

## Chapter 3 The housing gap

### Key Findings

- In 2011, Australian's housing consumption has reduced by some 284,000 dwellings compared with housing consumption in 2001, after adjusting for population growth and distribution, and changes in age structure.
- In other words, an additional 284,000 dwellings would have been needed in 2011 to maintain the rate of housing consumption that existed in 2001.<sup>1</sup>
- Using housing consumption patterns from different base years highlights changes in housing consumption in recent years. If 2006 were the base year, the gap in 2011 would be 76,000 dwellings. If 1991 were the base year, the gap would be 133,000 dwellings.
- The difference between 1991-based, 2001-based and 2006-based estimates of the gap in 2011 is a measure of how Australians adjusted their housing consumption and pattern of household formation over the period, influenced by, among other things, supply and affordability constraints.
- 2001 represents something of a high water mark for Australia's housing consumption; the last decade has seen a reversal of the decades-long decline in household size, despite demographic trends such as population ageing pushing in the opposite direction.

### Introduction

This chapter reviews the balance between the 'underlying demand' for housing and the current housing supply, based on the 2011 Census of Population and Housing and revised population estimates.

The Council estimates and projects underlying demand primarily in order to assess whether the rate of housing production has been, is, or will be sufficient to meet the housing needs of a growing and changing population.

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1 These are based on living arrangements recorded in the 2001 Census applied to the Australian resident population at 30 June 2011.

## NHSC 2013 State of Supply Report: Changes in how we live – Chapter 3: The housing gap

Underlying demand is a theoretical construct. It is an estimate of how many households there would be — and accordingly how many primary dwellings would be needed — if the housing system (the housing market and various housing assistance measures) did not constrain people’s choices about their living arrangements. Accordingly, underlying demand is estimated by examining the demography of the population — its size, birth and death rates, migration, age distribution, gender mix and family formation patterns —and assessing its underlying propensity to produce households. However, a household is not measured as a person, couple, or family as such, but the occupants of a dwelling; this means that patterns or trends in housing consumption must be combined with demographic variables to estimate underlying demand. The formation of separate households and actual market demand for housing are constrained by whether there are dwellings available, and by a wide range of social and economic factors. All the factors that have influenced housing consumption in the past are implicitly included in measures of underlying demand.

In effect, then, the Council’s estimates of underlying demand are an extrapolation of past housing consumption patterns and trends. These estimates are adjusted for subsequent changes in the size, age structure, gender mix, and geographic distribution of the population, but not for changes in any other influences on housing consumption and production.

The Council’s previous estimates of underlying demand have been based on population data from the census, converted into household estimates by applying intercensal trends in the likelihood of people being members of households of various types and sizes, and projected in accordance with birth and death rates and assumptions about net international and interstate migration.

The release of data from the 2011 Census of Population and Housing has helped the Council ascertain what has actually been happening to housing consumption and household numbers over the decade since 2001. It has also enabled direct observation of net changes in housing supply as opposed to the Council’s cumulative estimates of net supply. The latter estimates start with the stock at the 2001 Census, adding subsequent cumulative dwelling completions<sup>2</sup> and subtracting estimated demolitions. In the absence of recent and comprehensive data, the Council’s estimates of stock losses are crude. As readers of previous reports would know, the Council’s estimate of the gap between supply and underlying demand also requires assumptions about the proportion of housing stock that is unavailable, for example second or holiday homes, dwellings vacant while undergoing renovation, and dwellings that at any one time are vacant because they are in transition from one occupier to another.

The Council’s report *Housing Supply and Affordability Issues 2012-13* and the immediately preceding Chapter in this report describe changes in housing supply and housing consumption (described as living arrangements in the earlier report) between

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2 Sourced from the ABS Building Activity Survey.

*NHSC 2013 State of Supply Report: Changes in how we live –  
Chapter 3: The housing gap*

2001 and 2011. The previous report (Chapter 5) also reviewed the Council's methodology, and the data on which it depends. It noted that improved processes for assessing and adjusting for the undercount in the 2011 Census of Population and Housing (Census), led to recognition of a large intercensal error in population estimates going back for a decade or more.<sup>3</sup> Previous population estimates were inflated and have been recast back to July 1991. The impact of inflated population estimates on the accuracy of household estimates is unlikely to be proportional, and is still being assessed. It is clear, however, that recalculating previous estimates using the same measures and revised data would involve prohibitive logistical and cost challenges. The earlier report foreshadowed that the Council might adopt a revised, albeit conceptually similar, approach to assessing the historical relationship between the supply of dwellings and number and size of households.

The remainder of this report describes and employs this approach.

This revised method generates a range of estimates of underlying demand by applying actual point-in-time age-specific housing consumption rates obtained from previous censuses (1991, 2001 and 2006) to the age structure of the population at a later point in time (in this report, 30 June 2011). In essence, the resulting estimates of underlying demand answer the question 'what would the demand for housing in 2011 be if, allowing for changes in the age and gender mix of the population, housing consumption patterns had remained unchanged since the base year?' The resulting estimates of underlying demand are then compared with the actual number of households (assuming one household per occupied dwelling) to estimate the gap. In addition, age-specific housing consumption rates are compared between 2001 and 2011 to help explain what has changed and guide the search for causation.

Previously the Council produced estimates and projections of underlying demand based primarily on assumptions about the continuation of trends in age-specific household formation rates (such as the declining propensity of young adults to form a new household) revealed by previous censuses. This approach is likely to be retained to project future numbers of households as a guide to future underlying and market demand assuming the continuation of observed trends in (rather than fixed rates of) household formation and housing consumption.

An advantage of the new measure for assessing historical underlying demand is that it uses a consistent data source for both underlying demand and supply. Supply is measured as the total number of dwellings at the census; intercensal changes in total supply measure net changes in the housing stock. The previous measure relied on adding estimates of net additions to housing supply (using assumptions based on limited and often dated information on demolitions and dwellings unavailable for occupation) to the occupied stock at the previous census.

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<sup>3</sup> NHSC (2013) *Housing Supply and Affordability Issues 2012-13* p.117. For further information see ABS 3250.0 - Information Paper: Ensuring the Quality of Rebased Population Estimates, June 2011.

## NHSC 2013 State of Supply Report: Changes in how we live – Chapter 3: The housing gap

The 2011 Census showed that over 10 per cent of all dwellings were occupied by visitors only (approximately 422,000) or were unoccupied (approximately 934,000) on Census night.<sup>4</sup> The proportion of unoccupied dwellings is slightly larger than in 2006 and reflects a range of factors. In a previous report<sup>5</sup> the Council identified from 2006 Census data that unoccupied dwellings are 1.8 times more likely to be located outside a capital city,<sup>6</sup> and particularly likely to be in coastal holiday destinations, whereas population growth, and hence demand for housing, are typically greater in or near capital cities and other areas where employment is expanding. In short, areas with high levels of vacant housing are likely to have a relatively large proportion of homes, apartments or shacks used as holiday residences, or to have a proportion of dwelling supply stranded by the movement of economic activity and jobs.

The reasons for dwellings being vacant on Census night have not been recorded since 1986. In that Census, the majority of unoccupied dwellings were holiday homes or were in transition (for sale, between tenants, undergoing renovation or about to be demolished).<sup>7</sup> In previous Council estimates of dwelling supply, these factors had to be taken into account when adjusting gross estimates of additions to the housing stock. Such adjustments are not required with the revised approach. In effect, the new measure assumes that the proportion of unoccupied dwellings at the latest census is the latest available estimate of the proportion of total dwelling supply that is not available for occupation by a newly formed household. While in theory the proportion of vacant dwellings should decline during periods of relatively low growth in housing supply, coinciding with relatively fast population growth, in practice the proportion of vacant housing has been comparatively stable, and actually increased slightly over the period from 2001 to 2011, when population growth substantially outstripped additions to housing supply.

The Council anticipates that the revised method — using point-in-time age-specific housing consumption rates to reveal changes in aggregate housing consumption and their housing supply consequences — will be clearer, easier to comprehend and interpret, and offer more scope for analysis.

Summarising the results of this method, the Council estimates that there were around 284,000 fewer occupied dwellings (which equate to households)<sup>8</sup> in 2011 than there

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4 NHSC (2013) Housing Supply and Affordability Issues p.21.

5 NHSC (2010) 2<sup>nd</sup> State of Supply Report, p.37.

6 NHSC (2010) 2<sup>nd</sup> State of Supply Report, p.37 see Table 3.5 Unoccupied private dwellings by capital city and balance of state for a State by State breakdown.

7 See NHSC (2010) 2<sup>nd</sup> State of Supply Report, page 38 for discussion of census data on reasons for vacancies.

8 In the ABS census dictionary: A household is defined as one or more persons, at least one of whom is at least 15 years of age, usually resident in the same private dwelling. Under this definition, all occupants of a dwelling form a household and complete one form. Therefore, for Census purposes, the total number of households is equal to the total number of occupied private dwellings as a Census form is completed for each household from which dwelling information for the household is obtained. ABS 2013 2901.0 - Census Dictionary, 2011

<http://www.abs.gov.au/ausstats/abs@.nsf/Lookup/2901.0Chapter34902011> (accessed 03/07/2013).

would have been if housing consumption patterns in 2011 were the same as they were in 2001 (Table 3.5). Looking at the States and Territories, initial results from the new measure continues to show a gap (between the number of occupied dwellings in 2011 and the number there would have been if housing consumption rates in 2001 had continued) in New South Wales and Western Australia, a larger gap than previously estimated in Victoria and South Australia, and a smaller change in housing circumstances in Queensland than previously measured.<sup>9</sup> As explained in Chapter 1, these estimates do not purport to be the balance between *market* demand and supply at a point in time. Rather, they reflect changes in how households occupy available dwellings.<sup>10</sup> Supply-side issues (like the pace and nature of additions to supply, prices and home loan interest rates) may be the main reason for a gap, but demand-side factors are also relevant (for example, changes in buying power arising from the level and distribution of real household income; growth or decline in the number of households associated with increased or reduced rates of family breakdown; and changing housing preferences associated with the timing and number of children). Further analysis is required to ascertain the causes.

Turning to the effect and meaning of results from different base-years, changes in housing consumption since 1991 point to 2001 being a high point in housing consumption and housing supply, with more separate households and dwellings across nearly all age groups than was the case in the censuses before or since.

It is not yet possible to conclude what has caused the decline in the rates of household formation and housing consumption since 2001. The decline might reflect inadequate additions to supply relative to population growth, or it might be that fewer homes are being built in response to changes in people's preferences and capacity to purchase or rent a home. The Council believes that there is an element of both. Stretched affordability and a lack of additional housing supply in areas with access to employment opportunities are likely to have affected some people's ability and willingness to form new households.

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9 A State-by-State analysis of the changing patterns of housing consumption will be published in future. These initial results are based on estimates of the gap on a State and Territory basis which were undertaken prior to the release of final estimated resident population numbers for 2001 and 2011. The results may change when the recast Estimated Resident Population figures are incorporated.

10 Occupied dwellings are counted by place of enumeration in the Census while household reference persons are counted by place of usual residence. They are not reconciled, so in any given suburb a dwelling may be counted as unoccupied while the household who usually live there are also counted as living in that suburb. This measure avoids the problem by counting the number of households usually resident as the number of occupied dwellings.

## Households, occupied dwellings and the Census

The gap between how many households there are, and how many there would be if, after adjusting for changes in the size and demographic structure of the population, past household formation trends had continued, suggests that there is a potential housing shortage, deteriorating housing affordability, or something else that has reduced the formation of new households.

In the census, and indeed logically, the number of households equals the number of occupied dwellings. Therefore, fewer households means fewer occupied private dwellings. Looking at the difference between the growth in underlying demand (assessed as the continuation of past rates of consumption) and the growth in the actual number of households (as measured in occupied dwellings in the census) is equivalent to comparing the increase in underlying demand with net growth in the stock of occupied dwellings over the same period.

The census records each person's status in a household. This analysis focuses on the household member recorded as the household reference person. The household reference person is used as the starting point for determining relationships between the usual residents of a household.

From census data, the Council has identified those people who were recorded as either the household reference person in a family household,<sup>11</sup> or where more than one family reside in the household the household reference person in the first family,<sup>12</sup> and those recorded as the household reference person in a non-family household such as a group household. In a single person household, that person is the household reference person.

Table 3.1 and Figure 3.1 show the proportion of people in each five-year age group recorded as a household reference person at the 1991, 2001, 2006 and 2011 Censuses. The proportion of people recorded as a household reference person increases rapidly from 20 per cent in the 20-24 year age-group to around 50 per cent

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11 A family is defined by the ABS as two or more persons, one of whom is at least 15 years of age, who are related by blood, marriage (registered or de facto), adoption, step or fostering, and who are usually resident in the same household. Each separately identified couple relationship, lone parent-child relationship or other blood relationship forms the basis of a family. Some households contain more than one family.

12 A maximum of three families can be coded to a household. Data for the most recent two censuses (2006 and 2011) are also available for people who were recorded as reference person in a second or third reference in a family. For 2001 those recorded as the second reference person were identified. The Council have not counted additional family reference persons because there can only be one household in a private occupied dwelling. In 2001 there were 56,000 second household reference persons recorded in the Census (third reference persons were not recorded). In 2006 there were 93,000 (and 3,000 third reference persons) and in 2011 there were 128,000 (and 5,000 third reference persons).

in the 35-39 year age group. It continues to increase gradually and less consistently to nearly 60 per cent for those aged 75 and older.

**Table 3.1 Share of persons in each age group recorded as a household reference person (propensity by age to form a separate household) by age group, Australia, 1991, 2001, 2006 and 2011**

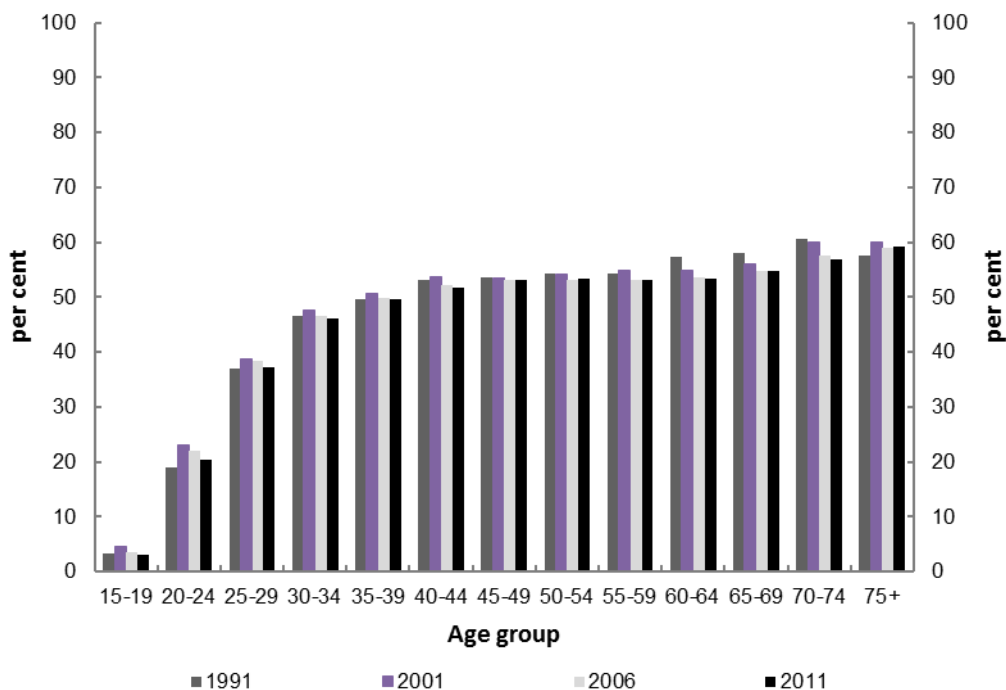
	1991	2001	2006	2011
	per cent			
<b>15-19</b>	3.3	4.6	3.6	3.0
<b>20-24</b>	19.1	23.1	22.0	20.4
<b>25-29</b>	37.1	38.8	38.5	37.2
<b>30-34</b>	46.5	47.6	46.5	46.1
<b>35-39</b>	49.7	50.7	49.9	49.7
<b>40-44</b>	53.2	53.7	52.1	51.8
<b>45-49</b>	53.7	53.4	53.1	53.2
<b>50-54</b>	54.4	54.3	53.1	53.4
<b>55-59</b>	54.2	54.9	53.1	53.1
<b>60-64</b>	57.4	55.0	53.7	53.4
<b>65-69</b>	58.1	56.0	54.8	54.7
<b>70-74</b>	60.7	60.0	57.5	56.9
<b>75+</b>	57.7	60.1	59.1	59.3
<b>Total</b>	43.1	45.6	44.9	44.7

Source: Australian Bureau of Statistics Censuses of Population and Housing 1991, 2001, 2006 and 2011.

Note: 2006 and 2011 data are based on place of usual residence. Only persons recorded as household reference person of the family in a household, or the first family where more than one family reside in the household, or as household reference person in a non-family household are included. 1991 and 2001 based on 1 per cent Census sample, with visitors excluded as equivalent to place of usual residence. 1991 data includes all household/family reference persons and lone person households making it possible to count more than one household per dwelling in 1991, however the small number of dwellings with two or more families is unlikely to affect the results significantly. 2001 data includes reference person in primary family and reference person in non-family household.

A change in the age structure of the population will lead to a different number of households for a given population size. For example, population ageing (a higher proportion of people in older age groups) will increase the number of households because older people are likely to live in smaller households, mostly as couples or lone persons.

**Figure 3.1 Share of people recorded as household reference person, Australia, by age group, 1991, 2001, 2006 and 2011**



Source: Australian Bureau of Statistics Censuses of Population and Housing 1991, 2001, 2006 and 2011.  
Note: 2006 and 2011 data based on place of usual residence. Only persons recorded as household reference person of the family in a household, or the first family where more than one family reside in the household, or as household reference person in a non-family household are included. 1991 and 2001 based on 1 per cent census sample, with visitors excluded as equivalent to place of usual residence. 1991 data includes household/family reference (so does not exclude additional family references in same household) and lone person household. 2001 data includes reference person in primary family and reference person in non-family household.

It is notable that compared with 2001, the proportion of people recorded as a household reference person in 2011 was smaller in all age groups, particularly among the younger and older age groups. However, the comparison between 1991 and 2011 is not as clear cut. While the proportion of people recorded as a household reference person was smaller in 2011 in most age groups, this was not the case for all age groups and the overall rate was actually higher.<sup>13</sup>

The rise in the overall proportion of household reference persons in 2011 compared with 1991 partly reflects the ageing of the population over the period, although ageing is only one of a number of factors, as is evident from the smaller proportion of household reference persons in 2011 compared with 2001. People aged 65 years and over as a proportion of the population aged 15 years and over increased from 14.5

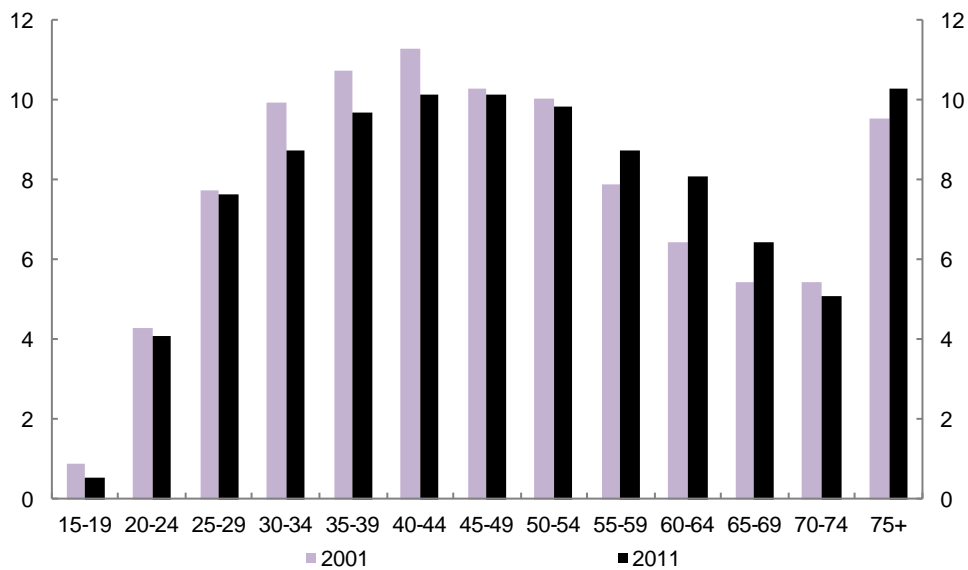
<sup>13</sup> As noted in table 3.1 there is possibly some double counting of household reference people in 1991 but not enough to affect the results significantly.



per cent in 1991 to 17.1 per cent in 2011.<sup>14</sup> Other things being equal, an increasing proportion of older people, combined with their greater likelihood of living in a small household (and thus greater likelihood of being the household reference person), will increase the total number of households.

Figure 3.2 shows the age distribution of households in 2011 compared with 2001. Ageing of the population is very evident, with proportionately fewer households in the younger age groups and, conversely, proportionately more in the older age groups. The Council’s approach to assessing the balance between housing supply and underlying demand intentionally controls for the effect of population growth and population ageing but measures the aggregated effect of changes over time in age-specific propensities to form households (as in Figure 3.1). The emergence of a positive or negative difference in the aggregated housing consumption rate between any two years will be the outcome of changes since the base year in these age-specific propensities. The real challenge, of course, is to decipher the underlying reasons for these changes.

**Figure 3.2 Percentage distribution of households by age of household reference person, Australia 2001, and 2011**



Source: NHSC calculations based on ABS Censuses of Population and Housing 2001, and 2011 and ABS (2013) Australian Demographic Statistics 2011 Census Edition — Final, Cat no. 3101.

14 ABS 2012, *Australian Demographic Statistics*, June Quarter 2012, cat no 3101.0.

## Number of households

As only one person is identified as a reference person in a household, the total number of reference people should equate to the number of households. However, because every census misses some people in its count on Census night, simply adding together all the household reference people recorded in a census does not necessarily produce a correct estimate of the number of households at census time. In 2011, the Australian Bureau of Statistics (ABS) found that the undercount of people was equivalent to 1.7 per cent of the population. It has not provided an estimate of the undercount of households.

In this report the Council has estimated the number of households by multiplying the proportion of household reference persons recorded in the census in each age group (split by gender) with the number of people in each age group by gender in the estimated resident population (ERP)<sup>15</sup> — the ABS' adjusted estimate of the population usually resident that includes those missed in the census count.<sup>16</sup> A state and territory analysis using this method will be published in future.

The total number of households (assuming only one household per occupied dwelling) produced by this method is shown in Table 3.2. The ABS has not yet published estimates of the number of households for 2011, and is not planning to publish such estimates or household projections before 2014.

**Table 3.2 Estimated number of households (occupied dwellings)**

	Year ending June 30			
	1991	2001	2006	2011
Australia	5,830,000	7,004,000	7,367,000	8,063,000

Source: NHSC calculations based on Australian Bureau of Statistics (ABS) Censuses of Population and Housing 1991, 2001, 2006 and 2011 and ABS (2013) Australian Demographic Statistics 2011 Census Edition — Final, Table 59. Estimated Resident Population By Single Year Of Age, Australia (final estimates rebased to the 2011 Census and recast estimates back to September 1991) Cat no. 3101.

Note: NHSC estimates for 2006 and 2011 are based on the characteristics defined by place of usual residence. As place of usual residence is not available for 2001 and 1991, people recorded as visitors are excluded.

Estimates assume one household per dwelling.

The estimates exclude people recorded in non-private dwellings (NPD) from the number of households.

Data are rounded to the nearest thousand.

15 ERP as published June 2013. The ABS has made a one-off revision to historical ERP data from September 1991 to June 2006. The process used to implement these revisions has been referenced as 'recasting'. (ABS 2013, 3101.0 - Australian Demographic Statistics, Dec 2012). These recast estimates have been used in the calculations for this chapter.

16 For example, in 2011 in Australia 44.36 per cent of women aged between 35-39 years were recorded as a household reference person. The ERP for this group was 791,706. Therefore the Council estimate that there were 432,563 households in Australia ( $791,706 \times 0.4436$ ) with a female household reference person aged 35-39 years. This was repeated for each five-year age and sex group for those aged 15 years and over for Australia for the censuses taken in 1991, 2001, 2006 and 2011.

The Council's approach to estimating the number of households (occupied dwellings) will not produce the same figures as future ABS estimates of the number of households. There are a number of potential reasons for future ABS household estimates to differ from those produced by the Council using census data and the ABS' adjusted estimates of resident population.<sup>17</sup>

Analysis throughout the rest of this chapter compares household numbers produced by the Council for differing time periods. Because the Council's analysis looks at how the distribution of households' circumstances have changed over time, differences in the ABS and Council measures should not invalidate the conclusions.

This issue is likely to arise again in the context of future publication by the Council of the projected number of households from 2011 to 2031. The number of households (occupied dwellings) estimated to measure the gap in 2011 differs from the number of households estimated in 2011 as the base point for projection of the number and types of future households.<sup>18</sup> This issue will be addressed in future publications when updated household projections are published. The most important thing about both sets of estimates is how they highlight the changes in Australians' housing circumstances and the likely reasons for those changes.

## 2011 — Have housing circumstances changed and by how much?

The next step in the analysis is to compare housing circumstances across different periods. Taking household reference rates from a previous period allows the Council to compare the number of households there would be if those same circumstances were in place for a different population size and composition at a different point in time (for example if the age-related propensities observed in 2001 were applied to the population in 2011).

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17 Different measurement techniques are likely to produce different estimates of the absolute numbers of households. The five year age group 'headship' count used here will not produce as accurate an estimate of the absolute number of households (occupied dwellings) in 2011 as the ABS is likely to produce with a more sophisticated estimation method and different treatment of the census undercount. The analysis in this chapter assumes households in the census are representative of those not included in the census which may not be the case. It is plausible, for instance, that the person undercount is largest for people in single person households, with the effect that the aggregated household undercount is proportionally larger than the person undercount.

18 The 2011 estimates of the number of households in this chapter are similar to the number of occupied dwellings in the Census and represent the occupied housing supply. The number of households in the Council's projections (to be published later) will not be based on occupied dwellings but on the likelihood of each individual belonging to a particular household type. As this alternate ex-ante estimate of the number of households is not constrained to the number of occupied dwellings it is likely to be higher than ex-post counts.

NHSC 2013 State of Supply Report: Changes in how we live –  
Chapter 3: The housing gap

In other words, this step is equivalent to an ‘all other things being equal’ experiment. The population size, age/gender and geographic split are set at the 2011 level. Meanwhile, the proportion of people who are household reference persons is varied in accordance with the propensities in earlier censuses in each gender and age group. This allows comparison between present and past circumstances. The difference between the two quantifies how circumstances have changed — whether the 2011 population, after adjusting for gender and age, is living in relatively more or fewer households (and therefore occupied dwellings) than might have been expected if past housing consumption patterns had continued.

The emergence of fewer than expected dwellings may or may not indicate impediments to the efficiency of the supply-side in recognising and responding to changes to emerging demand. While the Council believes that the availability and cost of housing are likely to be a factor, changing social and economic trends are also likely to have had an influence.

Table 3.3 provides estimates of how many occupied dwellings there would have been in June 2011 if the likelihood of being a household reference person the 1991, 2001, 2006 and 2011 censuses (by age group and gender) is applied to the estimated resident population at June 2011, split by age group and gender. A key finding is that there would have been more households (occupied dwellings) in Australia than was actually the case in each subsequent census. In other words, there were relatively fewer households in 2011 than there would have been if the population continued to consume housing as in the past.

**Table 3.3 Estimated number of households at 30 June 2011 based on household formation propensities in 1991, 2001, 2006 and 2011**

	Base year			
	1991	2001	2006	2011
Australia	8,196,000	8,347,000	8,140,000	8,063,000

Source: NHSC calculations based on ABS Censuses of Population and Housing 1991, 2001, 2006 and 2011 and ABS (2013) Australian Demographic Statistics 2011 Census Edition — Final, Table 59. Estimated Resident Population, Australia (final estimates rebased to the 2011 Census and recast estimates back to September 1991) Cat no. 3101.

Note: Years are year ending June 30. Data is rounded to the nearest thousand.

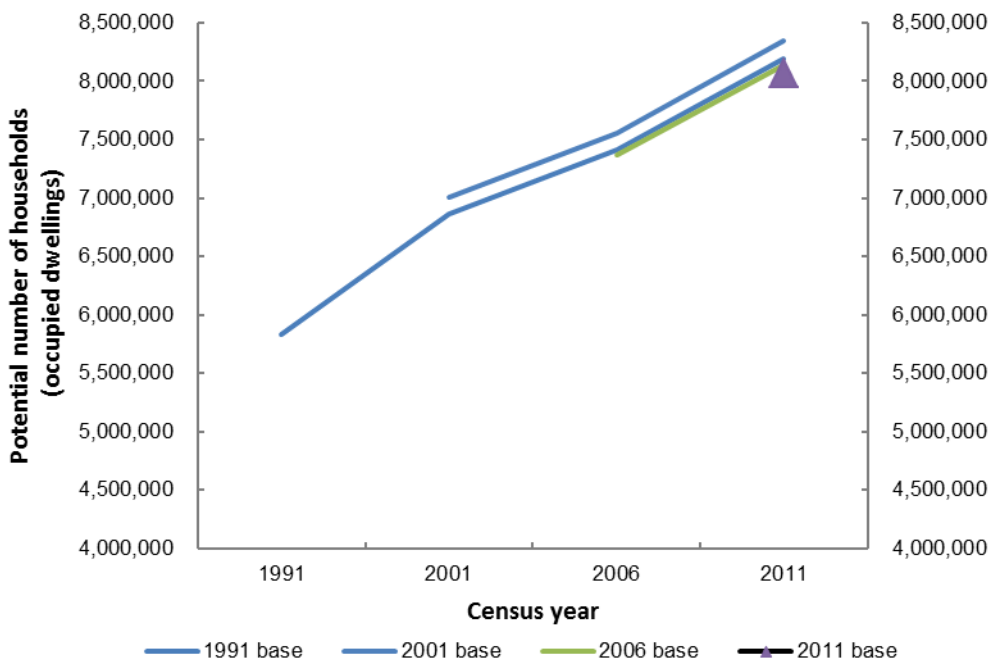
In 2011, there were 284,000 fewer households than would have been observed had the 2001 likelihood of being a household reference person remained unchanged.

Of the censuses analysed, there is a bigger difference between patterns in housing consumption and the resulting number of households when 2001 is used as the comparison base year, than when either 1991 or 2006 is used as the comparison base year.

Figure 3.3 shows the number of households produced by applying the household reference proportions (by gender and age group) in 1991, 2001, 2006 and 2011 to the population in the comparison base year and subsequent census years. The red line shows the number of households there would be if housing consumption patterns seen in 2001 continued from 2001 to 2006 and 2011. The 2001 patterns show a

noticeably larger level of underlying demand than is shown when using other base years, further illustrating that it was a ‘high water mark’ for housing consumption patterns.

**Figure 3.3 Underlying housing demand for varying consumption patterns, Australia (number of households)**



Source: NHSC calculations based on ABS Censuses of Population and Housing 1991, 2001, 2006 and 2011 and ABS (2013) Australian Demographic Statistics 2011 Census Edition — Final.  
Note: Each line shows the number of households that would be produced by the Council's methodology for each set of household reference propensities. When the reference base and the period are the same (for example the 2006 reference base in 2006) the figure is the Council's estimate of the actual number of households at that point.

### The housing ‘gap’ in 2011

As noted above, the Council estimates that compared with living arrangements in 2001 there were around 284,000 fewer occupied private dwellings in 2011 than there would have been if housing consumption preferences and opportunities in 2011 were the same as they were in 2001.

The comparison with the 2001 base (household references proportions in 2001) is conceptually consistent with previous estimates from the Council of the balance between underlying housing demand and supply since 2001, but different in two key respects.

NHSC 2013 State of Supply Report: Changes in how we live –  
Chapter 3: The housing gap

The Council's previously published cumulative housing shortfall in 2011 used an underlying demand measure incorporating a dynamic element. For the period 2001 to 2006, underlying demand was measured by the projected number of households in each year as published in the ABS Household projections. It was assumed to evolve each year in line with changes seen over the four censuses up to and including 2001 — so, for example, the increase in underlying demand in any intercensal year (between 2001 and 2006) was driven partly by population growth and structure and partly by an assumed continuation of changes in household formation propensities seen over the two preceding decades.

After 2006 the household formation component of Council's measure of underlying demand was modelled from the likelihood of a change in living arrangements measured from changes between 2001 and 2006 censuses.<sup>19</sup>

The housing shortfall estimates produced by the new measure in this report do not include this dynamic 'evolving' element of household formation. Instead, estimates of growth in underlying demand are derived from population and structure and by applying housing consumption patterns<sup>20</sup> observed at the census in the comparison base year (1991, 2001 or 2006) to the 2011 population.

The other major difference is that dwelling supply growth is taken from the observed increase in the number of occupied dwellings estimated from the census. Unlike the previous measure there is no need to adjust the flow of new dwellings being built for demolitions and for a certain share being vacant, which is desirable because the information available on demolitions and vacancies is incomplete and is often dated.

Although the exclusion of second homes and other so-called vacant dwellings clearly excludes an element of supply that could conceivably be made available for additional households, the proportion of vacant stock has been fairly constant over time and, as stated above, areas with relatively large proportions of vacant stock tend to be areas of low demand. In any event, the focus of this report is on the difference between additions to housing supply and consumption since the base year, and what they would have been if households and housing stock continued to develop in accordance with propensities in the base year. Since the same definition of supply is used to make this comparison, and it includes all dwellings that are occupied in the base and later periods, the exclusion of vacant properties has little practical import.

Table 3.4 provides a comparison of the two approaches.

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19 Measures of underlying demand previously published for 2007 to 2011 were drawn from household projections modelled by McDonald and Temple using net transition probabilities. This is discussed at length in previous Council reports, for example on pages 152-159 of the *State of Supply Report 2011*. The Council will publish future projections of the potential underlying demand (the projected number of households) based on the model but will not be using them to calculate a housing 'gap'.

20 Estimates in this report are based on snapshots of housing consumption patterns as observed at each census whereas previous reports have subtracted estimated occupied dwellings from the projected number of households based on modelling previously observed household formation patterns.

**Table 3.4 Housing gap at end-June 2011 under previous and new methodologies**

Concept	Previous method	New method (census years)	New method (non-census years)
<b>Underlying Demand</b>	<p>Cumulative growth in demand measured by: Age-specific household formation patterns from four censuses (up to 2001) applied to Age breakdown of estimated resident population projected to 2006 and Age-specific patterns of how people transition between household types (over the period 2001-2006) applied to Age breakdown of estimated resident population projected from 2006</p>	<p>Age-specific housing consumption patterns from census base year (2001) applied to Age breakdown of population in current census year (2011)</p>	<p>Age-specific housing consumption patterns from base census year (2001 and or 2006) applied to Age breakdown of estimated resident population projected for current year</p>
<b>Minus</b>			
<b>Housing Supply</b>	<p>Cumulative growth in supply measured by: Number of dwellings at most recent census plus Construction activity since most recent census discounting for Estimates of housing stock losses since most recent census and Estimates of housing vacancy changes since most recent census</p>	<p>Age-specific housing consumption patterns from current census year (2011) applied to Age breakdown of population in current census year (2011)</p>	<p>Age-specific housing consumption patterns from most recent census applied to Age breakdown of population from most recent census and Construction activity since most recent census discounting for Estimates of housing stock losses since most recent census and Estimates of housing vacancy changes since most recent census</p>
<b>Equals 'Gap'</b>	228,000 dwellings in 2011	284,000 dwellings in 2011	

## NHSC 2013 State of Supply Report: Changes in how we live – Chapter 3: The housing gap

Table 3.5 compares previously published estimates of the gap for the year ending June 2011, and that produced by the new measure using 1991, 2001 and 2006 patterns of housing consumption. The key point to consider is that the gap produced by the new measure is simply an indication of how living arrangements have changed between 2011 and each of these points in time, expressed as a number of households or occupied private dwellings (assuming only one household per dwelling).

This method cannot estimate change year-on-year; it can only compare two points in time when the proportion of household reference persons is recorded, notably at the 5-yearly Census of Population and Housing, although a hybrid measure could be used that adds an estimate of annual net additions to housing stock to the number observed at the last census, and applies housing consumption propensities in the base year to the estimated number of households in each age category in the target year.

**Table 3.5 Housing gap at end-June 2011 comparing previous and new measures**

	Previous estimate of cumulative gap	1991 base	2001 base	2006 base
Australia	228,000	133,000	284,000	76,000

Source: NHSC calculations based on ABS Censuses of Population and Housing 1991, 2001, 2006 and 2011 and ABS (2013) *Australian Demographic Statistics 2011 Census Edition — Final*. cat no. 3101.0.

Note: Estimates are rounded to the nearest thousand.

Results for the housing ‘shortfall’ using the 2001 census base are higher than previously published estimates. Underlying demand estimates for 2001 to 2006 under the previous measure incorporated projected population growth for that period that was lower than actual population growth over the period. A crude adjustment of 2.5-2.6 people per household would have led to around 60-65,000 households more than the existing estimate of underlying demand between 2001 and 2006. Such an adjustment would mean the housing shortfall was larger by the same amount.

The population at June 2011 lived in comparatively fewer occupied dwellings than would have been expected if the housing consumption patterns of 20 years ago had continued. There were a smaller number of households in 2011 than there would have been if the population in 2011 had the same living arrangements as measured in the 1991 Census.

## The housing ‘shortfall’ in 2006

Overall this analysis supports a key point made in chapter 5 of *Housing Supply and Affordability issues 2012-13*. A larger change in housing consumption patterns actually took place from 2001 to 2006, than from 2006 to 2011.



NHSC 2013 State of Supply Report: Changes in how we live –  
Chapter 3: The housing gap

Table 3.6 compares estimates for the gap produced by the previous method for end-June 2006, and that produced by the new method using 1991 and 2001 consumption patterns (the equivalent comparison as Table 3.5). The difference between previous and new estimates is substantial.

**Table 3.6 Housing shortfall at end-June 2006 under previous and new measures**

	Estimate using previous measure (b)	Estimates using new measure(a)	
		1991 base	2001 base
Australia	22,000	41,000	188,000

Source: (a) NHSC calculations based on ABS Censuses of Population and Housing 1991, 2001, 2006 and 2011 and ABS (2013) *Australian Demographic Statistics, December Quarter 2012* cat no. 3101.0.

(b) Unpublished estimate of gap at 2006, NHSC calculations using *Australian Demographic Statistics, December Quarter 2010*. Table 20 Projected number of households by State at June 2006, and building completions data adjusted for vacancies and demolitions.

Note: Estimates rounded to the nearest thousand.

The results in Table 3.6 show a shortfall of a potential 188,000 occupied dwellings emerging between 2001 and 2006. This suggests that there was a larger adjustment in housing consumption patterns across the country between 2001 and 2006 than between 2006 and 2011 as almost two thirds of the 284,000 gap recorded in 2011 had already emerged by 2006. This was also demonstrated in the Council’s previous report by compositional analysis of the sources of change in household formation over the intercensal periods between 1961 and 2011.<sup>21</sup> At an aggregate national level, this was not apparently due to substantial demand pressure driven by a relatively high rate of population growth in the earlier period (the rate of population growth, was higher between 2006 and 2011 than between 2001 to 2006),<sup>22</sup> nor to a relatively low rate of building activity (gross new dwelling completions averaging 150,000 per year over both periods). Other factors were at work. At the state and territory level, initial results suggest there were departures from the national average that could account for part of the national reduction in housing consumption in the period between 2001 and 2006, but more work is required to identify and quantify the various possible sources at regional, state and national levels.

21 NHSC (2013) *Housing Supply and Affordability Issues 2012-13* p.109.

22 ABS (2013) *Australian Demographic Statistics, Dec 2012* cat no 3101.0 says the ‘final rebased ERP of Australia at 30 June 2011 was 22,340,000 persons, an increase over the most recent intercensal period (2006-2011) of 1,889,100. During this five year period, the population grew by 9.2 per cent compared with 6.1 per cent for the previous intercensal period (2001-2006) where growth was 1,176,300’.

## What housing circumstances changed between 2001 and 2011?

Results from the 2011 Census showed the population of Australia was not quite as large as previously estimated, particularly in the 15-19 and 20-24 year age groups. It also recorded a shift in the distribution of the population among the States and Territories. Queensland in particular had less people resident in 2011 than previously estimated.<sup>23</sup>

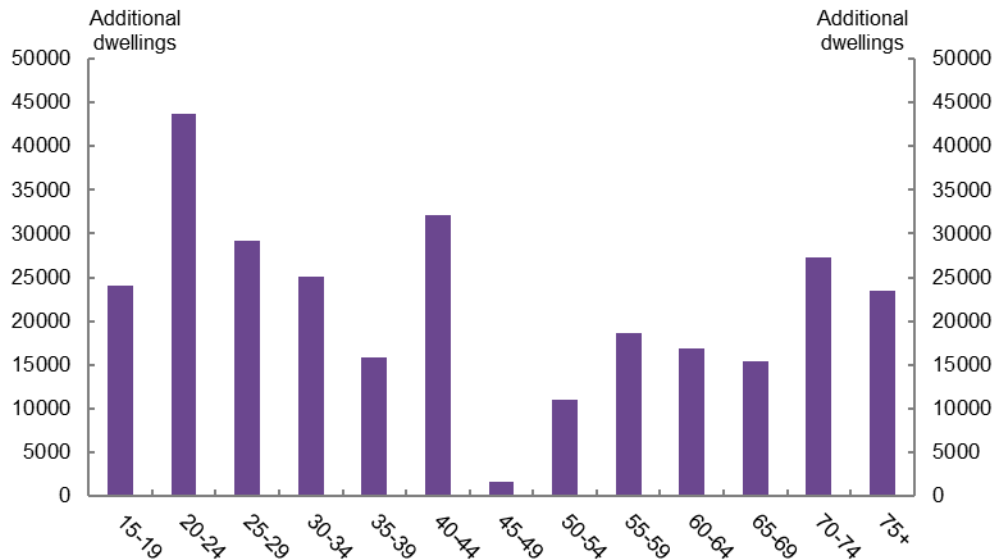
There is an element of circularity between housing consumption patterns and population growth. Higher rates of population growth are (at least in the short term before the housing stock adjusts) likely to lead to lower rates of separate households forming. For a fixed level of occupied housing stock, more people imply a larger average household size and a reduction in the proportion of people who are a household reference person. So changes in the proportion of people who are a household reference person will likely at least partly reflect and adjust with population growth. However, over the longer run, an increase in housing supply would be expected to follow strong job growth and population growth in a region, assuming there are no constraints on building appropriate new supply.

A change in the age structure of the population is likely to be reflected in housing consumption patterns. The new approach to presenting the data allows for analysis of changes in household reference person rates by each five year age group (thus adjusting for the changed age structure). The difference in housing consumption in 2011 compared with 2001 is shown for Australia as a whole in Figure 3.4. Comparisons for each of the States and Territories will be published in the future. More recent changes in population distribution that differ from the projected distribution underpinning earlier estimates of underlying demand are likely to impact on the relative gap across the States and Territories.

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<sup>23</sup> See ABS (2013) *Australian Demographic Statistics, Dec 2012* feature article Final Rebasing of Australia's population estimates September quarter 2006 to June quarter 2011.

**Figure 3.4 Underlying demand for additional dwellings if housing consumption in 2011 was the same as in 2001, Australia (shortfall of occupied private dwellings), by age of household reference person (284,000 total additional dwellings)**



Source: NHSC calculations based on ABS Censuses of Population and Housing 2001, and 2011 and ERP for end-June 2011 from ABS *Australian Demographic Statistics, December Quarter 2012* cat no. 3101.0.

Note: The quantum for each age group represents the number of additional households (occupied dwellings) there would be for if the same proportion of that age group were recorded as a household reference person in 2011 as was the case in 2001.

Nationally, the decrease in the proportion of persons who were household reference people in 2011 compared with 2001 was mostly in the younger and older age groups<sup>24</sup>. That is, the likelihood of being the household reference person decreased most for the young and the old, meaning people in these age groups were more likely to be living with other people in 2011 than they were in 2001.

The period from 2001 to 2011 saw a dramatic change in the younger age group with the influx of several hundred thousand overseas students. Overseas students appear to have a quite different pattern of housing usage than the Australian-born groups dominant in the age group in 2001. The impacts of the likelihood of overseas students

<sup>24</sup> There may be a degree of volatility around the data at a more disaggregated level, particularly in the smaller States and Territories. The 2001 household reference rates were calculated from the one per cent Census sample and will therefore have a slightly wider margin of error than the 2011 data. In addition, the ABS is continually working to improve data collection techniques, so interpretation of guidelines may vary a little over time. The smaller the area looked at, the wider the margins of error are likely to be.

## NHSC 2013 State of Supply Report: Changes in how we live – Chapter 3: The housing gap

to be in group households and non-private housing would have been concentrated in this age group.<sup>25</sup>

As the Council first noted in 2011,<sup>26</sup> the increase in life expectancy at age 50, particularly for men,<sup>27</sup> means more spouses will be surviving, which decreases the proportion of older people living alone. Figure 3.4 also points to a relatively large number of additional dwellings that would have been required for those aged 40-44 years if 2001 housing consumption patterns applied in 2011. This may be due to declining rates of relationship breakdown. While only a proxy for the different types of relationship breakdown for people co-habiting, the divorce rate for those aged 40-44 years (the age group with the highest rate of divorce) was lower in 2011 than 2001, and the difference in rate was greater than for older age groups.<sup>28</sup> If this age group are more likely to live in a family household than the same age group a decade earlier, rather than as more than one household after a relationship dissolves, there would be comparatively fewer households, with a larger average household size and a lower likelihood of being the household reference person.

### Why change the approach for estimating the housing gap?

In the past, the Council has produced estimates and projections of a housing gap based on its assessments of the growth in *underlying* demand and of growth in the occupied housing stock. As *Housing Supply and Affordability Issues 2012-13*<sup>29</sup> explained in detail, some of the data (particularly for the estimated resident population) that underpins the Council's estimates of underlying demand has been recast. However, not all inputs into the models used by the Council have been, or will be, updated on a consistent basis.

The Council has previously estimated how many households would have formed if past household formation patterns continued, after adjusting for population growth and compositional (most importantly age structure) change — this is termed underlying demand. This estimate of underlying demand is then compared to net additional housing supply to quantify a housing gap or surplus).

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25 NHSC (2013) *Housing Supply and Affordability Issues 2012-13*. See p.34 Table 2.6 Living arrangements of persons aged 15-24 years and 25-34 years, by country of birth, 2001-2011, and p.69 for further discussion of living arrangements of overseas students and the 15 to 24 year age group.

26 NHSC (2011) *State of Supply Report 2011*, p.22.

27 Life expectancy at age 50 for men was another 29.9 years in 2001 and 32.0 years in 2011; for women it was 34.1 years in 2001 and 35.6 years in 2011. See ABS (2012) *Deaths, Australia, 2011* Cat no. 3302.0, Table 3.9 Life expectancy selected ages Australia 2001-2011.

28 Source: ABS 2012, *Marriages and Divorces, Australia, 2011* cat no. 3310.0. For males aged 40-44 the divorce rate fell from 13.3 (divorces per 1,000 ERP) in 2001 to 10.3 in 2011. For females it fell from 12.8 to 10.5.

29 See chapter 6 (pages 107-124) on *Housing Supply and Affordability Issues 2012-13*

One key input into the estimation of the housing gap is population growth. Following the results of the 2011 Census, the ABS revised the estimated resident population (ERP) for Australia down at June 2011. The ABS has also recast earlier estimates of the population back to 1991. A second key input is the likelihood of a given population to form separate households, which changes in response to available supply as, by definition, the number of households is equal to the number of occupied dwellings. These data are key inputs into the estimates of the number of households and changes in the Council's measure of underlying demand.

Briefly, the revisions to ERP and the flow-on impacts on other measures means that it is not possible to produce an updated assessment of underlying demand, and therefore of the supply gap or surplus, using the Council's previous method. Also it will not be practicable to produce a time series of underlying demand from 2001 to 2011 that is consistent with the revised ERP, and the ABS is not expected to produce revised household estimates.

The Council has devised the new approach for presenting the impact of these changes on estimates of the existence and size of any housing gap outlined in this chapter as a response to these data constraints.

## Conclusions

Changes to population estimates, and a range of challenges associated with sourcing comparable data to assess the balance between housing supply and underlying demand, have led the Council to develop a more transparent measure of the difference between underlying demand and the supply of housing. Past estimates have been dynamic (incorporating a level of change in the formation of new households that might be responding to supply constraints) and have required assumptions on what share of newly built homes leads to additional occupied stock. The current (static) estimates are based on housing consumption at a point in time and eliminate the need to make assumptions on the supply side. There are a number of benefits from the change:

- The new measure means the Council's estimates of a potential housing shortfall are no longer exposed to revisions to the historic population or earlier and out-dated household projections.
- While conceptually consistent with previous estimates, the new measure is more straight forward, with a fixed 'anchor point' of comparison. The housing gap in 2011 produced in this chapter for the 2001 Census housing consumption patterns indicates that there would be 284,000 additional occupied dwellings in 2011 in Australia if the population (as measured by age, and gender) lived as it did in 2001.

*NHSC 2013 State of Supply Report: Changes in how we live –*  
Chapter 3: The housing gap

- As the new measure does not allow for underlying demand to adapt and be influenced by more recent events between censuses it is not as useful for predicting potential future demand as the household projections previously used. However it avoids the inconsistent 'sliding base' of changing living arrangements for different periods. The previous method for estimating underlying demand was based on household forming from one set of probabilities from 2001 to 2006 and another from 2008 onward, with probabilities interpolated for the intervening period. In effect, underlying demand as measured for the housing shortfall estimate is now defined against a set of historic circumstances, rather than evolving over time as circumstances change.
- It eliminates uncertainty around supply side estimates. The Council has long noted the challenges in estimating net housing supply growth, particularly adjustments for demolitions and vacancies. The new method eliminates this problem at each census point as it looks solely at how households occupy the stock. Specifically, it focuses on occupied dwellings and is based on the assumption that the number of occupied dwellings and the number of households are equal.
- Under the new measure, unless new housing is occupied it does not add to supply. Occupied housing is presumably in a location where there is demand (with access to employment opportunities and services) and is therefore available and affordable to at least some households. This is an important point to bear in mind when looking at aggregate dwelling stock data. Although the absolute number of dwellings is greater than the number of households some households are still affected by a shortage of affordable, available housing. Adding more dwellings that are unaffordable and/or inaccessible to those households will have little direct impact on easing any housing shortfall. (See Table 3.7 for more detail.)
- Previously the Council has assessed the balance between housing supply and demand based on relatively old data from 2001 or 2006. The 2011 Census has provided an opportunity to reassess and has led the Council to the conclusion that many of the assumptions employed to generate previous estimates of the housing shortfall have been superseded by subsequent changes in housing consumption patterns.
- The new measure allows for more detailed analysis of where the changes in housing consumption patterns have occurred, both by age and by geography.

**Table 3.7 Change in housing measures between 2006 and 2011**

	Underlying demand (2001 base)	Underlying demand (2006 base)	NHSC estimated households	Gross completions	Net completions	Unoccupied dwellings	%
2006	7,555,000	7,367,000	7,367,000	na	na	830,376	10.4
2011	8,347,000	8,140,000	8,063,000	na	na	934,470	10.7
change	792,000	773,000	696,000	746,000	679,000	104,094	0.3
% change	10.5	10.5	9.4	na	na	12.5	na

Source: NHSC calculations based on ABS Censuses of Population and Housing 1991, 2001, 2006 and 2011 and ABS *Australian Demographic Statistics, September Quarter 2012* cat no. 3101.0. ABS 2013, *Building Activity, Australia*, cat no 8752. ABS Census *Quickstats*, Australia.

Note: Completions (net and gross) are the sum of September quarter 2006 to June quarter 2011 inclusive. Net completions are adjusted for demolitions (8.4 per cent) and vacancies (5.9 per cent) based on previous Council estimates.

The key point from the analysis is that housing circumstances changed significantly between 2001 and 2011, and were also different from those seen in 1991. 2001 looks to have been the peak for how households occupied the dwelling stock, as defined by how many households there were relative to the age-adjusted population. This measure also ‘deteriorated’ from 1991 to 2011, though not to the same extent as from 2001 to 2011.

This raises a question about the impact of choosing 2001 as a point of equilibrium. Previous work by the Council has suggested that varying this starting point a few years either side of 2001 for each jurisdiction did not have a great impact on the aggregate housing shortfall. However, that analysis was based on annual changes in underlying demand evolving in line with long-term trends — effectively the annual changes (such as the household formation propensities) in underlying demand were constant while a different starting year was picked. With the new measure, choosing a new starting point (for example 1991) means identifying a different comparison base year.

As with any benchmark, if comparison is made with a high point, subsequent situations are more likely to appear worse. However, there are some factors such as rising incomes and overall standards of living that might be expected to keep the rate of formation of separate households at high levels compared to the past, or even result in a trend increase in the formation rate. Alternatively, it may be that, as finite resources start to constrain housing production in the most desirable areas (as appears the case in parts of capital cities) then the fall off will be sustained.

In short, Australians’ rate of housing consumption has declined since 2001, as evidenced by the turn-around in household size. This means larger households despite a decline in the number of families with children and the average number of children per family, as well as fewer dwellings and households per head of

*NHSC 2013 State of Supply Report: Changes in how we live –  
Chapter 3: The housing gap*

population. There are several possible and potentially overlapping explanations for this.

One explanation lies in the fact that the supply and price of housing constrain demand. Increases in demand take time to be perceived, evaluated as viable business opportunities, and met by the development and construction industries. Their response to changes in demand may be assisted or limited by access to investment finance, by planning and development approval arrangements as well as by the type, extent and method of financing additional infrastructure. New households cannot form unless they can obtain a dwelling. Accordingly, household formation rates will almost certainly decline while average household size increases in periods of higher than expected population growth.

Higher housing costs relative to income and falling home ownership rates both point to a lack of available and affordable housing as a contributing factor to the decline. Some of the difference may be explained by other factors, by no means all negative. However, it appears that the supply of accessible new dwellings in areas where people want to live that are connected to places of work has not kept up with the previous levels.

Migration can also affect the nature of housing consumption though changes in settlement patterns and financial capacity arising from shifts in the balance between restricted and permanent categories, and in migrants' education, skills and financial position.

The analysis by age profile highlights where the change has been most acute. There has been a disproportionate decline in the share of household reference persons aged between 15-24 years, which may reflect a larger share of young adults remaining in education and living in the parental home for longer. The phenomenon of younger adults being less likely than in the past to form independent households requiring separate accommodation probably derives from a mix of generational change in lifestyle preferences and financial constraint. Some of the change among older Australians reflects longer life expectancy for both members of a couple and fewer older people being widowed, meaning that average household size increases (and the share recorded as household reference persons declines).

The aggregate analysis shows where housing circumstances have changed and, to a limited extent, whom they have affected. What it cannot distinguish at this stage is how much of the change has been driven by financial constraints, specifically higher housing costs to which a lack of available dwellings may have contributed, and how much is due to a change in preferences and broader social and economic trends.

For the National Housing Supply Council, and for producers, consumers and governments, the most important question arising from changes in housing consumption patterns is the extent to which they result from free choice and an efficient housing market supplemented by effective housing assistance programs, or



from remediable deficiencies in policies and processes that diminish the supply and increase the price of the housing that Australians want and need.

## Future work

While it is not practicable to analyse the years between censuses, the Council is exploring options for producing reliable annual updates. Annual updates will still involve using building completion data to estimate net dwelling additions and comparing this with estimates of underlying demand. Some of the analysis around underlying demand and the estimates of net housing supply can be updated with census information.

The 2011 Census has provided the Council with an opportunity to reassess its estimates of net housing supply growth. This reassessment will include recalibrating demolitions and vacancy rates with more recent, and hopefully more reliable, data. Data on total dwelling counts are yet to be released by the ABS from its follow-up work around the Census, but will form a crucial building block for the estimates.

These possible approaches will not produce a housing gap estimate that can simply be added to the estimates in this chapter. Each census marks a new starting point for assessing the balance as it shows how the housing stock and the population are reconciled at that point in time.

In this report, the balance between underlying demand and supply is assessed by applying a static standard (housing consumption rates at a previous point in time) and comparing this with what actually eventuated at a later point.

The Council is developing projections of the number and type of future households that will provide a measure of underlying demand to inform assessment of future dwelling production requirements. These projections of the number of households, from 2011, are based on changes to living arrangements seen between 2006 and 2011. They are not constrained to the occupied stock and thus cannot be added to the existing census-based stock figure.

Another stream of future work may be more detailed examination of local markets, incorporating how housing circumstances have changed and comparing this to changes in housing costs and vacancies. This could include examining the drivers of change in tenure and the obstacles to affordable home ownership and affordable rental.

Finally, the Council may look to extend the analysis of underlying demand beyond the simple patterns of housing consumption examined here. This may include investigating the impact of other explanatory factors in housing consumption patterns

NHSC 2013 *State of Supply Report: Changes in how we live* –  
Chapter 3: The housing gap

such as how long a person has lived in Australia,<sup>30</sup> the balance between living in a capital city against living elsewhere in a state, access to services and infrastructure, and specific economic drivers such as the changing fortunes and impact of the resources sector on the level and geographic distribution of housing demand and supply.

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<sup>30</sup> See NHSC (2013) *Housing Supply and Affordability Issues 2012-13*, p. 68 -73 for discussion of impacts on housing consumption of length of time living in Australia.