1%	13.3%	7.2%	0.4%	0.8%	0.8%	100.0%
Overseas in 1996	38.7%	13.4%	28.0%	17.8%	0.4%	0.9%	0.9%	100.0%
Not Stated	46.3%	11.3%	21.8%	16.0%	0.5%	1.7%	2.5%	100.0%
Total	71.4%	9.9%	11.0%	5.9%	0.3%	0.8%	0.8%	100.0%
% of dwelling type								
Did not move	56.7%	35.6%	29.0%	23.5%	31.5%	41.0%	39.8%	49.3%
Have moved	29.7%	43.5%	39.9%	40.4%	43.5%	36.4%	32.1%	32.9%
Overseas in 1996	3.3%	8.2%	15.5%	18.4%	8.9%	7.0%	6.8%	6.1%
Not Stated	3.1%	5.5%	9.6%	13.2%	9.4%	10.9%	15.5%	4.8%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

(source: ABS Special Request Matrix, Census of Population and Housing, 2001)

Table 20: Dwelling structure by birthplace of residents, Sydney, 1991-2001

	Separate Houses	Semi Detached Dwellings	Flat in block under 4 storeys	Flat in block with 4 or more storeys	Flat attached to house	Other Dwellings	Not Stated	Total
1991								
Australia	1,847,711	161,507	170,833	74,491	9,276	21,168	17,086	2,302,073
UK-Ireland	153,188	18,847	24,558	11,874	736	2,900	1,639	213,742
Asia	156,252	21,780	58,737	23,131	2,857	1,174	2,161	266,091
Europe	215,656	19,254	27,727	14,528	1,966	1,605	2,141	282,876
Middle East	56,223	4,037	14,282	4,021	1,094	376	555	80,588
Other Oceania	52,192	9,265	18,724	6,961	1,063	1,213	824	90,242
Other	60,465	9,265	16,932	7,948	491	550	807	96,458
Not Stated	12,864	1,880	3,536	1,286	184	249	288	20,287
Total	2,554,551	245,835	335,330	144,241	17,666	29,234	25,501	3,352,358
2001								
Australia	1,772,974	211,916	181,164	88,194	5,699	15,591	15,229	2,289,809
UK-Ireland	125,212	21,283	20,432	12,833	583	1,708	1,562	183,679
Asia	216,804	43,813	80,317	42,856	1,029	2,978	2,721	390,917
Europe	303,824	42,588	48,555	28,778	1,173	3,158	3,226	431,343
Middle East	65,608	8,648	15,648	4,818	226	572	581	96,091
Other Oceania	72,108	14,494	18,868	8,940	467	1,172	799	116,927
Other	71,599	14,865	18,897	10,263	357	557	838	117,465
Not Stated	130,971	24,608	41,068	29,760	1,061	3,241	4,881	235,885
Total	2,759,100	382,216	424,949	226,442	10,595	28,977	29,837	3,862,116

	Separate Houses	Semi Detached Dwellings	Flat in block under 4 storeys	Flat in block with 4 or more storeys	Flat attached to house	Other Dwellings	Not Stated	Total
Absolute Change 1991-2001								
Australia	-74,737	50,410	10,331	13,703	-3,577	-5,577	-1,856	-12,263
UK-Ireland	-27,976	2,436	-4,126	959	-153	-1,192	-76	-30,064
Asia	60,552	22,033	21,580	19,725	-1,827	1,804	560	124,825
Europe	88,168	23,334	20,827	14,250	-793	1,554	1,085	148,466
Middle East	9,385	4,611	1,366	797	-868	196	26	15,503
Other Oceania	19,916	5,229	144	1,979	-595	-41	-26	26,685
Other	11,134	5,600	1,965	2,315	-134	7	31	21,007
Not Stated	118,107	22,728	37,532	28,474	877	2,992	4,593	215,598
Total	204,549	136,381	89,619	82,201	-7,071	-257	4,336	509,758
Percentage Change 1991-2001								
Australia	-4.0%	31.2%	6.0%	18.4%	-38.6%	-26.3%	-10.9%	-0.5%
UK-Ireland	-18.3%	12.9%	-16.8%	8.1%	-20.8%	-41.1%	-4.7%	-14.1%
Asia	38.8%	101.2%	36.7%	85.3%	-64.0%	153.7%	25.9%	46.9%
Europe	40.9%	121.2%	75.1%	98.1%	-40.3%	96.8%	50.7%	52.5%
Middle East	16.7%	114.2%	9.6%	19.8%	-79.4%	52.2%	4.6%	19.2%
Other Oceania	38.2%	56.4%	0.8%	28.4%	-56.0%	-3.4%	-3.1%	29.6%
Other	18.4%	60.4%	11.6%	29.1%	-27.3%	1.3%	3.9%	21.8%
Not Stated	918.1%	1208.9%	1061.4%	2214.1%	476.9%	1202.0%	1594.1%	1062.7%
Total	8.0%	55.5%	26.7%	57.0%	-40.0%	-0.9%	17.0%	15.2%

(source: ABS Special Request Matrix, Census of Population and Housing, 1991 and 2001)

Table 21: Dwelling structure by birthplace of residents, Sydney, 1991-2001 (%)

	Separate Houses	Semi Detached Dwellings	Flat in block under 4 storeys	Flat in block with 4 or more storeys	Flat attached to house	Other Dwellings	Not Stated	Total
1991								
Australia	72.3%	65.7%	50.9%	51.6%	52.5%	72.4%	67.0%	68.7%
UK-Ireland	6.0%	7.7%	7.3%	8.2%	4.2%	9.9%	6.4%	6.4%
Asia	6.1%	8.9%	17.5%	16.0%	16.2%	4.0%	8.5%	7.9%
Europe	8.4%	7.8%	8.3%	10.1%	11.1%	5.5%	8.4%	8.4%
Middle East	2.2%	1.6%	4.3%	2.8%	6.2%	1.3%	2.2%	2.4%
Other Oceania	2.0%	3.8%	5.6%	4.8%	6.0%	4.1%	3.2%	2.7%
Other	2.4%	3.8%	5.0%	5.5%	2.8%	1.9%	3.2%	2.9%
Not Stated	0.5%	0.8%	1.1%	0.9%	1.0%	0.9%	1.1%	0.6%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
2001								
Australia	64.3%	55.4%	42.6%	38.9%	53.8%	53.8%	51.0%	59.3%
UK-Ireland	4.5%	5.6%	4.8%	5.7%	5.5%	5.9%	5.2%	4.8%
Asia	7.9%	11.5%	18.9%	18.9%	9.7%	10.3%	9.1%	10.1%
Europe	11.0%	11.1%	11.4%	12.7%	11.1%	10.9%	10.8%	11.2%
Middle East	2.4%	2.3%	3.7%	2.1%	2.1%	2.0%	1.9%	2.5%
Other Oceania	2.6%	3.8%	4.4%	3.9%	4.4%	4.0%	2.7%	3.0%
Other	2.6%	3.9%	4.4%	4.5%	3.4%	1.9%	2.8%	3.0%
Not Stated	4.7%	6.4%	9.7%	13.1%	10.0%	11.2%	16.4%	6.1%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

	Separate Houses	Semi Detached Dwellings	Flat in block under 4 storeys	Flat in block with 4 or more storeys	Flat attached to house	Other Dwellings	Not Stated	Total
Percentage Point Change 1991-2001								
Australia	-8.1%	-10.3%	-8.3%	-12.7%	1.3%	-18.6%	-16.0%	-9.4%
UK-Ireland	-1.5%	-2.1%	-2.5%	-2.6%	1.3%	-4.0%	-1.2%	-1.6%
Asia	1.7%	2.6%	1.4%	2.9%	-6.5%	6.3%	0.6%	2.2%
Europe	2.6%	3.3%	3.2%	2.6%	-0.1%	5.4%	2.4%	2.7%
Middle East	0.2%	0.6%	-0.6%	-0.7%	-4.1%	0.7%	-0.2%	0.1%
Other Oceania	0.6%	0.0%	-1.1%	-0.9%	-1.6%	-0.1%	-0.6%	0.3%
Other	0.2%	0.1%	-0.6%	-1.0%	0.6%	0.0%	-0.4%	0.2%
Not Stated	4.2%	5.7%	8.6%	12.3%	9.0%	10.3%	15.2%	5.5%
Total	-	-	-	-	-	-	-	-

(source: ABS Special Request Matrix, Census of Population and Housing, 1991 and 2001)

Table 22: Birthplace of residents by dwelling structure, Sydney, 1991-2001 (%)

	Separate Houses	Semi Detached Dwellings	Flat in block under 4 storeys	Flat in block with 4 or more storeys	Flat attached to house	Other Dwellings	Not Stated	Total
1991								
Australia	80.3%	7.0%	7.4%	3.2%	0.4%	0.9%	0.7%	100.0%
UK-Ireland	71.7%	8.8%	11.5%	5.6%	0.3%	1.4%	0.8%	100.0%
Asia	58.7%	8.2%	22.1%	8.7%	1.1%	0.4%	0.8%	100.0%
Europe	76.2%	6.8%	9.8%	5.1%	0.7%	0.6%	0.8%	100.0%
Middle East	69.8%	5.0%	17.7%	5.0%	1.4%	0.5%	0.7%	100.0%
Other Oceania	57.8%	10.3%	20.7%	7.7%	1.2%	1.3%	0.9%	100.0%
Other	62.7%	9.6%	17.6%	8.2%	0.5%	0.6%	0.8%	100.0%
Not Stated	63.4%	9.3%	17.4%	6.3%	0.9%	1.2%	1.4%	100.0%
Total	76.2%	7.3%	10.0%	4.3%	0.5%	0.9%	0.8%	100.0%
2001								
Australia	77.4%	9.3%	7.9%	3.9%	0.2%	0.7%	0.7%	100.0%
UK-Ireland	68.2%	11.6%	11.1%	7.0%	0.3%	0.9%	0.9%	100.0%
Asia	55.5%	11.2%	20.5%	11.0%	0.3%	0.8%	0.7%	100.0%
Europe	70.4%	9.9%	11.3%	6.7%	0.3%	0.7%	0.7%	100.0%
Middle East	68.3%	9.0%	16.3%	5.0%	0.2%	0.6%	0.6%	100.0%
Other Oceania	61.7%	12.4%	16.1%	7.6%	0.4%	1.0%	0.7%	100.0%
Other	61.0%	12.7%	16.1%	8.7%	0.3%	0.5%	0.7%	100.0%
Not Stated	55.5%	10.4%	17.4%	12.6%	0.4%	1.4%	2.1%	100.0%
Total	71.4%	9.9%	11.0%	5.9%	0.3%	0.8%	0.8%	100.0%

	Separate Houses	Semi Detached Dwellings	Flat in block under 4 storeys	Flat in block with 4 or more storeys	Flat attached to house	Other Dwellings	Not Stated	Total
Percentage Point Change 1991-2001								
Australia	-2.8%	2.2%	0.5%	0.6%	-0.2%	-0.2%	-0.1%	-
UK-Ireland	-3.5%	2.8%	-0.4%	1.4%	0.0%	-0.4%	0.1%	-
Asia	-3.3%	3.0%	-1.5%	2.3%	-0.8%	0.3%	-0.1%	-
Europe	-5.8%	3.1%	1.5%	1.5%	-0.4%	0.2%	0.0%	-
Middle East	-1.5%	4.0%	-1.4%	0.0%	-1.1%	0.1%	-0.1%	-
Other Oceania	3.8%	2.1%	-4.6%	-0.1%	-0.8%	-0.3%	-0.2%	-
Other	-1.7%	3.0%	-1.5%	0.5%	-0.2%	-0.1%	-0.1%	-
Not Stated	-7.9%	1.2%	0.0%	6.3%	-0.5%	0.1%	0.6%	-
Total	-4.8%	2.6%	1.0%	1.6%	-0.3%	-0.1%	0.0%	-

(source: ABS Special Request Matrix, Census of Population and Housing, 1991 and 2001)

Table 23: Dwelling structure by weekly rent, Sydney SD, 2001

	Separate Houses	Semi Detached Dwellings	Flat in block under 4 storeys	Flat in block with 4 or more storeys	Flat attached to a house	Other Dwellings	Not Stated	Total
2001								
$0-$99	25,579	15,074	22,028	7,262	771	852	709	72,275
$100-$199	41,868	14,952	38,563	9,652	2,010	2,487	1,028	110,560
$200-$299	45,726	16,535	42,455	20,036	712	1,221	951	127,636
$300-$399	17,217	10,432	16,064	16,062	217	439	454	60,885
$400 or more	14,079	9,319	6,668	11,487	130	516	414	42,613
Not Stated	5,683	2,746	4,636	2,148	121	265	222	15,821
Total	150,152	69,058	130,414	66,647	3,961	5,780	3,778	429,790
2001 (% of rental category)								
$0-$99	35.4%	20.9%	30.5%	10.0%	1.1%	1.2%	1.0%	100.0%
$100-$199	37.9%	13.5%	34.9%	8.7%	1.8%	2.2%	0.9%	100.0%
$200-$299	35.8%	13.0%	33.3%	15.7%	0.6%	1.0%	0.7%	100.0%
$300-$399	28.3%	17.1%	26.4%	26.4%	0.4%	0.7%	0.7%	100.0%
$400 or more	33.0%	21.9%	15.6%	27.0%	0.3%	1.2%	1.0%	100.0%
Not Stated	35.9%	17.4%	29.3%	13.6%	0.8%	1.7%	1.4%	100.0%
Total	34.9%	16.1%	30.3%	15.5%	0.9%	1.3%	0.9%	100.0%
2001 (% of renters in each dwelling								
$0-$99	17.0%	21.8%	16.9%	10.9%	19.5%	14.7%	18.8%	16.8%
$100-$199	27.9%	21.7%	29.6%	14.5%	50.7%	43.0%	27.2%	25.7%
$200-$299	30.5%	23.9%	32.6%	30.1%	18.0%	21.1%	25.2%	29.7%
$300-$399	11.5%	15.1%	12.3%	24.1%	5.5%	7.6%	12.0%	14.2%
$400 or more	9.4%	13.5%	5.1%	17.2%	3.3%	8.9%	11.0%	9.9%
Not Stated	3.8%	4.0%	3.6%	3.2%	3.1%	4.6%	5.9%	3.7%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

(source: ABS Special Request Matrix, Census of Population and Housing, 2001)

APPENDIX 2: FACTOR ANALYSIS

Factor analysis is mainly used as an exploratory or confirmatory tool (Kim and Mueller 1978). Factor analysis attempts to account for the variation in a number of variables using a small number of index variables, or factors (Manly 1994). Basically factor analysis techniques are used to reduce a set of indicators to a small number of new statistically generated variables. Each of these variables is a linear combination of the original variables, and each represents a common underlying factor (Manly 1994). In essence, the factors represent broad constructs which provide a useful basis for differentiating among geographical areas with similar characteristics.

Manly (1994) identifies three stages of a factor analysis. In the first stage, the *provisional factor loadings* are determined. In this exercise, principal components analysis (PCA) was used. PCA is one of the simplest multivariate methods. PCA takes a number of variables and finds combinations of these variables to produce indices that are uncorrelated. The lack of correlation means these indices are measuring different dimensions in the data. The indices are ordered so that the first index displays the largest amount of variation in the original data, the second index the second largest variation in the original data, and so forth.

This leads to the second stage of the factor analysis – *factor rotation*. By rotating the provisional factors obtained from stage one, the factors are transformed in order to find new factors that are easier to interpret. Factor rotation is usually orthogonal (e.g. varimax) as the new factors obtained in this second stage are then uncorrelated. The third stage of the analysis involves calculating the *factor scores*. These are the values for each individual factors.

It must be noted that factor analysis is certainly not as objective as other statistical methods. While there have been criticisms of factor analysis (see Chatfield and Collins 1980), the main reason for its use is for gaining insight into the structure of multivariate data. That is, factor analysis provides a simple statistical technique for beginning to 'unpack' the structure of large data sets so that a small number of important factors or dimensions can be collated. In order to side-step some of the concerns associated with factor analysis some researchers have used cluster analysis or multiple discriminant analysis. However, these techniques also have pitfalls. Knox (1987), for example, contends that the nature of cluster analysis makes inner city comparisons of residential typologies difficult, and in the search for broad level generalisations about urban residential structure, factor analysis is likely to remain the preferred option. Furthermore, by using a simple technique as factor analysis Jones (1969) contends that 'by classifying areas…we can make statements about the relative dispersal, concentration, or segregation…throughout the urban community as well as make predictions about individual behaviour in different types of areas – predictions that can be tested against appropriate individual data' (p. 9).

Variables used in the factor analysis

- Proportion of couple families without children
- Proportion of one parent families
- Proportion of persons aged 15 to 24 years
- Proportion of persons aged 35 to 44 years
- Proportion of persons aged over 65 years
- Proportion of households who earn less than $400 per week
- Proportion of persons employed as associate professionals
- Proportion of persons employed as tradespersons and related workers
- Proportion of persons employed as advanced clerical workers
- Proportion of persons employed as intermediate clerical workers
- Proportion of persons employed as labourers and related workers
- Proportion of semi detached dwellings
- Proportion of flats in a block of less than 4 storeys
- Proportion of households who own their dwelling
- Proportion of households who are purchasing their dwelling
- Proportion of households who rent privately
- Proportion of households who rent from a state housing authority
- Proportion of households paying more than $400 a week in rent
- Proportion of persons born overseas
- Proportion of persons separated or divorced